NAVIGATING THE TENSION BETWEEN THE MASTER

NARRATIVE OF THE ACADEMY AND THE COUNTER-

NARRATIVE OF REFORM: PERSONAL CASE STUDIES FROM

WITHIN AN ENGINEERING EDUCATION COALITION

A Dissertation

by

PRUDENCE MERTON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2006

Major Subject: Educational Human Resource Development

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Chair of Committee,	M. Carolyn Clark
Committee Members	Christine Stanley
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ABSTRACT

Navigating the Tension between the Master Narrative of the Academy and the Counter-Narrative of Reform: Personal Case Studies from within an Engineering Education Coalition. (May 2006)

Prudence Merton, B.A., Chatham College;

M.S., Texas A&M University

Chair of Advisory Committee: Dr. M. Carolyn Clark

This qualitative study inquired into the personal experience of three engineering professors and one associate dean who participated in an engineering education coalition—the Foundation Coalition—a National Science Foundation-funded project which attempted to reform undergraduate engineering curricula at six U.S. institutions of higher education. Through analysis of occupational life histories, and data from a larger study of curricular change processes, two dominant social narratives emerged. Cultural attributes of academia were conceptualized as a master narrative. The reform effort emerged as a counter-narrative by calling for a "culture change" in engineering education. I describe five areas where the counter-narrative challenged the master narrative: the rationale and need for educational change, the nature of faculty work, disciplinary relationships, relationships among faculty, and the incentive and reward system.

The counter-narrative of reform promoted curricular and pedagogical change, more interdisciplinary and integrated foundations for engineering education, and encouraged partnerships and community over faculty isolation and autonomy. The counter-narrative challenged faculty complicity with the master narrative and offered alternative ways of viewing their role as faculty in higher education. The master and counter-narratives clashed over the nature of faculty work in research universities,

fueling the ongoing debate about the relative value of research and teaching and the associated reward system.

This study found that the four participants used different strategies to navigate the conflict between the two social narratives. One participant was informed by an ideal vision of engineering education, and never relinquished the quest for an opportunity to realize that vision. Another professor, energized by the collaborative environment created by the Coalition, continued to find creative avenues to partner with others to improve engineering education. A third participant worked, through compromise and accommodation, to craft an improved curriculum that worked within the local institutional culture. And finally, an associate dean, who rejected the duality of the master/counter-narrative worldview, reframed the reform effort by encouraging faculty working in educational change to view their work as scholarship. The findings from this study support faculty engagement in the scholarship of teaching and learning and encourage faculty developers to find ways of supporting faculty in that effort.

DEDICATION

To my partner Jo,

for being "someone in a tree" throughout my life.

And there's someone in a tree

Or the day is incomplete

Without someone in a tree

Nothing happened here.

"I am hiding in a tree

I'm a fragment of the day

If I weren't who's to say

Things would happen here the way

That they happened here?"

from "Someone in a Tree"
Pacific Overtures
By Stephen Sondheim

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

In the last 30 years there have been pressures for educational reform placed on our institutions of higher education that have given rise to curricular change, technological innovation, and new techniques for teaching (DeZure, 2000). Colleges and universities are being asked to place greater emphasis on undergraduate teaching and learning, while at the same time state appropriations are declining, and faculty are under more pressure to bring in research dollars. The previous academic generation's idealism that forced universities and colleges to deal with the "problems stemming from the Vietnam War, racial inequality, poverty, and the environment" has withdrawn (Geiger, 1999, p. 65). The demand for social relevance—the product of the 60's and 70's—has turned into a demand for economic relevance. Instead of stressing a liberal education that prepares students for their civic role in society, parents, industry representatives and government officials are demanding that colleges and universities do better to prepare their graduates to tackle the needs of the workforce in the 21st century (Altbach, Berdahl, & Gumport, 1999).

In spite of many change efforts, there is a common belief among those both inside and outside the academy that change in higher education is difficult if not sometimes impossible. This resistance to change is attributed to different aspects of the academy as a social institution, most frequently classified under the umbrella of the academic culture. Some critics assert that the conservative nature of academe is related to it's function as an agent of social reproduction (Green, 1997). As a primary system of supporting social norms and values, educational systems actively work to maintain the status quo. Others blame the faculty reward structure as the mechanism that maintains values, the discipline-orientation, and the essential isolation and autonomy that characterizes academic life(Lazerson,

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This dissertation follows the style of the *American Educational Research Journal.*

Wagener,& Shumanis, 2000; Schneider & Shoenberg, 1999). Still others tend to blame the academic culture for creating forces that inhibit change (Sunal, Wright, Hodges, & Sunal, 2000). Some advocates for change in the academy argue that the faculty should be the focus of any change effort, for it is in the faculty behavior where institutional missions and values appear. If individual faculty members do not change, nothing changes.

Sweeping generalizations about the academy's resistance to change, however, are not helpful in understanding how to effect change. Since the Carnegie Foundation for the Advancement of Teaching stimulated dialogue about the status of teaching in 1987 and again in 1990 (Boyer, 1987; Boyer, 1990), there have been many attempts at universities and colleges to improve teaching and learning. Some have been successful. My review of the literature on change in higher education revealed several recent studies, most notable a series of papers reporting on the results of the American Council on Education Project on Leadership and Institutional Transformation (Eckel, Hill, & Green, 1998; Kezar & Eckel, 2002; Kezar, 2001) which identified successful change strategies. But for a research-oriented culture, it is surprising that academicians have not produced more empirical studies documenting the processes of organizational and personal change that are used to effect change. This dissertation contributes to understanding the problem of how to effect change in higher education.

My purpose in this study was to examine how faculty, while working to effect educational reform, negotiated the conflict between the values, norms and beliefs of the academic culture within which they worked and those presented by the reform effort. In this dissertation, I see these counter forces as competing discourses that I call the master narrative of the academy and the counter-narrative of reform. Because these aspects of the academic culture often drive and direct what a typical academic career looks like, I chose to gather and analyze occupational life histories of four professors who worked to effect curricular change within their institutions. Participants' storylines were embedded in two dominant narratives that reflected the values, norms and beliefs of the academic culture and reform effort.

The participants in this study worked in a curricular reform project in undergraduate engineering education. The institutions in which they worked were members of a coalition of six engineering colleges in partnership to effect curricular change in their undergraduate programs. I learned about the project when I joined a research team to study the organizational processes by which change occurred on these campuses. In this introductory chapter, I provide the kinds of information that I needed before I could start work on this project. I start with a brief overview of the work of prominent theorists and researchers in educational change. I then follow with a description of the profession of engineering education and its history in the United States; a history of how the National Science Foundation became an agency of change in engineering education; and finally a description of the research project in which my dissertation study was nested.

Academic Change

There are various ways to classify the scholarship on educational change. Kezar and Eckel (2002a) suggest that most of the literature on academic change offers generalized change strategies that can be used regardless of the type of change or institution. These studies, though providing insights about various models of change, are not helpful when targeting a specific change within differing institutional contexts. The second category focuses on the change process from a context-based level, taking into consideration environmental, institutional and cultural characteristics. This last area of research most informed my study.

The organizational structure of colleges and universities can affect the outcome of change initiatives. Characterized as "loosely-coupled" systems (Birnbaum, 1988; Weick, 1976), the connections between organizational in higher education institutions entities are weak, making communication infrequent and difficult, and slowing down or even stopping response rates. A university's structure also makes collaborative teaching and interdisciplinary integration difficult (Frost & Teodorescu, 2001).

Because of the pluralistic nature of curricular decision-making in higher education, there are academic subgroups that need to be considered when initiating curricular change.

Scott (1992) in Mallon (2001, p 40) called this characteristic "multicephalous," multi-headed, for the many "heads" usually involved in decision-making. The fact that subgroups, like curricular committees and disciplinary advisory councils, are often dependent on other subgroups for power and influence intensifies the political nature of academe (Kezar, 2001). Lindquist (1974) writes that besides students, faculty and administrators, there are external groups like funding agencies that influence curricular change. Most of all, because faculty have primary responsibility for curricula, gaining and maintaining their involvement and input is essential (Boyatzis, Cowen, & Kolb, 1991; Frost & Teodorescu, 2001).

The aforementioned ACE project on Leadership and Institutional Transformation was a five and a half-year effort to assist twenty-six institutions in their attempts at transformational change. Transformation implied changing institutional cultures, which they defined as "dominant patterns of shared assumptions, values, beliefs, ideologies and meanings that people have about their organization that shape what individuals do and how they think (Peterson & Spencer, 1991, quoted in Eckel & Kezar, 2003, p. 27). They found Bergquist's (1992) model of four archetypes of academic culture (the collegial, managerial, developmental and the negotiating cultures), as well as Tierney's (1991) institutional culture framework helpful in understanding how culture affected change processes. Building on the notion of the "reflective practitioner," (Schon, 1983) Eckel & Kezar (2003) suggest that before attempting any change, institutions should conduct a cultural audit using Tierney's taxonomy of cultural elements of higher education institutions.

Engineers and Engineering Educators

As a profession, engineering has always been seen as a noble calling. Hardy Cross (1952) underscored the importance of engineering to society when he referred to it as "the glory of the adaptation of science to human needs" (p. 8). In 1828, Tredgold provided the earliest definition of the profession as "the art of directing the great sources of power in nature for the use and convenience of man" (Florman, 1987, p. 66) and subsequent definitions always include the purpose "to serve" humankind. In the simplest terms, engineers solve problems, and in doing so they serve society. In response to an articulated

need or problem, "engineers design, invent, modify, change, adjust, trim, manipulate, construct, assemble, disassemble, and just in general move things around" (Feisel, 1985, p. 5) until the problem is solved. While the first engineers were craftsman who learned their skills through apprenticeship training, today's engineers become engineering professionals through formal training and certification (Grayson, 1993). An engineering educator teaches the aspiring engineer how to use basic principles of science to design artifacts that serve a purpose.

Engineering Education

American engineering education, like higher education in general, has grown and changed in response to our country's territorial, industrial and technological development. Its history can also be characterized by recurring debates about the undergraduate curriculum. Should a bachelor's degree provide a broad general grounding in all the engineering disciplines or should it stress specialization in one? How should practical hands-on design experience be balanced with design theory? Should courses in the humanities and social science be required? And if so, how many and when in a student's program? How long should the degree program be?

Engineering education has also reflected the practicing engineer's quest for self-definition and social recognition as a professional. There has been a continuing rift between science and technology as engineers struggled in this regard. The word "engineer" derives from the French *ingenieur* and had a connotation as a lowly craftsman-builder. Is engineering just "applied science" as exemplified in the slogan for the 1933 Chicago World's Fair, "Science Finds, Industry Applies, Man Conforms?" (Kline, 1995, p. 195) Are engineers primarily technologists or scientists? In a study of the science and engineering rhetoric from 1880 to the end of WWII, Kline (1995) found that

> …scientists tended to emphasize the epistemological dependency of applied science on pure science to argue for financial support for their research [while] engineers called themselves 'applied scientists' and their field an 'applied science' to raise their occupational status above that of artisans to the level of a learned profession. (p. 198)

Along with the development of credentials and professional societies, formalized higher education in a discipline characterizes an occupation as a profession (Freidson, 1994). Unlike law and medicine, engineering has a relatively short history as a profession. The first professional engineering school, *Ecole Polytechnique*, was created in France in 1794 (Grayson, 1993).

These issues and debates, as well as external institutional forces, have been causing the engineering curricula to change, sometimes radically, over the past 150 years. The condition and direction of engineering education relative to society's needs has been frequently studied and reported to the engineering community. The habit of self-investigation, reflection and recommended curricular revision has led one British observer to proclaim American engineering education as "the most visible undergraduate curriculum in the United States…and the subject of persistent experiment" (Silver & Brennan, 1988). In general, the direction of engineering education has been to shift from "experience to science" and to replace valuing experience with valuing attainment of scientific knowledge as a basis for engineering education (Seamans & Hansen, 1981).

Other changes in engineering education were a result of American involvement in major wars, both on our own soil and abroad. It was during the American Revolutionary War when General George Washington notified the Revolutionary Congress that there was a need for homegrown engineers, rather than the few European engineers the country was depending upon. Eventually formal education in engineering was created when the United States Military Academy at West Point was established in 1802 (Grayson, 1993). The War of 1812 boosted the reputation of the Corps of Engineers and the military academy, whose graduates planned and built many of the land and sea fortifications for the war (Office of the Chief of Military History). The first incarnation of something like the engineering education that we see today came in 1817 when Sylvanius Thayer took command of West Point. He redesigned the school and established a four-year, college-level curriculum that provided military as well as civil engineering training. Thayer was one of the first to stress that engineering skills could be transferred easily from military purposes to meet civilian needs.

The military academy became the model for engineering education in the United States (Grayson, 1993).

Early incarnations of engineering education were far from standardized. Each school had its own interpretation of what kind of training an engineer needed. But the biggest boost to the development of engineering education in the U.S. came with the passage of the Morrill Act in 1862. This piece of legislature created land grant colleges (Florman, 1987; Troxler, 1995), most of which had engineering departments.

By the 1890's engineering education had changed from a craft-oriented trade to an applied science. A landmark in the history of engineering education occurred at the first International Congress of Engineering at the Columbian Exhibition in Chicago in 1893. Of the eight divisions in the Congress, Division E was devoted to engineering education while the other seven focused on specific engineering disciplines. At the end of the weeklong meeting, Division E created a permanent society for the promotion of engineering education (SPEE), which later became the American Society for Engineering Education (ASEE), an association that continues today, and one of the oldest associations dedicated to supporting education in the professions.

When the United States joined the war against Germany in April 1917, there was an urgent need for more engineers. Not only did the country's fighting apparatus require more engineers, but the separation from Germany's industrial products caused the U.S. to step up its own industrial research capabilities (Kline, 1995). This caused a response on two fronts that eventually affected engineering education: in university research support and in undergraduate education. The transformation of engineering education did not become fully realized until after World War II.

Since World War II, engineering education in the U.S. has undergone one major paradigm shift. It moved away from an emphasis on engineering practice and technical hands-on knowledge to a focus on the development of mathematical competence and a thorough understanding of natural science principles. Ferguson (1992) partly attributes this shift to the bad press engineers had received during the Depression (as they were blamed for industrial mechanization that displaced so many workers), and the prestige and attention

scientists received during and after World War II. But the major contributor to the elevation of science and research over practical and experiential knowledge was the need, on the part of the United States government, to maintain technological and military readiness, if not superiority during the Cold War. For the engineering community, aligning with the field of academic science would only lend more prestige and respectability to the discipline. Government support of basic research through grants and contracts in the nation's universities intensified during World War II, and it "accentuated the demand for engineering faculty with academic research credentials rather than experience as practitioners" (Prados, 1998, p.1).

