Connecting Secondary Departments with National Reforms: The Role of the Chair

Wayne Melville
Lakehead University, Canada

Jeremy Peacock
Northeast Georgia Regional Education Service Agency, USA

Abstract

This article draws together Narrative Positioning Analysis and a Bourdieuian perspective to investigate the relationship between the position of the chair, their disposition towards reforms, and the impact on departmental learning. Our analysis indicates two major conclusions. First, there is a disconnect between chairs' leadership dispositions and the logics of reform practice. Second, chairs are constrained in their capacity to shape leadership dispositions towards reforms in a manner that challenges departmental logics of practice. A key implication of this is that it may be politically easier for a chair to argue for superficial issues rather than substantive reform.

Keywords: Bourdieu; Department Chair; Instructional Leadership; Narrative Positioning Analysis.

Please address all correspondence to: Dr. Wayne Melville, Faculty of Education, Lakehead University, 955 Oliver Road, Thunder Bay, ON, Canada, P7B 5E1. Phone: 1 807 766 7194
Email: wmelvill@lakeheadu.ca

Introduction

Implementing the reforms laid out in the *Next Generation Science Standards (NGSS)* (NGSS Lead States, 2013) will require significant shifts in teacher practice within high school science classrooms. As science teachers negotiate this ongoing national reform and the ever-shifting context of science education, leadership aimed at maximizing the quality of instruction and student learning is critical. Traditionally, studies in leadership have been focused at the whole school level, but there is increasing literature indicating that it is the leadership at the secondary school department level that is critical in the linking of wider reform efforts to changes in teacher's instructional practices. In linking the department to the successful implementation of wider reforms, Brundrett and Terrell (2004, p. 10), stress the importance of the instructional leadership of the department chair:

> *National and local government … may set the agenda … but this can only be enacted successfully if those who work with children on a day-to-day, minute-by-minute basis are informed, consulted and empowered to do so. … middle managers are the glue that holds together schools since they are frequently the ones to turn policy into action.*

Referring specifically to school science departments, science teachers are strongly socialized into the meanings and practices that the department attaches to the teaching and learning of science (Melville & Wallace, 2007). Chairs have a responsibility to shape those meanings and practices, and have been shown to be the crucial connection between the department and wider reforms (Melville, Hardy & Bartley, 2011). The case remains, however, that the leadership practices of

chairs are not well understood, and chairs are underused as a resource for improving instruction (Weller, 2001).

While researchers regularly argue that chairs are in prime position to provide instructional leadership within their departments, research paints a portrait of the chair as a professional who is asked to do too much, in too little time, and with too few resources (c.f. Mayers & Zepeda, 2002; Zepeda & Kruskamp, 2007). In this article, we seek to use data from an intensive study into the leadership practices of chairs in the southeastern United States (Peacock, 2013) to address the issue of how chairs can more effectively link their leadership role to the wider press for science education reform as outlined in the *NGSS.* In using this data, we seek to unite two lines of previous research on the leadership of chairs. The first author has applied narrative positioning analysis to understand the instructional leadership practice of exemplary chairs in the southeastern United States. The second author has drawn extensively on a Bourdieuian perspective to consider the role of the chair in establishing the conditions under which instructional leadership can act as a catalyst for, and ongoing supporter of, contested reforms such as those promoted by the *NGSS.* A Bourdieuian perspective gives us insights into the conflicting demands placed on chairs by calls for reform, and how their responses contribute to contested practices in, and across, their classrooms, departments and the national reforms. These understandings, we believe, are complimentary and their intersection may provide a fruitful area for further research on the work of chairs.

The research question that arises from the intersection of our work, and which has guided our analysis, is to ask "to what extent do science department chairs" narratives of instructional leadership practice reflect the requirements for leading reform that have been previously identified from a Bourdieuian perspective?'

This article is laid out in five sections. This first section provides a brief literature review on the leadership role of the chair, and their capacity to link wider reforms to the teaching and learning in their departments. The second section provides an overview of the conceptual frameworks that we have used to analyze the data. The third section presents the methodologies and methods that have been used in our work. From the collected data, the fourth section presents our findings, using four studies that exemplify each of the four leadership positions developed from the analysis. The fifth section provides a discussion of the analyses, while the sixth section outlines the implications of our work for the work of chairs.

Conceptual Frameworks

This section outlines how we are seeking to use the intersection of Narrative Positioning Analysis and a Bourdieuian perspective on the work of chairs in order to understand how movements between different leadership positions can impact the capacity of the chair to initially link, and then actualize, the *NGSS* reforms into the work of the teachers in their departments.