In response to the prestige crisis in the profession, the American Society for Engineering Education (ASEE) established a committee to review undergraduate engineering curricula. The 1955 committee's report (called the Grintner Report after the chairperson of the committee) contained two recommendations. The first was the elimination of courses with "high vocational content" as well as those "primarily attempting to convey engineering art and practice." Secondly, the report stressed establishing in engineering curricula six core courses in the engineering sciences: "mechanics of solids, fluid mechanics, thermodynamics, transfer and rate mechanisms, electrical theory and nature and properties of materials" (Ferguson, 1992). Engineering schools responded by making the recommended curricular revisions. Some believe the effort to make engineering "more scientific" went too far and engineering education lost some crucial opportunities for experiential learning. Looking back, one advocate for the change said, "[a]t best, those of us who spearheaded the change to a more 'scientific' basis for engineering education can now claim only to have been the 'foundering' fathers of the current educational system" (Tribus, 1990, p. 524). This dissatisfaction with the state of engineering education has created a call for another paradigm shift, a major champion of which is the National Science Foundation.

Engineering Education and the National Science Foundation

In 1950 the National Science Foundation (NSF) was established to, among other things, "encourage and develop a national policy for the promotion of basic research and

education in the mathematical, physical, medical, biological, engineering, and other sciences, [and] to initiate and support basic scientific research in the sciences" (Mazuzan, 1994, p. 6). From its inception until 1968, the NSF stayed true to its mission of supporting basic research in the sciences and its impact on applied engineering research and the engineering higher education community was only peripheral. After the launch of *Sputnik* there was a flood of reform efforts primarily directed toward K-12. Finally, in 1968, the Daddario-Kennedy amendment changed the heavy focus on science by authorizing the NSF to support applied as well as basic research. Two programs were created as a result of the change to the Foundations' charter: Research Applied to National Needs (RANN) and Interdisciplinary Research Relevant to Problems of Our Society (IRPOS). A few short-term engineering activities were supported under these programs. The NSF was gradually beginning to recognize that "engineering was different from science in style, traditions, and university institutionalization" and "elevated" engineering to a separate directorate in 1979. In 1981, NSF expanded the science education arm of the agency to include engineering education, creating "the usual cries from segments of the research community that such emphasis would cause the engineering budget to grow at the expense of science" (Mazuzan, 1994, p. 19).

The engineering education reform movement started when NSF's governing board, the National Science Board, issued in 1986 their first comprehensive review of science and engineering education. Called the Neal Report after the chair of the committee, it called for making undergraduate education in the sciences, math and engineering a national priority, particularly for the National Science Foundation, as well as other private and public entities (Neal, 1986). NSF responded with the creation of a new unit, the Division of Undergraduate Education, which directed its program activities towards learning and teaching, and many projects were funded through the Division of Engineering Education.

One such project was the Engineering Education Coalitions, a program announced in 1989 to encourage "bold, innovative, and comprehensive models for systemic reform of undergraduate engineering education and to increase the retention of students, especially women and those minorities underrepresented in engineering" (National Science

Foundation, 1989, p.1). NSF funded six coalitions, each receiving $2 to $3 million per year. One of these was the Foundation Coalition (FC), which had as its goal the improvement of the fundamentals, or foundation, of engineering education. The FC consisted of six institutions, Arizona State University (ASU), Rose-Hulman Institute of Technology (RHIT), Texas A&M University (TAMU), University of Alabama (UA), University of Massachusetts-Dartmouth (UMD), and University of Wisconsin-Madison (UWM). Though faculty teams in these institutions worked independently within the particular context of their institutional culture, their intentions were to develop/pilot/implement curricular changes concurrently, and as a coalition, share their ideas and experience in order to support each other's work. Each partner institution worked within their particular and differing contexts to develop innovative curricula based on four thrusts: integration of conceptual concepts across disciplines; active and cooperative learning; the use of technology in the classroom; and on-going assessment and evaluation.

Overall, the FC's goals for curricular change were very ambitious.   Their initial action plan called for revamping the entire undergraduate curricula for all students at each FC institution within the first 5-year grant period. Many new curricula were implemented, but the effort did not achieve the level of participation they envisioned. Near the close of the first five-year grant period, FC leadership began to realize that they had not fully prepared themselves for implementing and managing a change of such magnitude, and began to turn to the extensive knowledge base in change management to better understand the process of change. About the same time, they decided to instigate a self-study, a research project in order to understand how the changes that did occur within the FC came about. From August 2000 to September 2004, I was a member of the four-person team on that research project. I will refer to that study as the "FC change study" or just "change study." It is within this large case study that my dissertation research is nested.

The Foundation Coalition Change Study and This Study

When the other three members of the FC change study team and I started working in August 2000, all six FC institutions had institutionalized at least one new undergraduate curriculum. Through interviews and document analysis, we constructed the story of the

change process as it occurred on each campus. Though the NSF support for the research has ended, we continue to present at conferences and publish papers from our research.

While our study focused on the organizational process of change, during our analysis we also developed categories from the data that dealt with issues related to people's behavior that either hindered or helped that process. These categories echoed the change theory literature; that is, we used categories like *resistance*, achieving *buy-in*, and *administrative support* (Boyatzis et al., 1991; Chaffee & Jacobson, 1997; Ekroth, 2000; Fullan, 1993). It soon became apparent from our data that some kind of personal change, usually involving the reform leaders, whether it was in attitude, value or behavior, accompanied the organizational changes. Personal change was not a research focus in the FC change study. We were looking at organizational processes within an organizational context. What was missing was an understanding of the personal experiences of change and their meaning within the individual life story context. I had believed the larger environmental context as well as the individual life history context had a bearing on whether change occurred. By choosing to focus my dissertation research on the personal experience of change in the FC, I had a unique opportunity to see how the FC storyline and the individual participant's storylines came together to create change, of any type. Figure 1 illustrates how these two studies intersect and inform each other.
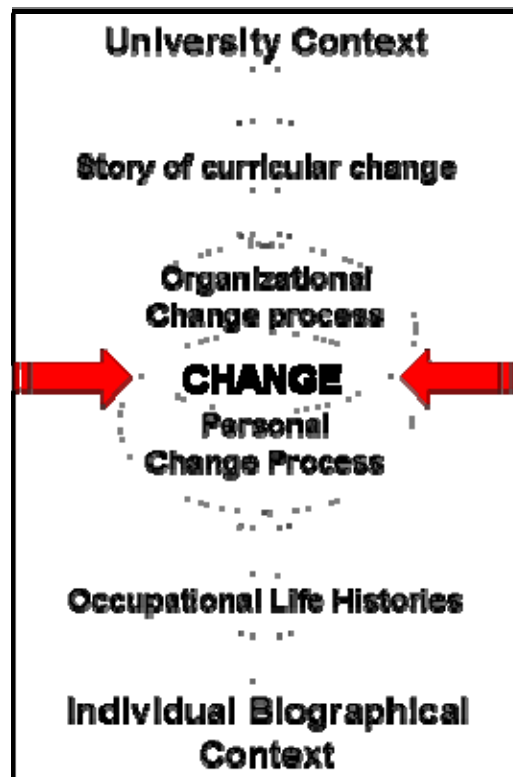
Figure 1. Intersection of the FC Change Study and This Study.

As I noted earlier, the purpose of this study was to understand how faculty, through their stories of working to effect organizational change, made meaning from the conflict they experienced between the values and norms within the academic culture and those advocated through the educational reform effort.   I also wanted to know how these stories of personal change contributed to what we knew about fostering change in institutions of higher education. By placing the institutional change story within the context of participants' occupational life histories, I was able to see the interplay between many kinds of change events. Though the institutional and individual stories were distinct, their boundaries were porous where they intersected, as indicated in Figure 1 by the arrows. It is surprising that much of the literature in organizational change, innovation diffusion, and change processes rarely speak directly to the personal experience of participating in the change process by individuals.

This study is significant for several reasons. It contributes to our knowledge of academic change by revealing the beliefs, values and experiences of faculty involved in the change process. This focus receives very little attention in the empirical literature on change in higher education. This study is an example of how context and its attendant social narratives both facilitate and hinder growth and change in individuals and organizations. While academic culture has also been a much researched and theorized topic, there is little in the literature that reports how faculty members negotiate the cultural barriers presented by the competing discourses of the academy and reform that inhibit efforts to improve curricula or teaching within the academy. Change models are too often prescriptive, rather than descriptive of actual practice. Again, there is a need for more empirical work. This study also contributes to our understanding of faculty lives and the professors' career development path, particularly in the discipline of engineering.

In NSF and FC documents, the terms *systemic reform*, *curricular change* and *educational innovation* are used to refer to actions that aim at improving undergraduate engineering education programs. All of these imply something that is *new* and *different*. In the coming chapters, I use some words and expressions in ways that may be idiosyncratic. I define what I mean at those junctures. I place the discussion of the various bodies of literature that inform my study in each chapter at relevant points in the narrative. This placement also reflects my frequent forays into the literature throughout each phase of my study.

In this first chapter, I have briefly introduced the concept of curricular change in higher education and provided a brief history of engineering education. I have described the world of engineering education within which this study is located. In the next chapter, I address methods of inquiry, issues related to researcher bias, how I went about collecting and managing the data and why I chose certain methods to analyze the data. Chapter III provides my central theoretical premise. Each of the next four chapters focuses on a particular participant and their story. In Chapter VIII, I conclude by summarizing my findings and bringing the narrative back to the present by highlighting the implications for effecting change and improving teaching and learning in higher education.

CHAPTER II

METHODOLOGY

Introduction

In the first chapter, I described how my study was "nested" within a much larger qualitative research project. The idea for this dissertation topic came together after I had been working about six months on the FC change study. It was a period where we as a team were struggling with the "messiness" of the study, working out procedures for collaborating, discovering issues related to insider and outsider status, and learning that we each held different research worldviews. That period of time was very frustrating for me. I was finding that the qualitative research procedures I had learned and studied – the ideal – did not always match how it was accomplished in the real world. We were constantly working around constraints created by faculty workloads (for both the faculty members of the research team and the faculty members we wanted to interview), and the fact that one member of our research team worked at the University of Alabama, making our development as a team more difficult. Dr. Carolyn Clark and I were the most aware of this "messiness" and we reflected on what that meant to us as qualitative researchers in a conference presentation in June of 2002 (Merton & Clark).

With the benefit of hindsight, we identified aspects of the research design that we would have done differently had we been brought in at the very beginning of the project. More time would have been devoted to planning upfront. We would have discussed and thought through the process of gaining entry to the research sites. We would have devoted more time to getting to know each other better and talked about how we might collaborate in the work ahead. But most importantly, we would have started the process of identifying our individual worldviews through which we saw the research. We would have made sure that we agreed on interview methods and protocol and provided some training for the two engineering professors on the team who had never done this kind of research before.

We directly confronted the effect of the prior knowledge and experience that the two engineering professors on our team had on our research. They had been active

participants in the FC reform effort, as curriculum developers, as teachers in new courses, and as campus leaders and members of the grant's management team. They had participated in discussions about each institution's progress, debated about issues related to budget allocations and priorities, and been party to the political maneuverings and negotiations related to keeping the NSF happy with the progress of the Coalition. The implications of all this "insider" knowledge was occasionally discussed, but only once, during a five-day retreat near the end of the study when we were focusing on the cross-case analysis, did we realize what these individuals had at stake. We were discussing how we wanted to write-up our findings and whether their status as "insiders" gave rise to a desire to minimize negative findings and issues and therefore write in order to "look good" in front of colleagues and the NSF. Would it be possible to tell the story as we saw it?

For me, one result of all this reflection was that I began to examine the lenses through which I was interpreting the FC data, and how that was affecting the way I approached my research process for the dissertation. I clearly had an opinion about the academic culture and how academics functioned within it. It seemed it was time for a "subjectivity audit" (Peshkin, 1988). I needed to be aware and reminded that there are parts of my life and experiences in higher education that color what I do and who I am as a qualitative researcher. During that five-day retreat I had a long discussion with Jim Richardson, the civil engineering professor on our team from the University of Alabama, who was also a participant in my dissertation research (see Chapter V). In that discussion we helped each other explore our ideas of academic culture and shared stories of our experience in higher education. It afforded us the opportunity to become aware of our "subjective positionings" (Goodall, 2000) about the academy and how they were affecting our thinking during the research process. For me, this awareness was present throughout the interpretation phase and writing of this dissertation. My subjectivity and how it is incorporated in my role as researcher is inseparable from my research worldview. In the next section, I retell some of my story in order to make explicit some of the inevitable subjective forces that influence my research.

Evolution of a Research Worldview

I came to Texas A&M as a graduate student twenty-one years after receiving my bachelors degree from Chatham College in Pittsburgh, a small, women's liberal arts college. At Chatham, most class sizes ranged from fifteen to twenty students. It was taken for granted that part of your course work meant meeting often with professors outside of class. During my four years there I became a member of a community that I knew cared about me and my emotional and intellectual growth. I loved my Chatham experience. The professors modeled a way of being with students that was respectful and non-condescending. It was as if we were on the same journey together. I received a broad liberal arts education against which I compared all of my later experiences in higher education.

After college I lived and worked in Washington D.C. I occasionally took courses at community colleges and completed a year-long para-professional program in landscape design at George Washington University, a large private institution. I enrolled to build my skills in horticulture and landscape design, planning to find work where my passion for gardening and landscaping skills could be used. In 1986, I moved to Houston. After four years working in the horticulture branch of Houston's Park and Recreation department, I decided to pursue a graduate degree in order to broaden my employment options to include horticulture management. I submitted an application to Texas A&M University.

The "ivory tower" started toppling in my first interview with the faculty member who was the graduate advisor for the horticulture department at Texas A&M. My memories of that meeting are not pleasant. I had submitted my application for admission into the Master of Science program. I was told that the first barrier to my admittance would be finding a faculty member "willing to take me on." With my background (minimal course work in horticulture, though lots of practical experience) that probably would be "very" difficult. I remember him strongly advising me not to pursue a master's degree. He said my records indicated that I certainly was not graduate student material, and anyway, I didn't need an advanced degree for what I wanted to pursue at the time, which was botanical garden management. I also remember him saying that graduate school would be very difficult if I did manage to get admitted. Because of my years

away from higher education (my age in other words) and being a woman (yes, he really said that), I would probably struggle with the more scientific and technical aspects of the program. Anger fueled my resolve, and when I was admitted to the program, that resolved only intensified. While my master's work was enjoyable and successful, it was capped, not by a triumphant walk across the stage (although that did occur) but by a departmental seminar required of all graduate students to report the results of their research. Looking back now, it is as if my story of getting the master's degree is contained between the bookends of two disturbing events, that first meeting with the graduate advisor, and the second, the departmental seminar, in which I presented the findings of my master's thesis research.

I had chosen a research topic and methodology foreign to the horticulture discipline. As a natural science, the research norm was the scientific method and the objects of study were plants and their environments, uses, improvement and so forth. Though I enjoyed the practice of horticulture, I also had a growing interest in people-plant interactions. I developed a research interest in aspects of people's relationship with plants, and how those relationships affected the health of people's lives. The kinds of questions related to this area of study could not be answered by the scientific method, and while a few of my peers attempted using survey techniques and statistical data to show benefits of working with plants and surrounding oneself with them, I wanted to know more. I wanted to know the story behind those relationships, and the nature of the relationships themselves. What difference did it make to people who worked with plants professionally? I had noticed that the horticulture faculty, with a few exceptions, lacked the enthusiasm, the enjoyment, the wonder and awe that the world of plants had given me. In classrooms, or laboratories, these "professional" horticulturists did not display the passion for their field I experienced from gardeners and designers, growers, retailers, and some students just entering the discipline. I did not frame it this way at the time, but it was my first exploration into the practitioner/academic dichotomy. Why were these academic horticulture professionals so different from "lay" horticulture practitioners? From the avid home gardeners? From the amateurs, the hobbyists? So I asked in my thesis research, what was the relationship horticulture educators had with plants? This research question called for the use of qualitative research methodology.