Narrative Positioning Analysis

Role theory, under which the social behaviour of an individual tends to conform to pre-existing roles that are determined by social context, has dominated social psychology for much of the past century and heavily influenced research into the leadership role of chairs. Peacock (2013) argues that positioning analysis, as first explicated by Davies, Harré, and van Langenhove (Davies & Harré, 1990; Harré & van Langenhove, 1999; van Langenhove & Harré, 1999) and applied to narrative interview research by Bamberg (1997, 2003, 2006, 2011), represents a more appropriate methodology for understanding the leadership stances adopted by chairs. More specifically, Peacock argues, paying greater attention to positioning within professional narratives can illuminate the emergence of professional identities and the production of new knowledge of professional practice.

In 1990 Davies and Harré presented the concept of positioning as an alternative to role theory in the constitution of identity. In contrast to the static view of role theory, positioning draws on post-structural thought and discursive practice to produce a view of identity as flexible and emerging through dynamic social discourse (Davies & Harré, 1990; Harré & van Langenhove, 1999). For Davies and Harré (1990) discourse allows individuals to make sense of both their own, and others, social actions. Positioning, therefore "is the discursive process whereby selves are located in conversations as observably and subjectively coherent participants in jointly produced story lines" (Davies & Harré, 1990, p. 48). Thus, individual teacher identities are not fixed entities that engage in discourse and other social interactions; rather, teacher identities are constituted through these interactions.

According to Davies and Harré (1990), participants in a discourse may position themselves, or others, in the discourse, and participants may make use of culturally familiar subject positions. These positions are analogous to roles, but are more flexible, mediated by personal experience, and may include transient, contextual positions. Participants' identities are constituted as they accept, refuse, or modify positions within a discourse. Rather than focusing on the defining effects that pre-existing roles have on discourse, positioning analysis focuses "on the way in which the discursive practices constitute the speakers and hearers in certain ways and yet at the same time [serve as] a resource through which speakers and hearers can negotiate new positions" (Davies & Harré, 1990, p. 62). Harré and van Langenhove (1999) extended the concept of positioning by defining positions in terms of shifting moral orders that provide speakers with certain rights and responsibilities within the discourse. These moral positions represent locations within a larger social order and within the local discourse, and can be viewed as "powerful or powerless, confident or apologetic, dominant or submissive, definitive or tentative, authorized or unauthorized, and so on" (van Langenhove & Harré, 1999, p. 17). Further, any deviation from concurrently accepted positions requires an individual to account for the deviation before successfully moving to a new position.

Combining Davies and Harré's (1990) concept of discursive positioning with a Labovian (Labov & Waletzky, 1967/1997) structural approach to narrative analysis, Bamberg (1997) attempted to unite structural and pragmatic approaches to narrative inquiry. To this end, Bamberg

(1997) worked from the position that narratives represent past events, while also revealing what these past events mean to the narrator within a co-constructed social interaction. Further, Bamberg (1997, 2003) recognizes that narratives are situated actions with multiple functions within an interactive setting. Rather than simply revealing underlying identities or realities, narratives carry the capacity to produce a certain version of reality through interaction. Bamberg's (1997) linking of discursive positioning and a structural analysis of narratives, also opens the focus of positioning analysis from personal conversations to research interviews. Thus, individuals constitute their identity as they narrate, and position, themselves within a story that is co-constructed with an interviewer, or other participants, in a discursive interaction. One part of this discursive identity is the position that they adopt towards reforms promulgated from outside the department.

Bourdieu and the Chair

The work of the chair in connecting the department to reforms is not an individualistic exercise, for departments are concurrently communities and organisations (Melville & Wallace, 2007). Within the community aspect, chairs develop strong personal and professional relationships with their teachers, and "through these connections shape and reshape their own teaching - and bring it into line with local practice" (Bush, 1997, p. 95). Chairs' practices are, therefore, heavily influenced by their individual and collective settings and experiences, although this is problematic if "uniformity is valued over diversity" (Eick, 2009, p. 138). The strong relationships found in departments underpin the work of the chair in leading the department as an organization that has the power to "promote access to professional learning, maintain accountability to their standards of teaching and learning and encourage teacher leadership" (Melville & Wallace, 2007, p. 1204).

The foundational nature of relationships in the work of departments also allows them to be considered in terms of social space, or social "field" (Bourdieu, 1990; 1998). Fields are specific social environments "with explicit and specific rules, strictly delimited in extra-ordinary time and space" (Bourdieu, 1990, p. 67). The notion of fields also points to the structuring effects of practices within these identifiable social spaces, as well as the relative autonomy they possess. As relational constructs, fields are made up of individuals (reflecting particular "positions") who share a common belief, engage in similar practices, and openly compete for the symbolic and material products, or "capitals", of greatest value, with an eye to accumulating those "capitals" (Bourdieu 1984; 1985). Analytically, the value of the notion of the field is that it provides a means for understanding the relationships among objects, concepts and people, and the manner in which learning cultures develop, work and change (Hodkinson, Biesta & James, 2008).