When my thesis research was complete, it was time to share it with the department. Graduate student research seminars in the horticulture department are well attended by faculty and students. I had a good showing. I was well prepared with the requisite PowerPoint slides, and I was appropriately nervous. My study was the first qualitative inquiry for that department; as my horticulture advisor recently reminded me, "We were breaking new ground." People were curious. I made my presentation and asked for questions. It became immediately clear that my audience didn't understand qualitative research very well, or at least they didn't respect it. At first I thought I had done a really lousy job of explaining my study. But I was assured later that many had entered the room with a negative opinion about the rigor and validity of this kind of study, and were not open to hearing about anything new. Some probably thought that I had a pretty easy go of it. Despite my advisor's attempts at defending the methodology and my work, the resistance to qualitative research emanating from that room felt like hostility directed personally at me. I struggled to maintain my composure when it was over as my friends and other supporters gathered around me to offer encouraging words. Finally, after what seemed like an agonizingly long time, I escaped to the ladies' room to get myself together.

I do not know if my findings from that study upset people as much as the idea that what I was doing passed as acceptable research towards a master's degree in horticulture. I'm not sure anyone really heard what I had to say about my findings. But since then, whenever I have had the occasion to tell people about my master's thesis, I only tell them about one part of my findings, and it has become more refined and focused each time I tell it. The major finding I discuss is that the professors I interviewed who worked in research universities were originally motivated to enter the study of horticulture because they had a love and passion for plants. They gardened at home, they had plants in their offices, and some kind of horticulture practice was a major part of their personal lives. Over the course of their academic career, however, that relationship changed. If they once gardened for pleasure, it was now associated with work. Any negative association with work was projected onto their gardening, so they no longer gardened. There were demands to do research and pull in grant dollars in areas that did not coincide with their personal interests. They compromised their personal values in the quest for the research

dollar, the addition to their vita, and a step closer to promotion/tenure. It was as if their academic life in horticulture had killed their personal passion for plants.

My point is that I bring to my research activities in higher education an opinion about research-driven academic institutions. As I listened to the stories contained in the research interviews, I noticed that I paid more attention to what a professor said was *not* working in his or her professional life so I could validate my opinions about the deleterious environment of the academy. While the concept of becoming aware of my own subjectivity was introduced to me in the very beginning of my apprenticeship as a qualitative researcher, I have never, until now, been as aware of how my personal experience as a researcher, a graduate student, and now as a faculty developer, influences how I approach the stages of the research process. I "stumbled upon my own subjectivity" (Peshkin, 1988) while reading the transcripts from my first interviews in this study. I noticed how my participants and I negotiated and constructed an academic world that was often congruent with my preconceptions. This view of the academy is described in more detail in Chapter III where I examine the academic culture metaphorically as a powerful master narrative challenged by a counter-narrative of curricular reform. The thorny issue of subjectivity, however, takes on a different hue when observed through the narrative framework I am using in this study.

As my research techniques changed along with how I thought about my research, ultimately my research worldview altered as well. I became more careful – that is, full of care – when analyzing the transcripts. I cared about the people that consented to be interviewed. I cared that their words, their stories, and their voices, be reflected and honored in my writing and I worried that I would not be able to do that. I did not want to be so arrogant as to think I could learn something about them that they themselves did not know already at some level.

In the ten years that I have been engaged in qualitative research, I have found that narrative as a form of inquiry makes the most sense to me. In designing this study, it was not a matter of finding the most "appropriate" research strategy or data-gathering tool to answer my research question. Nor was it about removing myself from the research and objectively viewing the transcripts, field-notes, web resources and other documents as containers of information, or resources to be mined, or pieces of a puzzle to be formed

into a whole. It was about creating a kind of "listening," a kind of interpersonal space that invited people to share their stories. It was about learning how to recall and re-hear those stories again and again while reading the transcripts. I found it difficult to hear the stories as if it were the first time. I wanted to recapture my feelings, my interpretations, and my evaluations that were occurring while the narrator spoke. I wanted to experience my own "subjective positionings" because they were informing my understanding of the narrator's story.

Narrative as a Theoretical Framework

The claims made about how people use narrative and what that use accomplishes are largely based on the acts of making explicit the tacit practical knowledge we use to interpret experiences from everyday life. As we communicate with others, talk-to ourselves or make sense of the narratives surrounding us in language texts or other modes of communication, we are constantly making meaning of what we experience. These meanings or interpretations are often communicated to others again through narrative, thus completing a cycle of narrative-making which we use to organize our experience. Narratives are representations of our experience, a product of attending to, and reflecting on particular experiences (Riessman, 1993). Most introductory paragraphs of publications in the ever-expanding canon of narrative research all point to this commonplace and ubiquitous nature of narrative. People engage in narrative research all the time, as children testing newly acquired communication skills, as adults learning how to "fit in" to diverse social situations, as speech writers drafting addresses for political candidates.

But the idea upon which my work rests is that there are ways of looking at narrative (and stories – in this section I use these terms interchangeably), that are not ordinary and everyday. And that these methods can help us understand certain phenomena better. These ideas are drawn from the literary and folklore traditions, the psychological, anthropological, educational and human development fields. The tools I will be describing were developed by linguists (e.g., James Paul Gee, 1999; Charlotte Linde, 1993), psychologists and/or therapists (e.g., Amia Lieblich, 1997, Jerome Bruner, 1991, Elliot Mishler, 1995), and sociology and social work (Catherine Riessman, 1993).

All of these tools are based on certain assumptions about narrative that can be applied to my research context, and that is what constitutes the theoretical framework.

In this section I describe the assumptions underlying my narrative research methods and simply explain why I chose these particular tools to arrive at my descriptions, analyses and interpretations of the interview texts; how I used these tools will be described in the data analysis section later in this chapter.

The first assumption is the following: *It is through narrative that people organize, make sense of, and construct their reality* (Bruner, 1987, 1991; Clandinin, 2000; Josselson, 1999; Mishler, 1995; Riessman, 1993; Somers, 1994).

> The most important vehicle of reality-maintenance is conversation. One may view the individual's everyday life in terms of the working away of a conversational apparatus that ongoingly maintains, modifies and reconstructs his subjective reality. .... the greatest part of reality-maintenance in conversation is implicit, not explicit. ...conversation takes place against the background of a world that is silently taken for granted. (Berger & Luckmann, 1966, p. 152)

This presupposes the possibility of multiple realities (both individual and social) and those realities are constructed. Narrative makes these realities and their construction apparent. Gee (1985) asserts that narrative is "probably *the* primary way" (p. 11, italics in original) people have of making sense of their experience. Jackson (2001) expands on this idea:

> Ordinary life is disorderly, cluttered, and full of things that don't seem to make a great deal of sense. It's in our stories that things make sense. Stories are how we know things and how we remember them. History is a story about the past that filters the endless details of reality through an idea. The idea lets us toss some things out and bring other things into sharp focus. What historians do for a living the rest of us do all the time. We organize the events of our lives in terms of these narratives. These stories are not just file cabinets or movies of ordinary life; they are also the devices with which we explain and justify ourselves to ourselves and to others. (p. 305)

Jackson draws attention to an important aspect of our lives that we tend to ignore. The chaos, meaninglessness, disorder, and incoherent aspects of living barely get noticed because we automatically construct some order, reason, and meaning to it through some

kind of story. The stories may find expression in the spoken or written word, in music, or in a painting; or they may be stories we silently tell ourselves as part of the running commentary that goes on inside our heads. Jackson's metaphor of tossing things out of the story, or bringing things in through focus describes how we construct narratives.

A second assumption is that our *stories are always contextual, situated not just in a time or place, but within an implicit or explicit relationship with the things with which we populate our stories, e.g., characters, objects, belief systems, myths, other people's stories, etc.*

There are different types of contexts that affect the creation of narrative. The context of the telling is influential: stories told about our work histories to a potential employer will be different than the work-history story we may share with a stranger we are sitting next to on an airplane. A narrator's intention and attempts at impression management also affect the narrative: the life history relayed to an educational researcher will no doubt be different than the life history told to a therapist. The stories we have about our lives are dynamic. They are colored and shaped by how we feel when we are telling them, who we are telling them to, and our listener's response (Linde, 1993; Mishler, 1979).

Related to the previous assumption, but deserving some more clarification, is the following assumption: *narratives reflect internalized prevailing norms of the culture or cultures/subcultures within which the narrator has lived or is currently living or working.*

Jerome Bruner, a cognitive psychologist (later labeling himself a cultural psychologist), came to an interest in narrative later in his career. His early work was devoted to understanding the cognitive aspects of learning, and he was one of the early proponents of constructivist theory that attempts to describe how learners construct new knowledge built on current or past knowledge (Bruner, 1966). In the late 1980s to early 1990s, Bruner began to publish texts devoted to his ideas about narrative and its role in cognition, at one point distinguishing two modes of cognition, paradigmatic and narrative cognition. Paradigmatic cognition is a way of knowing based on logical deductions, precise definitions and formal, rational argumentation. On the other hand, narrative cognition is a way of creating knowledge through narrating our experience, through attempting to make connections between events (Bruner, 1986). One of his main ideas

contributing to narrative theory is how our individual narratives, by their very nature as a product of a particular environment, must reflect the culture within which the narratives are expressed (Bruner, 1990).

Which takes us to the last assumption: *Narrative is always dialogical and interactive, whether explicitly between the narrator and the listener(s), or implicitly through the narrator ventriloquating multiple social positions, groups and/or ideologies.*

Bruner asserts our stories are always a means of negotiating our needs with the expectations, desires and wants of the culture or social milieu as a whole. This is where meaning-making occurs, in the embedded, and often implicit dialogue with the multifaceted context in which we are situated, the continuous storied interaction with our environment (Bruner, 1990).

In Bahktin's (1981) theory of heteroglossia, language and narration contain words and expressions that index various groupings of people based on certain characteristics or attributes. This can be distinguished in a text through the narrator giving voice to characters, groups, social structures and/or ideologies. The act of voicing another's idea or taking another's position as your own has been referred to as "ventriloquating" (Wortham, 2001). In an autobiographical narrative, the narrator positions him or herself in relation to these voices by entering into dialogue with them. It is through this dialogue the narrator defines himself or herself as well, through actual quotation of a conversation or verbal interchange, or more subtle methods like referencing, evaluations, or the use of meta-language. Wortham (2001) takes the concept of interactivity a step further by asserting that multiple selves can be constructed through interaction with the listener as well. A narrator accomplishes this through adopting or trying on different interactional positions in an autobiographical narrative.

In summary, the theoretical framework upon which my narrative methods are based consists of the following assumptions:

- It is through narrative that people organize, make sense of, and construct their reality
- Narratives are always contextual, situated not just in a time or place, but within an implicit or explicit relationship with the things with which we populate our stories, e.g., character, objects, belief-systems, myths, other people's stories, etc.

- Narratives reflect internalized prevailing norms of the culture or cultures/subcultures within which the narrator has lived or is currently living or working.
- Narrative is always dialogical and interactive, whether explicit between the narrator and the listener(s), or implicit through the narrator ventriloquating multiple social positions, groups and/or ideologies.

For this study, one way to understand how faculty experienced change from their work in the Coalition was to obtain their stories. I assumed that their experience in the FC was a significant period in their academic career, and that any impact it had on their lives would make itself evident through their telling of what I called their occupational life history. I also reasoned based on the theory of narrative described above, that their academic life history would reflect the social and professional environment of academia. Analysis of their stories could provide windows into the academic culture by focusing the analysis on how it is embodied in the narrative (Chase, 1995). Stories of people's lived experience can show us how we "come to *be* who we *are* (however ephemeral, multiple, and changing) by being located or locating ourselves (usually unconsciously) in social narratives *rarely of our own making*" (Somers, 1994, p. 606, emphasis in the original text).

Data Collection

In this section I will discuss how I chose my sample, then how I collected and managed the data.

Sample

We learned from the interviews in the case studies that actively participating in the FC program was a risky venture that provided opportunities for new experiences. In one participant's words, participating in the FC "changed my life." Other faculty advocating and working for change told us the experience had a profound effect on how they viewed themselves as educators. I assumed that anyone who took on the challenge

of either developing and/or teaching in these new curricula experienced personal change, in their values, worldview, or attitudes about teaching and engineering education.

I first chose as a pool of possible participants FC faculty who indicated in their change study interview or informal conversations that they changed in some way as a result of their participation in the Coalition. This initial list included people my colleagues in the change study recommended as well as individuals I had interviewed personally for that study. Based on the nature of their role in the FC, the personal stories they shared in their interview for that study, and my intuition about their ability to inform my research, I asked eight of these individuals to participate in my study and consent to two, possibly three, interviews. It was a diverse group of people. It included two women, people who played administrative and leadership roles, and people who were curricular developers and/or teachers in the new curricula. Most had extensive histories with the FC and had participated in the project from the very beginning. A few respondents also worked in earlier reform efforts that led to the FC. Since their interviews, three have been promoted to associate and assistant dean positions; two shared that these promotions were a direct result of their work in the FC. I chose four participants from this group to profile in this dissertation. I chose these respondents because they provided clear examples of the tension between the master and reform narratives and described different strategies to deal with that tension.

Though it is the norm in qualitative research to assign pseudonyms to keep their identity confidential, I asked for and was granted permission from these individuals to use their real names in this paper. Because the Foundation Coalition has been written about extensively, it is impossible to completely disguise the identities of those who played significant roles within it. What follows is a brief introduction to these participants in the order their chapters appear in this dissertation.

Chapter IV is devoted to Dr. Louis Everett, whom I interviewed after we had already written the case study for Texas A&M. Louis was influential in the development of the sophomore program that was used as the model for the FC sophomore core courses, and the leader of the FC freshman team for TAMU. Louis' story reflects his struggle to find a balance between the pressures of the research culture of the academy and his desire to realize an ideal teaching environment. His story about going up for

promotion to full professor is especially poignant and indicative of the difficulties professors face when choosing to work for curricular reform.

I chose Dr. Jim Richardson, a civil engineering professor at the University of Alabama (UA), because of his intense desire to understand the culture in which he was working and the resistance he felt from his colleagues to improving their teaching. Jim taught in and later coordinated UA's integrated freshman program called TIDE. Jim told me that because of his experience in the FC he was "coming out of the closet," by declaring his interest in improving engineering education and his desire to make it a prominent aspect of his research agenda. Jim was also a member of the research team for the larger FC change study, so we had many opportunities to talk about his experience in reform efforts. Jim's story reflects his struggle with what he sees as the main barrier to reform, namely the embedded devaluation of teaching within the academic culture.

Dr. Don Richards was a key figure in the FC sophomore program development and consequent adoption at Rose-Hulman Institute of Technology. His story of shepherding that program through the school to adoption is a good example of how understanding and accommodating to one's institutional culture can help in attempting to effect significant change. Don still plays a significant role, though unofficially, in keeping that program at Rose-Hulman running.

Dr. Karan Watson was my second interviewee at Texas A&M. A respected administrator before the advent of the FC, she assumed a leadership role that spanned all the FC institutions as the chief financial officer of the grant. Her story is one of an outsider rising rapidly through the hierarchy of higher education while understanding the particular constraints the master narrative of the academy has for women, especially in engineering. Karan's administrator position and the viewpoint it afforded permitted her to assist FC faculty in research institutions as they struggled with teaching-research conflict.

Data Collection and Management

Being a member of the research team for the FC change study was a huge asset to me as I began to do my research for my dissertation. Gaining entry, being knowledgeable about the pool of potential participants, and learning the basic story of the

Foundation Coalition were *faits accomplis* when I began my research. I had access to all the data from the change study and it was already coded and partially analyzed. The beauty of having my study nested within the larger study became apparent as I began writing. Each study informed the other and helped illuminate different viewpoints as I worked on writing up the findings of the larger study for conference papers and proposals while simultaneously analyzing my data for this dissertation. While the change study used a structured interview format so the four interviewers would ask the same questions, my study was much more informal. I employed what I refer to as the occupational life history interview, a type of open-ended, unstructured data collection process that resembled more a conversation between two colleagues than a formal interview. Because there has been relatively little use of this method for studying faculty lives in higher education, the following section provides a brief summary of the literature and conceptual framework.

I am defining the occupational life history as an oral unit with distinct beginning and ending points, that shares those events pertinent in the view of the speaker that have contributed to their present occupation. Charlotte Linde (1993) defines life story as an *oral* linguistic unit that is exchanged between people, the telling of which changes as different pieces of a life are experienced and as the circumstances of the telling changes. "Life history is the life story located within its historical context" (Goodson, 1992, p. 6). I include Linde's and Goodson's definitions to draw a distinction between life *history* and life *story* for this study. While I collected life histories centered upon each individual's career as a professor (what I am calling the occupational life history), the telling of these histories became another narrative act, another opportunity for the individual to re-construct or re-create their individual life story.

Life history methods have been used to study such experiences as identity formation (Bloom, 1996; Bloom & Munro, 1995; Linde, 1993; Mishler, 1999; Morgan-Fleming, 1999; Rosenwald & Richard L. Ochberg, 1992; Somers, 1994), coherence and life-course trajectories (Linde, 1993; Mishler, 1999), and sense-making in the wake of personal or large scale tragedy or trauma (Harding, 1992; Rogers, 1994). Educators' lives have been the focus as well in understanding perceptions of change (Polettini, 2000) and meaning given to teaching (Goodson, 1992; Goodson & Walker, 1991; Syrjala &

Estola, 1999), and to representing academia as the "plain tales of average academics" (Weiland, 1995).

> The good teacher's life is not an orderly professional pathway; rather, it is a personal journey shaped by context and choice, perspective and values. Narrative is uniquely well suited to that personal/professional odyssey. It is primarily through story….that teachers organize their thinking and tap into the collective, accumulated wisdom of their profession. (Jalongo & Isenberg, 1995, p. xvii)

I assumed that my participants' experience of change in the FC was not just a product of that particular experience but also a result of life-long experiences. including socialization in graduate school and faculty development experiences as a new professor. In my use of the biographical perspective I sought not to just collect an individual's career facts but to ask what meaning these experiences had for the individual.

I intentionally gave the men and women I interviewed very few parameters for their occupational life history. Chronologically, they could start the story whenever they wished and tell it however they wanted. For the most part I kept silent while they talked keeping notes of questions I wanted to ask after they had completed their story.

During the course of interviewing the participants, I noticed what kinds of information they chose to include and exclude. Some participants included stories of when and how they met their spouse, and other major personal transitions, some used them as major turning points or cornerstones of their work history. The interview with Karan Watson was somewhat different from the rest because of the ease with which she told her story. As a member of a minority in engineering, she told me that she'd been asked often to tell her professional story, so it had already been somewhat composed and recited. It was obvious she had reflected on certain episodes, made causal connections, and created the story to help other women in male-dominated professions understand their experience.

In addition to using the life history interview, I also took note of the context within which each interview took place. Narrative auspices are all the circumstances of a particular context of a speech event, like a research interview, that "mediate and condition" storytelling (Gubrium and Holstein, 1998). These include institutional and cultural norms, the physical site, the impact and quality of the relationship established

between the storyteller and the listener(s), and those actions or circumstances that mandate and motivate the storytelling.

A major part of the contexts within which the interviews took place were the respective institutions where participants were employed. All interviews took place in the participants' offices at work, a circumstance that in all likelihood affected the form and content of their stories. We all speak differently at work than we do at home. Participants also knew that I came informed about the work of the Foundation Coalition, which sometimes did not work to my advantage in that occasionally participants assumed I already knew about certain events and omitted sharing about their perspective. In addition, knowing that "personal change" was the focus of my research informed the choices participants made of what events to include or exclude in their stories. The interview that was about to take place was within the context of a research study about a specific topic. Like Gubrium and Holstein (1998), Mishler (1986) sees the awareness of context as being crucial in research interviewing: "Empirical research, then, might center on how participants articulate the stories they tell about themselves so as to construct biographies pertinent to matters under consideration" (p. 245).

All interviews were audio taped and transcribed. I used the qualitative data analysis software *NVivo* for manipulating and coding the texts. *NVivo* was also a extremely helpful tool in organizing my literature review (Gregorio, 2000). By creating documents of my notes from literature resources, I was able to code them as I would an interview transcript. I also did this with my field notes, research journal and a document I called "scaffold." The scaffold became an annotated outline for the dissertation, malleable and changing during my analysis of the data. This document was also coded, so when I was ready to write about certain topics, e.g., metaphors for change, my search for "metaphor" would give me examples from the interviews, ideas from the literature about how metaphors are used in written and oral narrative, and my reflections about metaphor use during the entire research process. In addition to these interviews, I also used some documents that resulted from the coding of interviews in the larger change study. For that study I used different qualitative data analysis software: *Ethnograph*. Using two different qualitative data management software (which were not compatible, i.e., I could not merge the data in either package) helped in keeping the studies separate

in my mind, and also allowed me to evaluate the package's usefulness for different kinds of data analysis.

Something needs to be said about how I used the transcripts and tapes to arrive at the notation you will see in this paper. I was fortunate to have the transcriber who transcribed most of the FC change interviews to also transcribe the occupational life histories. All of the interviews were transcribed for the purpose of capturing exactly *what* people said, not *how* they said it. Speech characteristics like intonation and rise and fall of pitch were not captured in the transcripts. I requested that pauses and repetitions be notated for the life history interviews but not the speaker's placement of emphasis or stress on particular words or phrases. Either during my first or second reading of the life history transcripts, I read the transcript and listened to the tape of the interview at the same time. I made corrections and only made note of those speech characteristics that I felt were important to understanding the speaker's meaning, or how they felt about what they were saying.

Narrative Analysis Methods

A major task for this study was choosing the best way to represent the narratives. By representation I mean the form by which I rendered the stories and segments of transcripts in this report of the research as well as how I manipulated the interview texts during the analysis to assist in interpretation. These different forms facilitate analysis, in that they can help make apparent ideas, themes or patterns that otherwise would remain buried in the text. These tools also provided a way of "reducing" or delimiting complex interviews to forms that helped me choose which episodes or stories to use as evidence for my argument. I used four types of narrative analysis methods, two that addressed the structure of the narrative and two that analyzed the linguistic aspects of the narratives. These methods are described in the following sections.

Structural Analysis

Before I began to attempt interpretation, I worked with each interview as a unit to analyze its structure. The *NVivo* software program allows a researcher to edit and manipulate texts after they have been entered as distinct data files. It is possible to label

different parts of an interview by topic, theme or my questions, by adding headings and subheadings. This hierarchal structure can then be viewed alone without the accompanying text in a particular screen view of the program. I used this structure when coding to return to a certain place in the interview, but most importantly the structure became part of the analysis. It was helpful to identify where themes appeared and reappeared in the interview and to make note of when (in the interview) and where (in the story) anecdotes, stories, explanations and other forms of discourse were used by the speaker to illustrate a point.

The other form of structural analysis I found helpful was isolating the "core" narrative according to Labov's and Walesky's (1967) theory of story structure. They defined a narrative as a retelling of a personal experience in the temporal order in which it occurred. Delineating the core narrative of an occupational life history may eliminate much of what made these stories interesting, but it assisted me in identifying patterns and themes. In addition, shorter, simpler stories were embedded in the interviews. These stories usually served to emphasize or illustrate a point participants were trying to make. Labov and Waletsky (1967) identified several parts of a narrative without which the narrative would not be viewed as complete or fully-developed. The story usually starts with an *abstract* which provides the listener with a summary, or overview of what they are about to hear, often presaging the point of the coming narrative. The *orientation* tells the listener where they are entering the story, often a time and place orientation, sometimes it can be more personal, locating the story within an attitude or frame of mind of the protagonist. The story is made up of *complicating actions,* events usually told in temporal order that illustrate the protagonist's actions. The *resolution* tells us how the story ends, and the *coda* brings us back into the present. Together these parts represent the core of the narrative.

Scattered throughout the narrative are clauses which Labov calls *evaluations.* These convey the narrator's personal opinions or feelings about the events in the story and their significance. The evaluation is the tool the narrator uses to place themselves in the most positive view possible, a mode of self-aggrandizement, and an act of self-presentation (Langellier, 1989). Evaluative clauses also contain much of the moral language people use when apprehending their past self's actions and evaluating those

actions against the present and local moral order (Linde, 1993; Walton & Brewer, 2001). These portions of the narrative are products of the narrators reflexivity, and are how the narrator shares their self-evaluation and any dissonance between their personal values and the shared values of the particular discourse communities they inhabit. Evaluative comments were critical to my analysis, often becoming the basis of my interpretations.

I applied the Labovian story structure analysis to discern the core narrative of each participant's occupational life history. I occasionally refer to them in the case study chapters of this document. I also used the Labovian structure analysis method for several stories embedded in the life history, coupled with re-presenting the narrative in stanzas, and subtitling various sections of the story for the final rendering.

Linguistic Analysis

There were two methods used in my linguistic analysis. A poetic analysis method informed by Gee (1996), and a metaphor analysis guided by the work done by Lakoff and Johnson (1980).

Gee (1985) restructures narratives into groups of "idea units" (Chafe, 1980) which resemble stanzas in poetry. Chafe characterizes these idea units as a single focus of consciousness within a larger story, similar to a single focus of the eye as it scans a scene. Also referred to as "spurts of speech," they are bounded by pauses or hesitations and have a single intonation curve which further helps in their identification. Stanza's sound like they go together, the clauses share content and topic, and are often distinguished through noticing repetition of certain words or other patterns. Gee believes these stanzas are a universal feature of speech.

I am aware that, in my own research data and in the data of others, noticing a narrators' use of metaphor is key to understanding how we accomplish making sense of our experience. As mentioned previously, the evaluative portions of our stories about past events usually contain reasons why we took certain actions, as well as justifications and rationales for our decisions. Often these evaluations are metaphorical in nature. For Kenneth Burke "every perspective requires a metaphor, implicit or explicit, for its organizational base" (Crocker, 1977).

Lakoff and Johnson's 1980 landmark book, *Metaphors We Live By*, asserts that most concepts we use to give meaning to our lives are basically metaphorical. These conceptual metaphors help us understand one kind of thing in terms of another kind of thing. How we do this is by grounding those concepts that are abstract, non-delineated and nonphysical, in terms of other concepts that are concrete, delineated and physical. The basic physical experience of moving our bodies about in space – how we interact with the physical environment -- provides many of the concepts we understand directly that we apply in order to understand other things metaphorically. While the physical up-down, front-back, in-out -ness of the world is sharply delineated, our emotional experience is not. So we create systematic relationships between our physical experiences, like the act of standing up, with our emotional experience, like feeling happy. Thus we create Happy is Up and Sad is Down metaphors. Lakoff and Johnson (1980) call these *orientation metaphors*. We also experience many things through our senses as having boundaries, an inside and an outside; we see them as substances and entities. When things do not have distinct boundaries, we create them by conceptualizing them as entities or containers. "Keep this in your hand" is not a metaphor, but "keep this in mind" uses the conceptual metaphor "the mind is a container." Metaphors used to view events, emotions, ideas, etc., as entities or containers are called *ontological metaphors.* Ontological and orientation metaphors are so basic to our thinking that we use them without being aware that we are speaking metaphorically.

The last kind of metaphor which I found were used frequently in the FC change study and this study is the *structural metaphor,* where one concept is structured in terms of another. Lakoff and Johnson use "argument is war" to illustrate this type of metaphor. What is important about structural metaphors is the power they have in influencing how we think and see the world, and how we behave. The "argument is war" conceptual metaphor is so entrenched in our culture (we win or lose arguments, we defend our position, our criticism may be right on target) that it makes it almost impossible to think of argument in any other way.

Summary

In this chapter I have described how this study is nested within the larger study of organizational change of the Foundation Coalition. I also distinguished how my data was collected and managed and the different methods used to analyze these data. In the following chapter, I present the foundation of my dissertation, the primary finding from the narrative analysis methods I have just described. I distinguish two dominant social or cultural narratives that constitute the context in which the participants in this study positioned their respective stories. They are a master narrative of the academy in which values and standards of behavior for professors and students are embedded and communicated, and a counter-narrative of reform, in which are articulated the ideals and goals of the Foundation Coalition and other curricular change efforts in engineering education.

CHAPTER III

A CONVERSATION ABOUT CHANGE:

THE MASTER NARRATIVE OF THE ACADEMY

AND THE COUNTER-NARRATIVE OF REFORM

> I had one guy, he said "Ultimately, at the end of the day…I'm not sure
> that this is going to work, given the culture of this field. You know… is it
> reasonable to expect engineering professors, kind of across the board, to
> teach in this particular way, when that goes against the cultural grain?"

Around the fifth year of the FC, as the management team was encouraging the FC teams at partner institutions to institutionalize their new curricula, they were beginning to realize that change was not occurring as rapidly as they had planned, and that there was considerable resistance to mainstreaming the new curricula (Froyd, Penberthy, & Watson, 2000; Froyd & Watson, 2000; Watson, 1999; Watson & Malave, 2000). FC teams encountered resistance in several areas. One was with the new pedagogy. According to the professor quoted above, the teaching innovations introduced by the FC faculty went "against the cultural grain" of engineering education.