In connecting the department to reforms such as the *NGSS*, we are conceptualizing the wider reforms as another field which itself is contested as it seeks to respond to curriculum and administrative pressures and the wider societal pressures to address the crisis in science education (Tytler, 2007). The focus of this article is whether and how a chair, operating within these conceptualizations of the department, is able to promote reforms to the teaching and learning of science within the department. In particular, we are interested in how the chair can act to align the field (or social space) of their department with more inquiry-focused logics within the reform field of science education**.** Operating within the larger field of reform, the departmental valuing of

particular practices over the practices promoted by the reform clearly creates a potential "space of conflict and competition" (Bourdieu & Wacquant, 1992, p. 17). Leadership within a department, then, requires chairs to operate across both the department and reform fields and their different "power structures, hierarchies of influence, and logics of practice" (Lingard & Christie 2003, p. 320).

Bourdieau (1984, p. 169), proposes that individuals, such as chairs, "have points of view on this objective space which depend on their position within it and in which their will to transform or conserve it is often expressed." Thus, the capacity of a chair to operate across these fields requires an understanding of the logics that characterize the fields, and an ability to change practice through a process of active reflection and leadership repositioning. In seeking to understand how change can occur within a field, Bloomer and Hodkinson (2000) developed the notion of a learner's dispositions toward the learning opportunities with which they are presented. These dispositions, or habitus (Bordieau, 1984), are central to our analysis. Hardy (2009, p. 511) states that an individual's habitus:

> is the product of a long apprenticeship into particular practices, resulting in specific, durable qualities. Such qualities are a product of the accumulation of varied resources, or "capitals", which individuals and groups build up over time, and upon which they can derive particular advantages under circumstances in which those attributes are valued.

This article considers how chairs' dispositions to reforms influences the narrative positioning that they adopt in regard to their instructional leadership practices. Over the past fifteen years there has been an increasing focus on the dispositions that teachers bring to their work, and the connections between those dispositions and identity. Mullin (2003, p. 5) has described teacher dispositions as "dimensions of human personality that have a consistency about them and are characterized, exemplified, or typified in behavior patterns." It is important to understand how chairs, through discursive practices, position themselves in relation to the press for reform. For it is through this positioning that chairs, and their departments, can build the:

> knowledge and skills that teachers and other staff need in order to accomplish organisational goals but also the dispositions (commitment, capacity and resilience) to persist in applying the knowledge and skills ... [and] integrate the functional and the personal (Leithwood, Harris & Hopkins, 2008, p. 30).

Methodologies and Methods

The original collection of data that are being interrogated here was carried out as part of a larger mixed-methods study that sought to understand, and inform, the professional practice of high school science department chairs in the role of instructional leadership (Peacock, 2013). Data were collected using an online, descriptive questionnaire of instructional leadership contexts and practices of public high school science department chairs in Georgia. In this section our intention is to outline the data collection and comparative positioning analysis processes that provided the data that were analyzed from a Bourdieuian perspective.

Questionnaire Existing literature on department chairs and instructional leadership informed the content and construction of the questionnaire, which sought to probe how chairs work within their particular school contexts to enact instructional leadership in science. Items related to chairs' role in instructional decision making and chairs' ideal image of their role were adapted from Adduci, Woods-Houston, and Webb's (1990) interview study of chairs' role ambiguity and role strain. A set of Likert-type items in which chairs rated the relative importance of various instructional leadership practices included practices reported in 16 further studies of the role(s) of the chair. Beyond these specific studies, items addressing school context, factors supporting and limiting instructional leadership, and chair demographics were influenced by themes identified in an extensive historical review of the literature on the high school department chair (Peacock, 2014).

Building on previously noted suggestions that department chair research should incorporate narrative and other qualitative methods that account for the contextual and social nature of chairs' practice, the questionnaire incorporated opportunities for participants to provide open-ended accounts of their instructional leadership practice. The goals of these items were to elicit more detailed information from respondents and to provide space for responses that may not be captured in forced answer choices. These open-response items were paired with forced- response items addressing the same concepts and were placed first in these pairs to lessen the influence that forced-response choices might have had on open responses. As completed, the questionnaire included 36 selected- or open-response items addressing school context, teaching assignments, roles and responsibilities, compensation, release time, involvement in instructional decision making, instructional leadership practices, supporting and limiting factors, chairs' path to the position, and demographics.

Participants and a Limitation

The questionnaire targeted science department chairs at public high schools in Georgia. Departments headed by chairs were identified from the National Center for Education Statistics (2011) online database, and the online questionnaire was distributed by email to 369 department chairs at 355 schools throughout the state. The discrepancy is due to a number of schools possessing co-chairs. A total of 146 chairs completed the questionnaire, and the initial analysis showed a median 17 years teaching experience and five years' experience as chairs. Respondents led departments that ranged from 2 to 35 teachers with a median of nine teachers. Although respondents generally taught multiple grade- and course-levels, chairs were more likely to teach upper grades and higher-level courses. Sixty-six percent (66%) of respondents reported teaching 11th grade and 74% taught 12th grade. Chairs were most likely (87%) to teach advanced-level course, while only 30% of chairs reported teaching remedial or special education classes.