In the quotation a member of the change study research team is paraphrasing a casual conversation with an FC campus leader. I've included it here for three reasons. First, it introduces the notion of a "culture of engineering education," a notion that can be traced back to NSF's originating documents for the education coalitions. Though never defined, the culture of engineering education became the target for reform and thus a recurring theme in FC reports and documents[1]. I believe it was an oversight of the FC leaders not to take time in the beginning of the project to reflect on and come to

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[1] There is no documentation of what the NSF and the FC meant by the "culture of engineering education" exactly. We can only infer it from what they articulate as its replacement. While reasons for the change were many (industry noticing new graduates lacked teaming skills and other "soft" skills related to interpersonal relations) there were no assessment or evaluation data used to justify changing the status quo. This lack of data would be used often by opponents to reform, saying that there were no reasons why the way they taught needed to be changed.

understand how a "culture of engineering education" is manifested in behaviors, values and beliefs.

Secondly, analysis of the speaker's use of "grain" as a metaphor shows how much power is attributed to the "culture of this field," and how easily it can be given as an excuse for any unsuccessful reform efforts. The speaker uses "grain" as a structural metaphor to characterize "culture." Culture, as an attribute of the "field" of engineering education, is something of which one is a part, similar to being a part of the field of engineering education. What one does or does not do is directed by the grain. Going "against the cultural grain" literally refers to doing something against the way things are done in a given culture. It implies that there are aspects of cultures that are essentialist. It connotes going against a natural *cultural* tendency, or against the essence of a culture. We may be part of a culture, but culture also resides in us. During socialization a culture is "in-grained," it becomes "part of the essence," "thoroughly worked in," and an "innate" part of that individual, group or "field" (Mish, 1996). The speaker being quoted (or paraphrased) here is saying: "It's unreasonable to ask engineering professors to teach in any way that is different from the way they have always done it, *because* the way they have always done it is part of their culture and therefore ingrained. And, as a part of culture, to change it would be difficult, if not impossible. Can you change the direction of the grain in a piece of lumber?"

But simply attributing an individual's behavior to their membership in a particular culture does not get us any closer to understanding that behavior, nor does it contribute to our ability to influence it. Culture is a word that for many academics, myself included, just comes too easily and too often when we attempt to explain a particular phenomena, like the engineering professor did in the quote at the beginning of this chapter. In order to avoid that pitfall, Harry Wolcott requires that his beginning anthropology students "write without culture," that is, write without using the word "culture." This helps to ensure that culture is never used as "an explanation for behavior" (Wolcott, 1999, p. 253).

Lastly, in the quote, the speaker sets up a conceptual duality. "Teaching in this particular way" goes "against" an implied way of teaching that is the norm of the "cultural grain." The new way violates the rules of the norm. There is a tacit agreement between the participants in the conversation about what the norm in teaching is, and the

professor being quoted doubts if the new way will work. In fact, there seems to be a whole set of implicit presuppositions shared by the speakers about the old and new ways of teaching in these few sentences. These presuppositions are embedded in a *master narrative* of academia and a *counter-narrative* of reform whose storylines differ in how *it is,* and *should be* in the classroom. As Farrell et al (2000) put it, there are "stories we tell ourselves" in local narratives and "stories that tell us" in more global narratives.

> Master narratives define rights and duties and incorporate the values of dominant social and political groups. Their unexamined taken-for-granted assumptions about how the world is and ought to be conceal patterns of domination and submission. Like all narratives, these are selective representations, excluding experiences and views of some sectors of society while including and privileging others. Their legitimating function may be resisted and subverted by counter-narratives reflecting these excluded perspectives. (Mishler, 1995, p. 114)

Master narratives originate from tradition. In many ways, a master narrative is like a "sacred story, in that "it constructs ideals and prescribes rules of conduct, provides a source of authority, and above all, gives a sense of continuity and purpose (Postman, 1996, p. 5-6). One of the primary functions of master narratives (or dominant narratives) is that they "offer people a way of identifying what is assumed to be a normative experience" (Andrews, 2002, p. 1). The story of the FC can be viewed as an attempt to re-narrate the master narrative of academia as it is manifested in engineering education. The vision of the FC, as it described the ideals of a new culture of engineering education, became a counter-narrative that challenged the norms and truths upheld in the master narrative.

The Conversation about Educational Reform

The counter-narrative of reform is embedded in the stories of FC faculty as they talk and reflect on how their behavior and values no longer reflect the master narrative with which they are familiar. As they worked to make the vision of the FC a reality, they were challenged to find meaning in their work outside the storylines available in the master narrative. Therefore, the counter-stories that were collected in the FC change study and this study were always juxtaposed or contrasted to the academic master

narrative. Sometimes this was done explicitly. But often the norms of the master
narrative existed as a tacit presupposition shared between the speaker and the interviewer.

Counter-narratives always exist in relation to and in tension with the dominant
narrative. Any pronouncement emanating from a counter narrative, written or spoken, is
framed by the master narrative to which it offers an alternative, i.e., "takes place against
the background of a world that is silently taken for granted" (Berger & Luckmann, 1966,
p. 152). The counter-narrative of reform in engineering education can only exist in
conversation with the master narrative of the academy that maintains the status quo.

In using "conversation," I am borrowing a concept used by James Gee (1999),
who as a linguist, sees the world in terms of discourses, social languages and
conversations. He views language as both a supporting framework for, and a way of
acting out, aspects of our world. For Gee, language-in-use is "everywhere and always
political" (p. 3) meaning that when we speak or write we are also speaking or writing
from a point of view on how we believe "social goods" are or ought to be distributed.
"Social goods" are "anything that a group of people believes to be a source of power,
status, or worth" (p. 2). For example, social goods in academia are those credentials that
count towards promotion, like grants and publications; or concrete things that contribute
to professorial productivity, like laboratories and graduate students.

Gee distinguishes *Conversation* from an ordinary conversation between two
people. A *Conversation* is characterized by the following qualities:

1. It is controversial, there are identifiable "sides" engaged in a debate
2. There are values and worldviews attached to the debate
3. There are objects and institutions engaged in the debate that take on
   "symbolic" value

For instance, the quantitative vs. qualitative debate about research is a
Conversation between opposing camps of academics lined up on epistemological,
ontological and methodological sides, where disciplines will often take on symbolic
value. Each side has a distinctive rhetorical and discourse style, and most academics
have no problem easily identifying which camp their colleagues belong to by the way

they speak. The same is true with the dialogue regarding reform within engineering education.

In the rest of this chapter, I use "conversation" (with a small 'c') to refer to the exchange of ideas, opinions and information about the issue of reform as it takes place in various vehicles for communication. It is in the conversation that the values, beliefs and behaviors of both the master narrative of the academy and the counter-narrative of reform become evident. The kind of talk that takes place in interviews, or the language used in organizational documents can be part of the conversational apparatus for both narratives, and it is through these mediums I will distinguish the two narratives.

The counter-narrative of reform is an attempt to *re-story* undergraduate engineering education as well as the occupational life story of the engineering educator. The setting and the protagonists are the same, but the goals, the action and the means by which the goals are attained are quite different. The sides of the debate within the conversation become apparent in the metaphors used by participants, characterizing the debate as a struggle between opponents, sometimes at war, sometimes in competition.

Waging War: Cultural Revolution vs. Conserving the Past

One element that helps distinguish the call for reform in engineering education as a *counter*-narrative is the declaration that the needed change should be "systemic," a "cultural revolution" or a "paradigm shift." This is not just incremental improvement or a gradual change of one part of the system at a time, but a complete overhaul, replacing an old system with a new. The engineering education call for curricular reform is one version of a reform narrative in higher education that has been going on for many years. Framed within the reputation that change in higher education is difficult, if not impossible, the conversation about reform is sometimes portrayed as a heroic struggle formed on "battle lines" between young teacher-professors advocating new, up-to-date innovations versus older, more traditionally-minded professors defending the status quo. Our interviews in the change study as well as my interviews for this dissertation are rife with comments about the difficulties FC faculty experienced in persuading others to accept the curricular and pedagogical changes in the new programs. These faculty came to see what Miller (1998) characterized as an "inescapable situation" related to reform

efforts in higher education: "the academy is not simply a set of administrative, curricular, and pedagogical practices; it is also the people who have been captured and rewarded by those practices" (p. 201). He further describes the situation:

> We have also seen that while it is certainly true that changing administrative, curricular, and pedagogical practices may alter the experience of higher education for those who enter the system in the future, such changes are unlikely to be seen as desirable by those already resident in the system. And because those already in the system will tolerate only incremental adjustments to their working conditions, the struggle between those who seek to reform the system and those resistant to such change almost naturally gives birth to a rhetorical world where endless calumny gets heaped on those whom the system rewarded in the past—they are lazy, old, ignorant, behind the times, immoral, angry, bitter—and unrestricted praise gets laid at the feet of those about to enter the system—they are honest, hard-working, the best and the brightest, dedicated, patient, thoughtful, sincere. With the battle lines so drawn, those interested in radically altering the bureaucratic delivering of higher education are left with very few options beyond wishful thinking: if only all the people already in the system could be retired or "reeducated," if only an alternative educational regime could be established, if only jobs could be created elsewhere for our students, then it would be possible to achieve economic parity, a measure of social justice, a more humane educational environment, a cultural revolution. (Miller, 1998, p. 201)

While the current call for engineering education reform started in the late 80's, by 1997, the focus had become more defined. The version in the following passage is taken from *The Action Agenda for Systemic Engineering Education Reform: Guidelines for Submission of Proposals* (National Science Foundation).

> As this century draws to a close, the environment for engineering practice is changing dramatically and irreversibly… Employers emphasize that success as an engineer increasingly requires, in addition to strong technical capability, skills in communication and persuasion, ability to lead and work effectively as a member of a team, understanding of the non-technical forces that profoundly affect engineering decisions, and a commitment to lifelong learning....
>
> Acquiring such characteristics is unlikely with traditional, lecture-based instruction. *A new engineering education paradigm is needed,* characterized by active, project based learning; horizontal and vertical integration of subject matter… and a faculty devoted to developing

emerging professionals as mentors and coaches. NSF's investment in Engineering Coalition and Curriculum and Course Development activities totaled about $170 million over the period FY 1991-1997…. As a result, many innovative approaches to engineering education are now available…. However, *their widespread adoption* throughout the engineering education community has been, in most cases, quite limited. Most observers agree that the current academic culture and reward system discourage development and implementation of educational innovations and the *adoption of new educational paradigms*.
The Action Agenda for Systemic Engineering Education Reform described in this announcement seeks *truly innovative* approaches to break through this implementation barrier. (emphasis mine)

This articulation of the reform agenda promoted by the NSF is a striking example of the oppositional stands expressed in the conversation between the counter-narrative of reform and the master narrative of the academy. Core values of each narrative are categorized under "old and traditional" and "new and innovative." The "traditional" method cannot impart the skills needed by future engineers. Adopting what is "new" and "innovative" is being thwarted by the current culture. It exemplifies the adversarial stance these narratives eventually assumed. Reading between the lines, it also is a covert scolding to the recipients of that "$170 million" for the "limited" adoption of their "innovative approaches." The writer, as the omniscient voice of the NSF, avoids including a personified National Science Foundation as one of the "observers" proclaiming the "academic culture" the main "barrier" to the "adoption of new educational paradigms." It isolates two aspects of the academic culture as clearly a target for change, the "traditional, lecture based instruction" and the "reward system." Taken literally, it appears that the NSF is moving the target of change from curricula to the entire culture. The "barrier" this culture presents necessitates a more aggressive means by which to "break through." Being "innovative" is not sufficient any longer, what is needed is "*truly* innovative."

The Foundation Coalition's formative documents like the vision and mission statements also echo the call for culture change. I suspect the FC Management Team modeled themselves after corporate "best practices," and created vision and mission statements at some point early on in the history of the project. The purpose of these statements was to articulate what the Coalition was basically about: its aspirations, core

values, and reason for being. In essence, the process of creating these texts, and the dissemination of their wording in publications, web pages and other organizational and bureaucratic documents were part of the act of organizational culture-creation, a clear statement of beliefs with which faculty could align.

The vision of the FC for the first five years of the grant was:

> A new culture of engineering education – students and faculty working together in partnership to create an enduring foundation for student development and lifelong learning. (Frair, 1995, p.5).

The concept of creating a new culture was not just some pompous verbiage relegated to formal organizational pronouncements. Many of the FC faculty "owned" that goal and had a clear concept of what "culture change" meant, as shown in the following excerpt from a change study interview with a faculty member who taught in the FC program:

> …it comes back, I think, to what we threw out on the table when we first got this. It's not so much what you're going to teach or how you're going to teach it, it's the philosophy that you bring to the table about what is important in the processes of teaching and what do you do to cultivate those people who can buy into that new culture. It's the cultural aspect of teaching engineering that has to be revolutionized, not the content of the course.

The academic culture is not like the sound barrier that can only be broken through with increased velocity and impulsion, nor is it like the Berlin Wall, that once torn down allowed in all who wanted entry into the West. For a paradigm change, culture change, or a scientific revolution to occur, the existing paradigm, culture or theory needs to not *work* anymore. There needs to be a recognized crisis that the existing worldview cannot resolve (Kuhn, 1996). As I will show in the following pages, the master narrative of academia, as it is re-presented in conversation with the reform narrative, expresses adamantly that nothing is broken, there is no crisis, and there is no need to change. Most researchers who have studied change in organizations agree that a prerequisite to any successful change effort is a consensus among the individuals who will be affected by the change, that the change is not only needed but necessary.

In the beginning, the engineering version of a "new culture" meant total revision of the undergraduate curriculum, radically altering the way teachers taught in the classroom, and the introduction of an ongoing assessment and evaluation system of individual courses as well as programs. Teachers would become more student-centered (rather than focus on content), students would work on teams and form learning communities through cohorts and study groups, faculty and students would work together to help students assume major responsibility for their learning. Early in the FC the means by which they were to accomplish this was through four "thrusts" related to curricula: course integration, active and collaborative learning, technology-enabled education, and assessment and evaluation of students, courses and curricula.

Sometime after year 5, the vision statement changed to what is currently on their web page:

> [The] Foundation Coalition will be a recognized leader in creating a new culture of engineering education that is responsive to technological changes and societal needs (Foundation Coalition, 1998).[2]

At that time, FC faculty and leadership had several pilot programs ready for scaling up for adoption, they had considerable experience developing and implementing several innovations, so public statements about their work evolved into more refined and specific articulations. The four "thrusts" were elaborated upon and became the "core competencies" needed to realize their vision: active and cooperative learning, increasing women and minorities in engineering, use of student teams in learning situations, introduction of computers and other learning technologies into the classroom, "continuous improvement" through assessment and evaluation systems, curricular integration and competency in organizational development and change. Acquiring these competencies and implementing these changes would be guided by five "core values" regarding their behavior as educators and engineers: excellence, responsiveness, inclusiveness, partnership and accountability.

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[2] While I did not focus on this change of vision for this study, I do think it is interesting to note that the focus for the first five years of creating a new culture of engineering education turned into a focus on the FC being recognized as a leader in that endeavor. It corresponds to their activities changing from curricular improvement to marketing what they had created. In later chapters, I will show how this vision change was experienced by some faculty leaders.

There is nothing discipline-specific mentioned in any of these foundational proclamations, no reference to the current manner in which engineering education is offered, nor any rationale or argument for why engineering education needs such radical change. A challenge offered from the master narrative then became one theme of the conversation: Why change? What's wrong with the way we have been doing it? Rather than responding with a good argument for change, supplemented with student performance data or industry rationales, the FC faculty attributed the resistance to "tradition" and "laziness," or a major "a philosophical conflict" between the reformers and the "rank and file faculty" or the "old guard." An administrator told us,

> There's just a certain number of particularly the older faculty, I'll be age-biased here, who said "This is the way we've always done it and this is the way it was done for me and it worked for me, how come it can't work for them. Why should we change it. It's the student's fault. It's their attitudes, it's their parents, it's the society."

FC faculty members were acutely aware of some of their colleague's dismissal of the idea that change in any way was needed. One chemistry professor told us in the change study that the proposed new sophomore curriculum was never given any serious consideration in his department:

> I don't think that the department ever made a conscious choice and said, "Let us look seriously at what this is and how it would benefit our students and make a decision about it… we have a curriculum. We're happy with it. If it's not broke, don't fix it."

Another professor perceived that even the use of the term *reform*, "waved a red flag in front of the faces of those who believe everything is fine."

> [B]ut engineers, by their very nature, are relatively conservative folks. I don't mean politically conservative, but I mean "if it's not broke, don't fix it," mentality is pretty strong, particularly in education. There are a lot of people who believe "it ain't broke." They think "if it was good enough for me 20 years ago, that's what we ought to be doing now." That's still a pretty strong thread…

This "strong thread" that there is nothing "broken" in engineering education may have been instilled in the socialization process of professors during their graduate training. "Students learn to conform to their professors' beliefs and the normative expectations of their program and, at the very least, passively accept faculty ideology and world views" (Weidman, Twale, & Stein, 2001, p. 60). Questioning the status quo, which is certainly inferred behind every change initiative, represents a complete break with the past, therefore discredits the past, and thus invalidates the manner in which most professors were trained.

But the reform narrative did more than question the status quo, as a counter-narrative it attempted to change it. The implications this had for departments and colleges were not clear in the beginning. Some FC faculty teams treated the NSF Coalition proposal like any other research proposal; wait to notify colleagues, department or college as appropriate, if you have been awarded the grant, not before. At one FC institution, this started the team out on the wrong footing with their colleagues:

> It's okay to [change] for one or two workers who are going to build a specific thing for their course or their laboratory, but if you're talking about introducing an educational model that is going to fundamentally change the way an institution does business, you better talk about that conversation before you take the money, before you even ask for the money. I believe all of us who were here in that era are very sensitive to that kind of thing now. So that is the advice that I give the institution. Avoid going places just because the money is available. Decide what you want to do with your institution and then go and find the money. Have that broad conversation early. If it's like a fundamental paradigm shift, if it's a fundamental change in the way the institution does business you better talk first before you shoot.

Others made a concerted attempt at getting faculty support from the very beginning before proposals were submitted:

> …before we sent the proposal in - we trotted around to curriculum committees and said, "Are there any reasons we shouldn't put this in to try to get money?" and they said, "No. We'll work with it if we have to." And besides, we set it up as a pilot. We want to pilot this and then about a year after the first pilot, we will get together and decide how to change the pilot or how to adopt it or what. So nobody has to do it, but let's go look. And I

think there's always in the back of the mind of anybody who's got to
decide to do something before a proposal that there's a reasonable chance
it won't get funded. So it's OK to say "yes. I don't have to fight the hard
battle now. Then if they get the money, well we go to the pilot and then
we'll fight the hard battles if we have to." But it allowed us to start
because if there's one thing I've noticed about faculty, as a group, not all
faculty do this so it's important not to stereotype but none the less, [there
is] a tendency to decide in a way to minimize risk of failure. Not to decide
in a way that maximizes the opportunity to succeed, or the possibility of
success. But rather, it's risk avoidance. Which means it's very hard to try
something new because there might - you know the one that's there is
already working. Don't mess with it.

Philosophically, the goal of the reform narrative was to transform the academy.
But when the effort got underway, and people were actually trying to do things
differently, the effort became war-like. As we saw in the previous two quotes by the
expressions "talk before you shoot" and "fight the hard battles," the "waging war"
metaphor was used often by professors in the interviews for the change study.
Individuals for reform and against reform were placed in separate "camps." Campus
leaders were referred to as "champions" and "flag wavers." A faculty member
characterized an administrator's strategizing as "how many people do I need to deploy in
this army to do this?" Faculty who worked on curriculum development teams "gave their
lives" for the cause. There were incidents between faculty members in opposing camps
within departments that occurred "in the heat of battle" and were often "bloody."
Attempts to persuade departments outside of engineering to participate were like "waging
war." One campus leader told us he realized too late that the war metaphor was not
helping their cause, that it should have been more like an invitation to "play,"

What we should have done early in the project was, "[Joe], let's see how
we can play together." No! We were going to beat [him]. Well, [Joe] is
the Associate Department Head, so you could win a few battles, but the
war, he is going to win. Well, he won the war.

Though the war metaphor predominated at some institutions in the FC, others
viewed the relationship between the reform narrative and the master narrative as more of
a competition, sometimes in terms of business (getting "buy-in" from faculty,
"marketing" the innovations, making "trade-offs" in the implementation of new

curricula) or in terms of sports (faculty volunteered by "coming up to bat" or were "willing to go to the mat"). No matter what the metaphor though, the counter-narrative of reform and the master narrative of the academy were at odds striving for their particular worldview to be dominant.

For individual faculty members, participating in the FC meant "breaking the rules of the game" dictated by the master narrative. In the next section, I will examine a major issue for faculty as they incorporated the beliefs and worldview of the counter-narrative into their own personal value systems: how could this work in curriculum be rewarded?

Playing the Game: Breaking the Rules vs. Playing the Game Right

> Everybody wants to win tenure and professorships and they're going to do what is required. And right now that's money in, papers out and lots of PhD. students.

Professors use the game metaphor often when talking about what they do as professionals. Games have rules which function as frameworks for "game" behavior when playing. In order to succeed in academia, one must first learn the rules and then be willing to play. The master narrative of academia's primary function is to communicate and reinforce the rules (which communicate tacitly the values) of the academic game to those entering and those already in the system.

> Behind the curtains of official university practices lurks a vast unofficial and tacit system which – on its part – steers the functioning of the whole university. To survive and succeed in the university requires not only scientific aptitude and abilities but also picking up the hidden norms and the rules of the university game"(Ahola, 2000, p. 5).

In their study of women in the academy, Aisenberg and Harrington (1988) found that women had difficulty "playing the game" in academia which, for them, meant doing work that was required to get promoted rather than "something that you really thought was useful, necessary, and worthwhile…worth doing." FC faculty expressed having similar dilemmas. They were torn between doing something they believed was of value or doing what was needed to attain promotion. As the professor quoted in the beginning

of this section said, everybody "wants to win" and the rules are, "money in, papers out, lots of Ph.D. students."

Competitiveness is a major characteristic of the academy. Faculty members compete for scarce resources, publications in prestigious journals and tenure-track positions. Institutions compete for students, nationally renowned scholars, and top rankings. Donald Kennedy, a past president of Stanford University, describes the scenario succinctly in his book *Academic Duty* (1997). He asserts that the state of higher education in the United States as one of "compression: of enrollment, of funding, and of opportunity." Therefore,

> [A] static number of professors is being asked to respond to elevated
> expectations: students now both want and need more academic attention
> and challenge than did their predecessors; universities require more
> committee work and participation in governance; and with a constant
> funding base and a limited number of tenure faculty slots, each aspirant
> has to do more to qualify competitively. (p. 30)

The quality of an institution is measured on the basis of national reputations of faculty members. Since research productivity and not teaching ability is the "primary reputational currency," attaining promotion or tenure means concentrating on research activities, often to the detriment of teaching. "Meanwhile the public, which looks to higher education primarily for teaching, is beginning to express concern and even mistrust over the universities attention to its primary mission" (p. 30).

The FC effort broke many of the rules of the academic game implicit in the master narrative, the most obvious asking faculty to treat undergraduate education as a high priority, where the norm in the research universities was to most value graduate education. Most activity in the FC concentrated on improving freshman and sophomore year curricula, the "foundation years" for engineering students. The process of developing, piloting and implementing these programs was very time consuming. Even once these courses became institutionalized they gained the reputation as "tenure killers" because teaching them tended to demand more time and effort from faculty. At TAMU, pro-FC administrators attempted to "change the mentality a little bit" by attempting to instill in faculty that nothing "can be more important than teaching the fundamental concepts to our undergraduate students." Yet there was no effort to adjust the reward

system to reflect the new values. While enrolling some senior research faculty to teach the courses may have lended credibility to the program it did little to address the problem for junior faculty still climbing the promotion ladder.

Yet many faculty members naively believed that their work in the FC would be recognized on merit alone. After all, partner institutions shared the coalition grant of over $2-4 million yearly over a 5-year period, and while only one Principle Investigator could be listed on the grant from each partner institution, the entire project had been a team effort from day one. But counting faculty members' work in the FC toward promotion was the exception, not the rule. Only at Rose-Hulman, the only technical school in the Coalition was the situation different. Instead of research, "professional development" activities counted along with the traditional teaching and service, and the early development work counted as professional development.

Most FC faculty had put their individual research agendas on hold in order to participate in the change process. Many were aware that the intrinsic reward that came with the knowledge that they were improving their program came at a cost. It was rare that work in the FC contributed to someone's promotion package, and non-tenured faculty were not invited to participate for just that reason. It was assumed that their work would "count" in the teaching category, but even that could not be depended on in some departments as shown in the following interview excerpt:

> *Interviewer*: But in terms of promotion and tenure. When you review a dossier of faculty going up for tenure, do you as a department head, value their participation in the Coalition?
>
> *Department Head*: That's a really difficult question because you know; basically we're a Research I institution… and the two main things are teaching and research. The question is, on the teaching side, is it service or is it helping the department? And you know, is it pushing new frontiers for the department? Obviously it's not pushing new frontiers. Its bringing new technology in which we hope will be reflected in some of the other classes. Do I give special credit for it? No. Do I expect them to give service? Yes. And if I were to look at the way that you weight things, teaching would have a big "T". They've got to be very good teachers. OK? Research. They've got to be excellent researchers.
>
> *Interviewer*: Right.

Department Head: Service, small "s".

Interviewer: So you see this as service?

Department Head: This is service.

The following comments from a professor we interviewed in the FC change study are quite candid about his experience of "management's" expectations of faculty.

> [M]y colleagues…are highly skeptical…The reasons are not necessarily because of the coalition. It's more of the tradition of the department…Well there is much resistance to changing things [from the way it was done] in the past if it takes more time and more care with the students. Because it's been made loud and clear that we're here to write proposals and bring in money. And there is a certain amount of lip service paid to the education of students, and they do the best they can with the time that they have. But management demands that we bring in a certain amount of money and if our quotas aren't met, then we don't get paid in the summer and so you have to hustle to do that and that's what they want us spending our time on.

The counter-narrative of reform in engineering education elevates higher education's accountability to the public and to industry by placing a high value on the education function of the professoriate. This increases the perennial tension experienced by faculty between the institutional and disciplinary pressures to do research and the demands of teaching. Professors who enjoyed teaching and who were committed to student learning were attracted to the Foundation Coalition. Many were intrinsically motivated to improve undergraduate programs and welcomed the opportunity to improve their teaching and their students learning. Participating in the FC took time away from individual research agendas, and thus, for many, put on hold their advancement up the career ladder. But they valued their work, and believed it was important and making a difference. They were also aware that the current "system" of promotion and tenure would not "count" their work in teaching and curricular innovation towards promotion. It was a huge problem and a continuous topic of debate from the very beginning.

Another issue I found as a focus of the conversation between the master and reform narratives is related to the disciplines and the push towards specialization within the disciplines.

Protecting Your Turf: Disciplinarity and Specialization vs. Integration

Another conflict that is seen in the conversation is between the nature of academic disciplines, what I call *disciplinarity*, and the values embedded in the concept of curricular integration. One of the main "thrusts" of the FC was integration of subject matter, not only across the sub-disciplines within engineering, but also across disciplines outside the colleges of engineering that were traditionally taught in the freshman and sophomore years. Faculty in the FC spoke about both "horizontal" integration, making linkages with courses taken simultaneously in a semester, and "vertical" integration, assuring continuity with courses students take before and after a particular semester. Helping students make "the connections" across subject areas and "see the big picture" caused faculty to form partnerships with engineering colleagues outside their departments and with professors and other teaching staff in Math, Physics, Chemistry and English. One of the FC core values is "partnership," where among other things, "faculty redefine their relationship to the students and to each other across disciplines."

When successful, this "redefined relationship" challenged a long lasting and very strong tradition of separation between disciplines, and even departments within a discipline. The academic structure is set up to support a narrow disciplinary focus:

> Because departments and professorial reward systems are organized to pursue specialized teaching and research, and because each department covets all the enrollments, faculty members and research monies it can get, any change proposal which is perceived by departments or their individual members as threatening these basic interests is in for a rough time. Any innovative program which "borrows" faculty from departments, as many do, soon finds that departmental interests come first. (Lindquist, 1978, p. 134)

As we can see in the following quotations from the interview texts, the two sides of the conversation devoted to this topic pitted "helping students make linkages across topics" against wanting students to form a "disciplinary identity" from the beginning of

their freshman year. The "blurring of disciplinary boundaries" "re-ignited turf issues" and "a lot of the resistance was territorial." The "territory" in many cases was departmental-specific courses that would be eliminated with more generic introductory engineering courses which threatened departments' ability to recruit students. The war metaphor appears again in the following excerpt from a professors' interview:

> But there's always a struggle with individual departments. If you're going to be an "XYZ" engineer, then you need to have them building left-handed widgets as a freshman, because if you don't get it there, you'll never get it. And that's a continual battle.

From an administrative point of view, departments, consisting of one of more disciplines, are the basic organizational units of academia, and have more authority over faculty behavior than colleges. Larger institutions tend to have greater disciplinary distinctions, thus more departments and greater stress placed on disciplinary knowledge. There is increasing pressure placed on graduate students and new faculty to specialize by focusing on smaller and smaller areas in their research area. A familiar joke about the meaning of doctoral status is that a professor "learns more and more about less and less." The move toward greater and greater specialization has even effected undergraduate education, where core courses or generalist courses give way to discipline-specific introductions to the field, as one professor explained it, "more and more faculty wanted to make a focus of their particular discipline down further and further in all of their courses, and as they began to teach fluid mechanics for chemical engineers as compared to fluid mechanics for civil engineers …it became very specific and narrow" to the point of wanting "to get our majors engaged in the freshman year."

This "disciplinary parochialism is said to interfere with the aims of undergraduate education" (Harrington, quoted in Storer, 1991, p. 207) and certainly interferes with cross- or interdisciplinary work. Many of the FC integrated courses depended on engineering faculty to be at least moderately versed in the commonalities among the engineering disciplines. These courses were difficult to staff, they were "too hard to teach," and meant faculty brushing up on some basic principles in a way that could applied to engineering in general. The reform narrative, as illustrated in the following

quote from an administrator at an FC partner institution, advocates a much more holistic and unified approach to introductory engineering education.