At this point, we believe it prudent to highlight that the questionnaire may over-represent the role of instructional leadership in the typical chair's daily activities. A majority of the participants indicated that student learning (74%) and school leadership (77%) motivated their desire to become chairs, consequently, this sample may possess a greater focus on instructional leadership than the general population. This is consistent with the goal of informing both the practice of chairs

who seek to enact instructional leadership for the purpose of improving science education and policies of school and district leaders who seek to foster chair leadership.

Data Analysis and Representation

As part of the larger study (Peacock, 2013), selected items were analyzed quantitatively through descriptive statistics to provide a broad view of science department chairs and their instructional leadership practices. Within this broad view, qualitative items were analyzed through the constant comparative method (Charmaz, 2006), with the goal of developing a visual conceptual model (Maxwell, 2005). Through three iterations of coding, individual units of meaning were synthesized into larger segments of data, which were then compared to the research literature-based practices that were incorporated into the questionnaire. Where these larger segments of data were supported by the literature, these codes were used to generate conceptual categories that connected the data to the emerging conceptual model (Charmaz, 2006). After reviewing the descriptive notes for the underlying codes, narrative explanations were developed for the conceptual categories. One of these categories developed from the comparative analysis revealed that chairs' instructional leadership practices could be classified as one of four types: chair as liaison, informal shared leadership, formal shared leadership, or chair as autonomous leader. Each of these four types provides insights into how charWorking with these classifications, interviews were conducted with 12 exemplary science chairs (nominated by their colleagues) to develop a richer understanding of each type. Four of those interviews are utilized in this article, each one representative of the leadership practices that are the focus of the narrative analysis.

Narrative Analysis

The interpretation of the chairs' narratives of instructional leadership practice was based on the analysis of narratives strategy described by Polkinghorne (1995). Using this strategy, the narratives are interrogated using "concepts derived from previous theory or logical possibilities and are applied to the data to determine whether instances of these concepts are to be found" (p. 13). For this paper, we were particularly interested in applying concepts of chair leadership developed in earlier work (Melville et al., 2011). These concepts, developed from a Bourdieuian perspective, indicated that departmental and reformed practice can move towards congruency when, firstly, the chair develops a credible reform-minded habitus, as this appears to be foundational to the capital that can be expended in the leadership of reform. The second is an understanding of how to wield power and position in the promotion of reform. The third is the capacity to operate simultaneously and strategically within, and across, the two fields. This involves downplaying administrative logics, and foregrounding more inquiry-focused logics as a vehicle to challenge traditional science teaching dispositions – the latter being typically dominated by concerns about curriculum coverage.

Findings: Positioning Chairs

Two key findings from the original comparative positioning analysis (Peacock, 2013) are relevant to the analysis presented here. The first finding was that chairs' particular school contexts shaped their positioning as instructional leaders. In particular, chairs' positioning within the school leadership hierarchy constrained their leadership approaches. In line with this finding, the

comparative analysis revealed that chairs' leadership approaches could be classified as one of four types: chair as liaison, informal shared leadership, formal shared leadership, or chair as autonomous leader. Three chairs in the study positioned themselves primarily as liaisons who enacted leadership by implementing administrative initiatives within their departments. A second set of chairs negotiated greater standing within their school leadership hierarchy, even in the absence of formal shared leadership structures. These chairs moved beyond the liaison role to exert more active influence on instructional practices within their departments. A third set of chairs worked within school structures that formalized a distributed form of school leadership that provided the chairs with direct access to school-wide decision-making processes. A final set of chairs enjoyed some level of autonomy from school-level management in leading their departments.

The second finding was that administrative initiatives driven by general education reforms also exerted a strong influence on chairs' positioning within leadership narratives. As a result, chairs generally positioned their leadership within discourses of assessment, accountability, and general school improvement measures and not within the discourse of science education. University science education faculty, district science supervisors, or a university science education program coordinator recommended the chairs for the study. Even so, these chairs did not position their leadership practice in a way that would support science education reforms such as those recommended by the *NGSS*.

While chairs represent an important potential resource for supporting curriculum reforms in science education, the findings of the study indicated that many chairs are seriously constrained in their ability to fulfill this potential. The current analysis applied the Bourdieuian framework outlined above to examine more closely the limitations faced by chairs in the interview study in their ability to support science education reforms. To accomplish this, the authors selected a representative vignette from a chair associated with each of the leadership positions revealed in the interview study and analyzed whether the vignette indicated the chair was able to meet each of the three Bourdieuian considerations required for chairs seeking to explicitly connect professional learning in their department to the wider reform efforts in science education. We present the findings of this analysis below.

In the following vignettes, the words of the chairs have been italicized, and pseudonyms have been used for all participants.

Chair as Liaison: Brad Johnson

In his narratives, Brad positioned himself as a liaison whose primary responsibility was to "*push the administrator's agenda"* within his department. Brad reported various efforts to reform instruction within his department, but these efforts were general in nature (e.g. supporting instruction through managerial duties and mentoring new teachers) rather than being specific to science education reforms. Only in response to a follow-up email that specifically probed chairs' efforts to support science education reforms did Brad provide the following vignette:

> *There was a big push in the district for teaching science with inquiry. I was pretty excited about the possibilities [and] initiated a program in which a group of teachers would go through the curriculum and identify specific ways to infuse inquiry-based strategies into the district curriculum. The group worked very hard trying new things, planning activities and discussing outcomes. Ultimately, it all fizzled. Administrators and teachers ultimately didn't buy in to the effort. I have come to believe that good standardized test scores are really all that matter to the bureaucracy. If the test scores in the paper look good to the public, initiatives from the grassroots aren't going anywhere; even when they would be good for students.*

Viewing this vignette in light of the three conditions drawn from Bourdieu's work helped explain why Brad's efforts ultimately *"fizzled"*. First, Brad's dispositions to the reforms appeared to have been tenuous at best, and at no point did he indicate a deep understanding of the reforms. While Brad viewed the inquiry initiative positively, he had not initiated the change. Rather, the initiative came as a "push" from the district, likely in response a perceived educational fad and not in a meaningful attempt to meet the goals of earlier reform documents, such as the *National Science Education Standards* (National Research Council, 1996). Brad did not display a long-term commitment to inquiry-based science teaching. In fact, Brad indicates that, as a result of this and other negative reform experiences, he would act in the future to shield his teachers from reform efforts. Thus, any disposition toward science education reforms was replaced by a disposition toward the status quo. Second, Brad appeared to lack real power (or influence) to challenge the teachers' and administrators' dispositions towards the reform of science teaching. Two points are important here: the first being that Brad's position is consistent with his positioning as an implementer of administrative initiatives, rather than as a instructional leader. The second reason is that, to challenge the status quo, requires power and influence to be wielded for considerable lengths of time: Brad's one year is too short a time to be credible and to have a lasting impact. Finally, the strategy that Brad implemented to drive the district's agenda indicates a limited capacity to work across the departmental and reform fields. Without a strong disposition towards the reforms, the decision to *"go through the curriculum and identify specific ways to infuse inquiry"*, indicates an incapacity to model the reform over the long-term and hence demonstrate *why* the reform is important to teachers. Finally, it is interesting to note that Brad had recently completed a doctoral degree in science education. One might expect that this experience would help shape Brad's dispositions towards connecting the departmental field with the larger field of science education. However, Brad's lack of power and influence within the school hierarchy, and a lack of the cultural and political capital necessary to influence the teachers in his department, appears to have defeated his original intentions.

Informal Shared Leadership: Charles Clark

Charles held some formal authority within his department by virtue of his school-mandated responsibility to conduct performance evaluations for his teachers. However, two forces undermined the social and political capital that Charles might have drawn from the authority inherent in his position. First, Charles had been elected as the chair and enjoyed little support from his school administration. Secondly, as Charles discussed in the vignette, the poorly designed

evaluation system did not encourage sustained professional learning among teachers. Positive ratings were perceived as doing well, while negative ratings were perceived as punitive, and not the responsibility of the teacher. Thus, Charles characterized his situation as a "political" one in which he constantly sought a balance between influencing and alienating his teachers. Charles' disposition toward science instruction was also problematic: the specific issues that Charles pursued with the department were laboratory and chemical safety and student participation in science fair competitions. These are important issues, but are indicative of a concern for administrative logics rather than systemic reform of science education. In fact, Charles indicated in his email follow-up that he viewed the *NGSS* primarily in terms of curriculum coverage: *"We will need to rework our curriculum maps…".*

While Charles found himself in a tenuous leadership position, he did discuss several examples of his efforts to support instructional improvement within his department. In the following vignette, Charles discussed an attempt to introduce teachers to a series of Board-mandated content literacy strategies.

> *I'm going to target the ones who are struggling. Now, you have to be very subtle because I don't have any ability to make anybody do anything. I can give [poor ratings] now and then, but it's just punishment; it's not designed very well. They will just say, "We don't want you anymore". As I've been trained in the reading across the content area, I can take some of those strategies and say "Hey, let me show you this". I'll just show it to them and then they try it, and they'll talk about and say, "Well, this was the problem". Let's think through that … what I'm doing is trying to do is repair the places that I think need repair, while they will try the strategy, and then forget about it.*

Charles lamented that he was constrained by *"a top-down approach from the central office"* in which his district administration mandated a series of general education initiatives, such as content area literacy and common assessment. Such initiatives, combined with his limited disposition to science education reform and inability to effectively wield power prevented Charles from establishing the conditions that would support substantive science education reform in his department.