> And I would like the teachers in the [FC] program to be kind of generic. I would like for them to be faculty of the College of Engineering without a label on them saying "Civil" or "Mechanical." I don't believe the faculty wants to give up that identity, I don't believe we are going to cultivate faculty from programs here who would be content being a general engineering faculty member. So to me, that represents the biggest continuing challenge to departmental acceptance of the [FC] program among our faculty -- looking for a champion who would get in there and play the generic engineering game with the idea that they want to help students.

Strong faculty partnerships were formed in the FC programs and they were a source for much satisfaction for the professors involved. But many did not experience support for this kind of work from their "home" departments. A chemistry professor saw it this way, echoing the war metaphor we saw in the last section:

> The university is composed of colleges, call them the nation and the colleges are composed of departments, call them tribes. Tribes, because tribes like to throw spears at each other. And if you cooperate with another tribe then you are an enemy. So I am a dire enemy because I cooperate with the engineering nation and tribes. That's very bad. So the way this university…the departments don't look to see what they can do to improve the university, the departments look to see what they can do to improve themselves, even if that's to the detriment of another department. And you get the same thing with the colleges. And I don't know that anybody wants that, but it's empires.

It is in this area of integration vs. disciplinarity where the FC has experienced perhaps their strongest barrier to reform. The worldview espoused in the academic master narrative is supported by a very strong administrative and bureaucratic structure. It is not just a value system the reform narrative needs to address but a structural system as well.

Ranking and Hierarchy: Position, Power and Partnership

The master narrative of the academy legitimizes a strict academic hierarchy. An individual's position in the hierarchy determines how many demands are placed on them

from others, their work priorities, the freedom to pursue personal interests, and the freedom to express oneself without fear of damaging one's ascent in the system. Each ascent in the hierarchy comes with more money, prestige, freedom, self-esteem, and personal space. Departments wield various levels of power, due to prestige associated with a discipline, its size within the college, the amount of research dollars it generates, industrial demand for their graduates and prospective income, tradition within the college, grants or research centers, and faculty research reputations. An individual's position in the hierarchy is usually known by others.

> One of the striking features of academic life is that nearly everything is graded in more or less subtle ways. People are quite open in designating the leading journals in their discipline, about which there is virtual unanimity; they are willing, when pressed, to list institutions and departments in order of intellectual precedence; there is a constant process of implicitly and explicitly ranking of individuals (the outstanding scholar, the student with the 'first class mind', and more often the implication or omission, those who are less well regarded. (Becher, 1989, p. 23)

The values and resulting behaviors that professors use to guide their activities flow from an institutional value system embedded in the master narrative that defines quality based on what some call an "elitist" model of higher education institutions. Universities, especially research universities, emulate the "top ten," who

> …enjoy the most social and academic prestige; the fattest endowments; the 'lion's share of federal and foundation grants; the brightest students from the "best" families; and the famous faculty who spend their days teaching apprentice scholars their disciplines, pursuing personal research interests and picking up second incomes consulting with every other American institution. The rest of us were trained and socialized to crave positions in such places, or failing that, to make our institution the Harvard or Amherst of our particular geographic area. The lighter the teaching load, the more the system supports and rewards publication of scholarly research, the more academically capable and committed the students *when they enter* college, the more disciplinary the curriculum, the tougher it is to get high grades, the more graduate school oriented the program and the more administrators, students and budgets serve the interest of independent professor-scholars, the better (Lindquist, 1978, p. 56).

The following quote is from an interview I did for the change study. The speaker (R), a woman, is talking about an exchange she had with a professor who attended a training workshop that introduces a new way of teaching freshman engineering design. The exchange referred to takes place after the workshop while many of the attendees are talking to the workshop leader at the front of the room.

> R. So at the end of the session, you know, people are surrounding him, they're all asking questions, and there's one poor little guy, and he's got to leave, he can't wait to get his question in. So, he comes to me at the back of the room and he says "I'm really bothered by this. If you tell the students what they're supposed to learn, they're all going to get 'A's." (Laughs) And I thought, "Well, duh!" I thought how do I answer this poor man? He really believes that giving all 'A's is going to be wrong and I'm sure that the administration is telling him that this is grade inflation, all those things that we hear about and see in the news.

I. *It's indicative of the culture*.

The element in the new course which "tells the students what they're supposed to learn" is a competency matrix, a listing of the knowledge, skills and abilities and the levels at which students are expected to acquire them. In the interview, my response to this story is to declare how the behavior of the "poor little guy" is indicative of the culture, meaning the academic culture. In fact, I refer to "the culture" quite frequently in this particular interview, introducing the idea about half-way into the 90 minute session. I did not need to explain what I meant, it was clear what I was talking about, and I sensed a tacit agreement among us that, yes, indeed, the "academic culture" was a powerful force in the lives of faculty. In this particular passage what I believed was indicative of "the culture" is what the "little guy" believed about grading and the interviewee's belief that an academic hierarchy was reinforcing it.

Both social narratives are re-presented in the conversation in this passage. There are representatives from both sides of the debate, the speaker, obviously an advocate for reform, and the "bothered" professor, symbolizing the academic master narrative. There is controversy over how to grade students. The speaker views the professor with some disdain, belittling him by referring to him as "one poor little guy" and "poor man." In fact, she never uses the term "professor" at all. She is somewhat incredulous about his

discomfort with the idea of giving all his students "A's." This is shown by her laughter, finding the "little guy" funny, and her allusion to his ignorance, or perhaps stupidity, by her using the current slang expression, "well, duh." She doesn't know how to "answer the man," again emphasizing how outlandish his position is. And lastly, she assumes his beliefs are related to an acquiescence to administrative views related to grading, (perhaps kowtowing to authority) that is echoed in the press, another kind of authority or sign of validation about the wrongness of grade inflation.

There are several things the speaker is doing in this passage. She is defining the two sides in the conversation by pitting a more open, communicative teaching role for engineering professors against the traditional role of ranking students with the conventional grading system. She is aligning herself and the professor on opposing sides of the issue. She is asserting the superiority of her side -- the reform narrative -- by creating the professor, the symbolic representative of the academic narrative, as "less than" – he's to be pitied, he is little, he listens to the administration. And lastly, she is enrolling me into colluding with her about her viewpoints. She has good reason to assume I would align myself with her. First, there is a tacit complicity between us because of our gender talking about a discipline that is traditionally male dominated, . I doubt she would have used the expression "poor little woman" had the professor been female, or had the interviewer been a male. Second, I did not take a neutral stand in the Conversation that found a forum in the FC change study, and that became clear early on in the interview by my reactions to their comments. We co-created in that interview a "safe" space to share anecdotes and stories that derided the academic grand narrative.

Going back to Gee's definition of politics, there is a political aspect to this passage as well. In schools, grades, or other means of ranking like faculty titles, are "social goods." The higher the grade conferred, the higher its value. High grades can be cashed in for privileges, like the right to enroll in honors classes, or the right to advance to the next classification. Students with high GPA's are often singled out and honored, so their status is raised among their peers. And the ability to confer grades, to rank students in relationship to each other, confers power to the professor. If the students all had an equal opportunity to receive the highest grade, the grade would lose its value, and

the professor would lose some of his power. The professor was not concerned about his students learning, he was concerned about losing some power.

A strategy used on one campus was to actively recruit senior researchers, full professors with prestigious reputations, to teach in the new program. They were referred to as the "bell cows" - where they go, the herd will follow. It was not so much "what" the story of the FC was, it was "who" did the communicating that got attention.

> There was one civil engineering department member who was involved in the curriculum in the first year…and [he] was a very good participant and contributor to that. I don't ever know that he went back and told his colleagues. To the best of my knowledge he didn't go back -- I have no knowledge that he went back and said this is not something we should be involved in, by any stretch of the imagination. [He] was also an assistant professor with no -- and we ran into this in the math department. The very first year we had two assistant non-tenured [professors] that when they went back to their colleagues and talked about it, they said "Well, who are you?" And that was a mistake. The next year we brought on [two established researchers] who were senior professors in that department and at least could speak from that venue. And they made pretty much the same decisions, but that was not the case. And so civil didn't have anybody of that stature.

Another example of the importance of rank comes from the FC interviews:

> An Associate Department Head in Math - he wasn't too friendly to us. But we never took the time to figure out why he was not too friendly. Not only that, [John] was the freshman team leader, and [he] was in charge of doing a lot of things, including negotiation with math. Well, nothing against [John], who happens to be my friend,
> but [he] was an Instructor without a Ph.D. Well, here you are, an Associate Department Head, and engineering is sending you an Instructor to negotiate with you, how are you going to feel?

This incident was identified by couple of people as being a big mistake in attempts to enroll math into the curricular change project at one of the universities. We can interpret that the associate department head felt insulted by not having his position recognized by engineering sending a negotiator of professorial rank, if not of equal administrative position. Ultimately, the math department at this institution did cooperate with engineering, though without enthusiasm.

Rank means a great deal in academe, and roles and positions often shape beliefs. Rank determines how one should be treated. In this next passage an engineering professor who has recently been promoted talks about how his new role has changed how his colleagues relate to him.

> G. But from where I sit now…I'm an administrator now. And they look at me differently. And everything I say, they don't hear [my name], faculty member, they hear "associate dean." In spite of the fact that most of the time I'm talking as a faculty member. But it's the same stuff I used to say. Except I said it as a faculty member. But now they think "Oh, that's the dean."
>
> I. So it's more dismissive?
>
> G. Yeah.
>
> I. It's a hindrance, a handicap towards influence?
>
> G. In some ways. I was quite disappointed.

Conclusion

Congruent with this implicit notion of quality are "many of the most sacrosanct practices" which "remain unstated, unexamined and unacknowledged unless they are challenged by divergent beliefs" from within or "outside the culture" (Adams, 1992, p. 5). The major barriers to fully implementing the proposed FC changes stemmed directly from the values held by faculty that were embedded in the master narrative of the academy as well as their respective institutional cultures. Though there were minor variations, as all partners in the FC were not alike in terms of type of school, structure or size, etc., it was surprising to me how the same issues surfaced at each institution.

The Foundation Coalition called for a cultural revolution that directly challenged highly ingrained practices espoused in the master narrative of the academy. It fostered collaboration and teamwork across disciplinary and hierarchal boundaries. It promoted and made audible a reform narrative that caused some to question "the most sacrosanct practices" in higher education that usually "remain unstated and unacknowledged unless

they are challenged by divergent beliefs" from within or "outside the culture" (Adams, 1992, p.5).

The clash of these two narratives exposed how powerful beliefs and values prescribed by the master narrative constructed barriers to reform. It became clear that it was not just reforming promotion and tenure practices, nor creating value and respect for the scholarship of teaching that would alter the culture of higher education so it would be more amenable to change. By working for reform and reflecting on their experience, faculty I interviewed became vitally aware of the academic cultural barriers to change. They also were able to see the changes that had been instituted, both in themselves and in their institutions. The experience opened a dialogue and debate about what it means to be a professor and what it means to improve undergraduate education. It is there, at the intersection of the narrative for reform and the master narrative of the academy, where the possibility for ongoing systemic change will emerge.

I turn now to the four cases that comprise the heart of this study. Each is analyzed separately, but in the final chapter I will look across the four cases in order to draw conclusions about the different ways in which each participant navigated the master narrative of the academy and the counter-narrative of reform.

CHAPTER IV

REBEL, HIRED GUN AND TRUE BELIEVER:

DR. LOUIS EVERETT'S STORY

The management structure of the Foundation Coalition provided many opportunities for faculty to assume leadership roles not often found in the academy. The proposal writers designed the project so that faculty teams on each campus constituted the basis of the management structure, with individual faculty acting as team leaders or coordinators. A national FC Management Team guided campus teams and made decisions about budgets and strategies for promoting the major thrusts of the project. During the first few years, this team consisted of a Project Director, the campus coordinators from each participating institution, and the Strategy Directors for each of the FC core thrusts (technology, assessment and evaluation, active and cooperative learning and curricular integration). Initially campus teams were created to develop the new curricula. These teams consisted of faculty from engineering, the engineering sciences, and in some cases from English, depending on the extent of integration targeted.

Early training for campus teams and institution leaders focused on team-building skills and management techniques. Much of the training was modeled after principles from Total Quality Management and the Boeing Corporation's innovative team-training system. Through the first years of the project, being on the campus teams was extremely exciting, and as one of the participants from my study said, it was "the highlight of my professional career." The enthusiasm generated from these meetings was infectious. The ideas they were discussing were new and innovative; they succeeded in building trust and respect within the teams, and learned how to achieve consensus over difficult curricular issues—often across disciplines. They used decision-making and action-

oriented methods quite different from the academic committee method used to achieve traditional curricular work.

The FC faculty member profiled in this chapter held campus team leadership roles in the FC at Texas A&M during the first five years of the project. Dr. Louis Everett, a mechanical engineering professor, was asked to head up the freshman program development team, and later he was briefly the leader for the sophomore curriculum development team. His participation in the FC was a catalyst for major changes in his academic career. Additionally, he transformed his viewpoints about teaching, learning and curricular change.

In addition to being the team leader for the freshman curriculum development team, Louis was one of the principle course developers and teachers in the TAMU sophomore curriculum that preceded and led up to the initial idea of the Foundation Coalition.

When I interviewed Louis he was chairman of the department of mechanical and industrial engineering and professor of mechanical engineering at the University of Texas at El Paso (UTEP). I had two interviews with him at his office at UTEP. I arranged to do this on two consecutive days, planning to devote our time together on the first day to the change study, and the second day interviewing him for my dissertation. While I attempted to keep these two interviews distinct, we found ourselves mixing the personal work history with the FC organization history, the topics of institutional change and personal change intertwining and becoming inseparable from each other. The following is based on text from the transcripts of both interviews.

In the following pages, I present and discuss Louis' story and identify and discuss four themes of change and identity that run throughout his occupational life history. The next section summarizes his academic career.

Overview of Louis's Career in the FC

In 1989, Louis was invited to write one of the textbooks for a new sophomore engineering curriculum (SEC) at A&M. This was an effort supported by a pre-

Foundation Coalition NSF grant, which will be described later in this chapter. The invitation came just after he received tenure, an event he viewed as a turning point in his career that allowed him to work on things he considered significant. His curricular change involvement continued after the FC grant was awarded, when he was asked to take charge of the FC Freshman Curriculum Development Team. Two years after that he continued in a leadership role for the Sophomore Development team, whose task was to revise the very curriculum he helped develop five years earlier.

After five years with the Coalition, Louis's position with the FC changed and he assumed responsibility for "dissemination," and "raising the level of scholarship" coming out of the FC, tasks that left him bored and uninspired. Feeling it was time for a major change, he accepted a position as associate dean of engineering at the American School in Sharjah in the United Arab Emirates. While he was there two important events occurred. First, the dean with whom he was working had a stroke, so Louis assumed that position until a replacement was found. Second, he submitted his package for promotion to full professor. His promotion was unanimously rejected by the departmental promotion committee back at A&M, a rejection which Louis took very personally. To Louis, this rejection meant that his work in Sharjah and his educational reform work had been totally dismissed by his peers. He was overworked, stressed, and now unacknowledged by his institution, and when a replacement was found for the dean at Sharjah, he and his family took a long vacation back to the States to decide what to do next.