Formal Shared Leadership: Kim Smits

In contrast to Charles' tenuous positioning, Kim occupied a more certain position within her school leadership hierarchy as a result of her service on the school leadership team. That team focused primarily on making school-wide decisions based on student assessment data. As a result, Kim took an active leadership role within her school and department, although Kim's leadership was closely aligned to the goals of the leadership team rather than to science education reforms. As Kim's vignette highlights, she did dedicate some attention to science education reform efforts. Kim's focus on science education aligned with the fact that Kim's school had initiated a STEM (Science, Technology, Engineering, and Mathematics) academy within the school, and the fact that Kim's district science coordinator provided active support for science teachers.

> *As part of the STEM academy I have been working to increase inquiry-based learning, depth of content knowledge, and reading and writing across the curriculum. The purpose is to get students to develop a deeper understanding of content material and to be able to communicate and apply those ideas to other areas. The NGSS will definitely add to the supporting framework to help all teachers improve mastery of standards, even if they are not in the labeled STEM courses. We will use the NGSS standards to provide an additional framework in conjunction with the Common Core standards.*

While Kim seems to exhibit a disposition toward specific science education reforms, including STEM and inquiry-based learning, there appears to be a disconnect between Kim's stated intentions and the vision of science education expounded by documents such as the NGSS. Two factors appear to be at play in this apparent disconnect. First, Kim appears to be approaching reforms in a somewhat mechanistic way: *"We will use the NGSS standards to provide …"* The *NGSS* appear to be seen as a supporting checklist for what students should be able to do to meet the Common Core standards, not as a document that needs to be worked with in order to develop the practices of science. Second, Kim appears unwilling to really challenge the hegemonic view of science. Kim derives much of her capital from her position on the school leadership team, but much of that capital must also be expended in meeting the goals of the school. The foci of the leadership team are assessment and data-based instructional interventions, not on science education and inquiry. Consequently, Kim mounts little challenge to deeply held views of science teaching, and the department remains on the periphery of science education reforms.

Chair as Autonomous Leader: Melanie Dortman

Melanie described her administration as supportive and indicated that *"nobody gets in our way much".* Hence, Melanie was left to act somewhat autonomously in her department. Within this power structure, Melanie gave authority to her teachers to pursue their own particular agendas. Melanie led some of this innovation, and one outcome of departmental collaboration was the formation of a STEM academy within the school. In the following vignette, Melanie took the primary leadership role for the physical science courses in her department and relied on another teacher to lead in the life sciences.

> *I went to one of the STEM programs that help with resources, and I started a robotics team as I'm trying to get an engineering design course this year. I'll be teaching that and going to camp with some of my students. We're also going to learn engineering design processes… the other teacher is doing something similar, but he wants to do more project-based teaching within biology, and so a few years ago we started a math-science academy. It is supposed to be a capstone project at the end, but we haven't been allowed the time for them to work on this.*

Melanie was intentional and wielded influence in support of instructional improvements, but her efforts do not represent a specific commitment to the broad inquiry-based reforms promulgated by documents such as the *NGSS.* Melanie's delegation of authority did encourage a superficial level of reform, however, there was no overarching coherence to the practices that were developed.

Teachers were free to hold diverse interpretations as to the meanings of their work, with the result that while both STEM education and project-based learning are both reforms, they do not appear to have been implemented in a manner that is fully consistent with the *NGSS.*

Discussion

This article investigates the leadership positioning of chairs, revealing that their instructional leadership practice was shaped by local context, history, and competing reform efforts (Peacock, 2013). Further, each of the chairs faced serious limitations in their ability to connect departments to wider reforms such as the *NGSS*. We now turn our attention to the relationship between a chair's leadership position, their disposition towards reforms, and the impact on the learning of the department. A Bourdieuian analysis of the chairs' leadership positions, and their dispositions towards the reforms, provides insights into those limitations in terms of differences between the logics of practice and the impact of power on the relationships between the fields of school, department and reform.

Logics of Practice

Bourdieu viewed society as being composed of overlapping fields, each with a level of autonomy and particular logics of practice. These logics are stable over time, and are enacted by individuals and groups as a result of socialization into the particular practices of the field (Bourdieu & Wacquant, 1992). The limits of a field can be construed as the demarcation, or boundary, beyond which the logics have no impact on practice. In reality, this demarcation is not always clear-cut and will be blurred when similar fields overlap. The awareness of aspects of the reforms by the chairs in this article (for example, Kim was intent on increasing *"inquiry-based learning"*) is indicative of the blurred demarcation between science teaching and the wider reform of science education explicated by the *NGSS.* The limited responses of the chairs to the reforms appears indicative of some overlap in logics, but more powerfully of a general incongruence between departmental logics of practice and the reform logics. Those reform logics may be summarized as:

> expanding and enriching the teaching and learning of science. Notice the emphasis on teaching strategies aligned with science practices. When students engage in scientific practices, activities become the basis for learning about experiments, data and evidence, social discourse, models and tools, and mathematics and for developing the ability to evaluate knowledge claims, conduct empirical investigations, and develop explanations (Bybee, 2011, p. 13).

Each of the chairs' leadership positions within their departments appears to dispose them to a traditional concern for the teaching and learning of science as content. From Charles' *"We will need to rework our curriculum maps…"* to Kim's *"develop a deeper understanding of content material"*, the data is suggestive of chairs and departments who are heavily invested in the status quo of a vision of science teaching that promotes and secures "the prestige and power of science; it is an education not only *in* science, but also *for* science" (Carlone 2003, p. 310), emphasis in original). This is not a personal criticism of the chairs, it is a comment on the hegemony of the contemporary discourse in science education (Melville & Bartley, 2013) and how departments are powerful determinants of "what and how teachers teach" (Siskin, 1994, p. 5). Each of the four chairs in this article made an attempt to engage with the reform logics, but none appears to grasp the opportunity to use the reforms to seriously challenge their departments' logics of practice. The

crucial point here is that all of the chairs' dispositions to the reforms were limited in scope, and none sought to invest capital in developing a credible personal understanding of the reform logics of practice.

Teacher professional learning requires teacher learning to occur with the context of teachers' practice (Randi & Zeichner, 2004). If the chair, with the influence and power that the role possesses, is not disposed towards the reforms, then it would seem unlikely that other teachers will possess the capital to influence their colleagues (c.f. Melville & Bartley, 2013). As a consequence, the four chairs stayed on the peripheries of the reforms; Brad sought to *"infuse"* inquiry into extant practice, while Melanie encouraged a teacher "*to do more project-based teaching"*. Confirming earlier work (Melville et al., 2011), the implication for chairs is this: to lead reform in their departments, they will need to develop an understanding of reform logics, and as learners, need to "perceive the same opportunities differently, and react to them differently, because of their different dispositions" (Hodkinson & Hodkinson, 2004, p. 176).

The apparent disconnect between the chairs' leadership dispositions and the logics of reform practice helps to explain why reform efforts "have left relatively undisturbed the major narrative of the science curriculum that focuses on the establishment of a body of knowledge that is assessed largely by declarative means" (Tytler, 2007, p. 3). The question then arises as to the capacity of the chair to shape their leadership dispositions towards the reforms in a manner that challenges the departmental logics of practice. This is a question of power.

Power

Bourdieu recognized a hierarchy in the relationships between fields, with the "fields of power and the economy sitting in a superordinate relationship to other quasi-autonomous fields" (Lingard & Christie, 2003, p. 323). Delineating departments as semi-autonomous fields within the fields of the school (which itself may be considered a semi-autonomous field within the district), and the wider field of science education reform, raises questions as to the influence and power that a chair may exercise in leading reform efforts. By using the word power, we are considering the ability of an individual "to cause or prevent change" (Bybee, 1993, p. 157), through their access to the personal and institutional relationships that characterise departments, schools, districts, and wider reforms, not their possession of an officially sanctioned role. It is in this understanding that the impact of the apparent incongruency between the departmental logics of practice and the reform logics must be understood. Without a credible understanding of, and relationship to, the reform logics of practice, a chair is effectively powerless to develop a relationship between the reforms and the department, and hence the school and district. Relating the concept of power to the theoretical framework of the field, Bourdieu (2005), recognized that the field is a "field of struggles" in which individuals are positioned differently, and with different resources. These resources can be employed "in order … to preserve *or transform* the currently prevailing relation of forces" (p. 199; emphasis added). The capacity to affect change gives the chair influence and power – the question is "do the leadership positions they adopt generate possibilities for reform?"

The Narrative Positioning Analysis identified four leadership positions that chairs can adopt: Liaison, Informal shared, Formal shared, and Autonomous. Each of these positions, from a Bourdieuian perspective appears to offer different levels of power, that is access to the personal and institutional relationships necessary to effect change. The liaison position adopted by Brad

appears to be lack power, as Brad was reduced to "*pushing the administrators agenda".* In such a circumstance, the capacity of the department and chair to exercise the autonomy needed to begin the arduous task of engaging with the reforms is severely restricted. The chair as liaison may have some power to select the strategies for attempting to meet the administrators' agenda, but ultimately the leader is powerless to effect change. Faced with the power of administrators more concerned with test scores, the chair has insufficient power to argue that the time and effort needed to understand, and implement, the wider reforms: *initiatives from the grassroots aren't going anywhere; even when they would be good for students.*

Charles would appear to be even more powerless to lead any engagement with the reforms than Brad, who at least had the power to engage his teachers with the peripheries of the reforms. Charles' informal shared position is politically untenable: within the department he is caught between influencing and alienating his teachers, while also facing district mandates to concentrate on literacy strategies. The net result is a department that appears increasingly deprofessionalized and more concerned with meeting short-term administrative requirements: "*while they will try the strategy, and then forget about it".* Charles' conundrum is that a requirement of his position – the teacher evaluation process – also reduces his access to the personal and institutional relationships that characterise departments' capacity to shape teaching and learning. The election of the science chair may have been a well-intentioned policy, but it appears more as a poisoned chalice in which real power continues with the school, while the departmental capacity (and willingness) to engage with reforms is effectively neutered.

Representative of a formal shared leadership position, Kim has direct access to school-wide decision making processes. The school has established a STEM academy and the district science coordinator is active in supporting teachers. On the surface, Kim appears to be well positioned to lead the department towards enacting the vision of science education advocated in the reforms. However, the source of Kim's power, access to the institutional and personal relationships of the school administration, also heavily invests her in maintaining the balance of forces that operate within the school and department. Hence, the narrative indicates support for assessment and data-based instructional interventions, and the co-opting of the language of the reforms to suit the school's priorities. The co-opting of the language to support extant departmental logics of practice effectively stifles questioning of those logics, while simultaneously stripping the reforms of meaning, and hence of their capacity to challenge the power of the contemporary discourse of science education.

Melanie is representative of chairs that have a level of autonomy from school-level management. A level of autonomy, and a supportive school administration, would appear to be conducive to allowing a department to engage with the reforms; but that pre-supposes a leadership disposition towards the reforms. Such a disposition is only marginally evident in this department. While Melanie supported a number of instructional innovations, those efforts were diffuse and remained firmly on the periphery of the reforms. The reform logics of practice form a coherent vision of science education, but without leadership, teachers are free to pick and choose items that are of interest to them. This smorgasbord approach can be driven by the apparent availability of

resources: *"I went to one of the STEM programs that help with resources"* to the interest of the teacher: *"he wants to do more project-based teaching within biology".* Regardless of the individual's motivation, the lack of a clearly articulated approach to the reforms appears to render them incoherent and incapable of acting as the basis for challenging existing logics of practice. One result of this incoherence is that even peripheral reforms are vulnerable to more administratively powerful forces: "*It is supposed to be a capstone project at the end, but we haven't been allowed the time for them to work on this".*

Implications and Concluding Comments

Clearly, none of the leadership positions represented here empowered the chair to engage with the reforms in a way that departmental logics were critiqued, challenged and reformed. The hegemony of the contemporary discourse of science education was evident in each case, as was the subordinate position of the power of the chair to the power wielded by school and district administrations. There are two major implications here for chairs, one personal and the other institutional.

The position of the chair is an important one, being simultaneously subject expert, administrator, and curriculum leader. The leadership position they occupy is not static – there will be times when the chair will need to act as a liaison, times to enact administrative decisions, and times to allow teachers in the department to innovate. Chairs need to have the capacity to move between these leadership positions, but underlying everything should be inquisitiveness around teaching and learning. Such a stance requires that they work to shape the departmental environment so that learning is at the heart of the department's work. A critical part of that is that the chair needs to take personal responsibility for either challenging their own practice, or delegating authority to reform-minded teachers within their departments to work with the reform logics of practice (Judson & Lawson, 2007), and being prepared for the modeling of both successes and failures. This requires a change in disposition, and must start with dissatisfaction with extant departmental logics. According to Posner, Strike, Hewson and Gertzog (1982), the reform logics must begin to be seen to be intelligible, a process in which experience is applied to the change and possibilities are explored. Reform must also come to be seen as plausible and offer solutions to questions of practice. Finally, teachers within the department must begin to perceive the reforms as opening up new avenues for inquiry in practice. This is an incremental process, meaning it will take time and be messy. Unfortunately, this also brings it into conflict with the institutional implications of our analysis.

Our analysis highlights the disproportionate power of administrators and the contemporary discourse in science education in relation to the power of the chair and reform documents such as the *NGSS*. The reform documents appear to have a limited power to influence teacher practice, despite the constant exhortations to increase enrolments in science and technology programs across western countries. It would appear, from the chairs in this article, that issues of teacher accountability and bureaucratic fiats have greater power to influence educational decision-making at the departmental level. For a chair to engage with the reforms may simply be seen as too

difficult, especially given the immediacy of these other demands. Politically, it may be easier for a chair to argue for issues (and by extension, resources) that can be reduced to a simple slogan: it is then easier to say that "something" is being done. For example, two of the schools discussed here had established STEM academies. With investments such as these, the department can appear to be engaged with reforms, when in reality they are operating on the peripheries of the reforms.

It may be that the contemporary discourse in science education, with its heavy emphasis on content knowledge, has been so successful in accreting power to itself that it has turned into a caricature of science as a form of inquiry. Science, as a school subject, may have come to provide answers, rather than being a way of understanding through questioning. How to effectively support and em*power* chairs who are dissatisfied with this situation, and their own departments' logics of practice, will be a valuable research contribution. It may also be a call to action for science teacher educators, and district (or state) science curriculum specialists, to provide both pre- and in-service science teachers with the leadership tools and knowledge needed to make a difference.

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