There was an opening for a faculty position at his alma mater, the University of Texas at El Paso (UTEP). After learning of his interest in the position, the school courted him with an attractive package which included full professorship. They also had a new innovative freshman program, and he saw in UTEP a place where his work in teaching and curricular improvement would be supported and valued. It was also a location where his research interest in manufacturing could contribute to the community; as a border city, El Paso was losing income and manufacturing jobs to companies moving to Mexico. He accepted the position, and several months after arriving at UTEP,

Louis was asked to become chair of the Mechanical Engineering department, which he accepted reluctantly, knowing this additional responsibility would force him to put his educational work on hold. He was in that position when I interviewed him in 2002.

Four Themes of Change and Identity

At my request, Louis focused on personal change as he told me his career history and tailored his story around several events in his life where change was a dominant feature. In these episodes Louis' personal values are prominent motivators for change. Four themes emerged from his narratives as he talked about personal changes. Two related to self-identity. He is either actively resisting the prevailing social norm and behaving as a "rebel" or accepting and valuing the prevailing norm and being a "believer." These two themes of "rebel" and "believer" are related to a third, revolving around *how change occurs*. For Louis, becoming a believer either occurred by his being "pushed and shoved" and "subdued" into accepting the norm or change occurred as a result of *conversion.* He introduced the conversion theme when he shared his story about becoming a "born-again Christian."   This conversion experience occurred just before he received tenure – a synchronistic event which provided the motivation to take advantage of the freedom afforded by tenure to work in educational reform projects. Conversion is again a theme in two stories related to his curricular reform work; one story when he suddenly sees the power of a foundational teaching concept for the innovative sophomore curriculum that preceded the FC, and a second story about how the freshman development team finally understood how curricular integration could be accomplished.

Lastly, there is a fourth identity-related theme in Louis's narrative. Throughout his involvement in the NSF-sponsored curricular reform projects, as well as in his administrative work in Sharjah, Louis referred to himself as a 'hired hand" or "hired gun." This expression did not reflect ambivalence about his work, but a need to be clear about the role he played in these activities. Several times during our interviews he made sure I understood that he had not been an instigator or PI (Principle Investigator) on any

of the grants. He said, "You can be a hired hand and still believe in what you are doing." Louis's worldview came from the perspective of one of many workers, a guy in the trenches following orders. Despite heading two teams, Louis did not view himself as a leader.

For Louis the counter-narrative of reform embodied in the FC mission called to his need to do work that that he considered significant. Never really conforming to the academic norm, he thought of himself as *in* the academy, but not *of* the academy. As will be shown in what follows, he eschewed the master narrative, and was often in conflict between doing the work he saw as significant, and doing the work that would maintain his place in the academy.

Louis, as a gifted storyteller, used several stories to illustrate important transition points, especially those that facilitated his own transformation or his ability to help others in transforming their thinking. I have chosen four pieces of his occupational life history that particularly evidence these transition points. The following narrative segment deals with his acculturation into academia; the influence of the master narrative is apparent as he gives voice to his advisors and mentors.

Socialization of a Rebel: Becoming the Good Student

The plotline for a typical professorial career begins with socialization into the academic culture. This usually begins in the undergraduate years, the process becoming more intense during graduate school. Besides gaining the requisite disciplinary-specific knowledge and skills, graduate students are inculcated with the norms, values and behaviors of the academy and their particular disciplinary community. This professorial plotline reflects the hierarchy and associated power differentials upheld by the master narrative of the academy. It lays out a route, marked by passages through higher and higher plateaus of achievement, each successful passage granting more privilege, prestige, power and freedom, while at the same time maintaining the status quo, a status quo that reinforces and keeps the master narrative in place.

Louis's academic story follows this plotline. His occupational life history starts with a characterization of himself as a "rebel:"

I guess as a teenager
I was an anti-establishment person
so it seemed like I was a constant devil's advocate,
I'd just want to overthrow everything,
I don't know why I was like that,
but I guess it was just a rebellious nature...

I would say nasty things to people
that were in the establishment.
To my teachers in high school and you know,
when – looking back on it,
they were hurtful things…

But…the reason I did it
was because I didn't like things
that were the same.
I didn't want to be in
the same school that somebody else was.
I didn't want to do
the same thing that everybody [else did]…
It was just – yeah, non-conforming.
And so I guess it started there.
I just had this nature of
        "Oh yeah? Oh yeah?"

Well, see I've always been into change.
I was always kind of a radical guy,
I learned early on in undergraduate education
That if I really wanted to be an anarchist,
What I needed to do
was to become a member of the system
And then change it from the inside.
And I said,
        "Well, you know, that made a lot of sense"
And so I put my anarchy days behind me and started studying…

I went to school here at UTEP.
And I was homegrown,
I was raised in El Paso
and there was somebody

I thought I couldn't live without
and so we came to the local school.

I wasn't that big on education,
I figured…when we break up
I could quit school
and go get a job somewhere.
But, anyway, I didn't.

By the time I began to mature
I was a "believer"
        "If I just stick it out
        and get an engineering degree
        I'll end up with a good job, a good salary."
So I said,
        "OK. Well, I'll just stick it out."
I was doing well so I was enjoying it.
So I guess in a way, you know,
it kind of subdued me.

You know, it was like
        "OK, I'm getting older,
        I'm getting some money in my pocket,
        I'm getting a little bit of pats on the back
        because I'm doing well.
        So maybe I should just quit the non-conforming business
        and I'll just fall into life. (laugh)
        Get my job and be done with it."

The first thing that Louis has accomplished in the beginning of his story is establish two important aspects about of his professional identity: his basic nature is rebellious, and when he talks about change, it is about change that is major. Louis positions his younger self challenging and in opposition to the prevailing social norm. He is motivated by wanting to be different. As an anarchist, issues of power and hierarchy concern him. Educational reform is intentional transformation that requires a "radical," an "anarchist" working from within the "system."

Our interviews in the large study of the Foundation Coalition, as well as my interviews for this study showed that if a student in high school had an interest in, and was good at math and science; teachers and guidance counselors steered that student

towards engineering. Also it was typical to hear that freshman engineering students are told that the program is highly competitive, it requires very hard work from the student, and only the best and brightest survive. So for Louis to succeed, the attitude of not being "big on education" had to change. Whether due to this competitive nature of engineering education or something else, sometime during his first few semesters, Louis's challenging, rebellious nature undergoes a transformation, and as we see in the following segment, he learns to "believe" in the benefits of an engineering education. He has introduced at the very beginning of this story two important identities, the "rebel" and the "believer."

The image of the rebel being "subdued" by achievement, praise and money is an uncomfortable one. There is a feeling of surrender in how he speaks about this transition, a sense of giving up something to "just fall into life," get a job and "be done with" with being the rebel, with questioning the system. While this may seem to be a contradiction to his earlier self-characterization as an undercover anarchist willing to change the system from within, the theme of the rebel self, as we will see later, resurfaces after he receives tenure.

At UTEP the academic life becomes appealing. The professors he saw at UTEP seemed to have "relaxed lives," because teaching, not research, was their primary responsibility and so he reformulates his plan and decides to get his PhD so he could, as he said somewhat sarcastically at his own youthful idealism, "retire to a nice job somewhere (laugh) and teach."

The idealized image of a relaxed life of a professor is altered when he enters graduate school. His experience of acculturation is intense, as we see by the absence of agentive language in the following passage:

I ended up going to Stanford [for my Masters.]
They kind of whipped me into shape
turned me into a little bit more of a "go-getter."

I had to work hard to get through there,
and so they made me dig a little deeper.
That started heading me in the direction of science

and really getting serious about being an engineer
and trying to do something.

One of the major stages of professional socialization is role acquisition, where the personalities, social roles and social structures merge and the role is internalized (Weidman, Twale et al. 2001). A professional identity is being formed as Louis gets more serious and committed to engineering and the engineering sciences. He is becoming more familiar with the disciplinary-specific norms which are part of the master narrative of the academy: ambition, hard work, seriousness, and accomplishment. Also there is another prime motivator for learning to "get serious" about engineering. He is married now and has children; supporting his family becomes a prime motivator for learning to play the academic game.

After a brief stint working in industry, a phone call with a colleague leads to Louis serendipitously obtaining a lecturer position at Texas A&M University. He decides to continue his studies in the PhD program there. At A&M Louis's academic socialization continues under the tutelage of powerful faculty member. He is at a point in his career where the main values of the master narrative and the "rules of the game," are inculcated in almost militaristic fashion,

> I was working for the department head
> and he was a real dominant person.
> He was a real strong leader.
>
> I respected the man,
> I know a lot of people didn't like him
> and so he really whipped me into shape
> as far as being very business-like,
>   "take care of top priority
>   and top priority is make money for the university
>   and put money in your pocket along the way,"
> So he turned me into a researcher.

Louis's self assessment as a researcher was not very good. He didn't feel like either he or his work was part of the mainstream, always feeling "like I was kind of on

the [out]skirts" and a "bit insecure." Louis questioned that maybe he was just not ready for where his mentor was guiding him. Achievement in academic research in engineering meant bringing in grant money through researching an area unexamined by others. The guidance in his training was,

> "In order to be successful…you have to focus.
> You know, pick an area, any area, but pick it,"
and I didn't like that.
I wanted something
that was kind of diverse and spread out.

I guess because of my background.
I had three degrees,
in three different areas almost.
But I think he was kind of
bending me and pushing me
because of the finances and what not,
and because of the type of person he was,
into that [research] area.

And so I went that way.

after I graduated,
I started teaching
and the teaching was OK,
but he had built into me
that you hustle and you do research.

So I did that for a while and coasted.
He left the university,
and I did my thing.
But it was never really
I was never into it completely, you know?
I guess I was always looking
for something a little bit different.

During this early period of his career Louis plays the academic game and develops his research agenda. But his rebellious nature is not totally suppressed. While he is being a good professor, he has not totally accepted the master narrative.

In this section I have begun to flesh out some attributes of the master narrative and how it is communicated to young initiates through the process of socialization into the academy. This dominant narrative is communicated, maintained and reinforced through everyday talk, official documents of an institution, and classroom discourse. It is also represented in rituals and academic rites of passage which are a mainstay of the socialization of graduate students. It is also reinforced through advisor/advisee relationships. Louis positions himself in the academic game, but on the sidelines and not necessarily committed to winning. Despite all the "bending and pushing" he keeps a "look out" for something different. As we see in the next section, the attainment of tenure releases the hold the dominant narrative has on Louis. He feels a feeling of security and freedom to pursue his own interests.

The Conversion to "True Believer"

Although he worked as a "hired gun" in a small grant developing distance learning projects in mechanical engineering, Louis's commitment and willingness to get involved in educational reform was essentially "on hold" until he received tenure. He knew if he engaged in educational reform work rather than focus entirely on research, it would be the "kiss of death" to his academic career. Just before going up for tenure, he experienced a profound personal change which rekindled his desire to do something "significant,"

> About the year or so
> before my tenure time,
> I became a born again Christian.
>
> And then all of a sudden…
> talk about a paradigm shift, you know?
> Suddenly it was –
> things were shifted
> off of me and mine
> and for me
> and all that kind of thing,
> and suddenly it was like,
>   "What are you doing for other people?"

"What are you doing to leave a legacy?"

That's when the first project came along.
Right after I got tenured.
They pulled me into the conservation effort
and [I] started doing that sort of thing.

The "conservation effort" was part of an earlier NSF-funded curricular reform project. Several FC partner institutions entered into the Coalition having already successfully completed innovative work in their freshman and sophomore programs. One of the key strengths of the Foundation Coalition proposal to NSF was using these programs as guides and models for further work. One of these early innovative programs was the Sophomore year Engineering Science Core curriculum at Texas A&M (SEC). Development of this set of five courses began in 1988 supported by an NSF grant. The courses were implemented in 1989, even while the materials were still being written. The establishment of these core courses was quite revolutionary. They were designed and taught in an integrated manner, that is, across engineering disciplinary boundaries, so no course was attached to any specific department. They all were based on a basic philosophy for teaching engineering, which is that more effective learning occurs when the students approach engineering problems with a deep understanding of a few fundamental scientific conservation and accounting principles. Referred to as the "conservation and accounting framework," the courses broke down the boundaries between the engineering disciplines and introduced more design opportunities. Each of these elements challenged time-honored norms in the traditional sophomore curriculum.

In Louis's eyes, working in educational reform was linked to his experience of being "born-again." The project provided the opportunity to work on something that had the potential of contributing to other people and leaving a legacy. Given the counter-narrative and its characterization of engineering education reform as spawning a cultural revolution, the notion of "leaving a legacy" through participating, even only as a "hired hand" or "hired gun," makes sense for Louis. He had used the expression in our first interview the previous day when he spoke about his first curricular reform experience working on the Plato Project. He used it again when he referred to his being "pulled in"

for the sophomore curriculum project, also when he became freshman curriculum team leader, and yet again when he was talking about his assistant dean position at the American School in Sharja. I questioned Louis about his use of the expression. He responded by saying,

> Well you know you can believe in what you're doing
> and be a hired gun, right?
> Which is what I was.
>
> I mean I believe in change
> and all that sort of thing.
> So I think I was passionate about it.
> But I was not the ringleader…in that sense,
> I was somebody who
> would have looked forward to doing that,
> but I was somebody they approached and said,
> > "We want you to do this."
> On both projects I was not a P.I. or a co-P.I.
> I was just somebody that they said,
> > "Hey here's this crazy guy over there."

Rather than signifying an absence of personal agency or lack of owning his work in these projects, his consistent use of the expression may simply be genuine self-effacement. Even for a "hired gun" the level of commitment can become deeper. We see a deeper transformation in the following story, several versions of which were told to me by other leaders in the FC before I met Louis. It had become part of the Foundation Coalition's organizational lore, and I suspect it served to add credibility and validity to this new revolutionary method of teaching basic engineering concepts. It also makes a good story.

The event to which this story refers occurred before the FC was funded, during the time the SEC program was being offered to students and while the SEC faculty were still writing the textbooks. I first present the story in its entirety. I have rendered the story in the manner explained in Chapter II - breaking it up into stanzas and subtitling its separate parts. Embedded dialogue is indented and placed in quotation marks.

Stanza 1: Setting the scene

 I have told a number of people this, that
 I never really became a believer in what I was doing, you know?
 I did it.
 I was a hired gun.
 I was there –
 I was to write a book.
 I was doing this.
 I was supposed to deliver these materials, and
 I was supposed to speak "the speak."
 And I did that to the best of my ability
 but I never really became a believer of the power of the concept
 until I was faced with a with a situation where I was out of my area.

Stanza 2: Not my area of expertise

 I happened to be doing this systems course, and
 I happened to be in an area of fluid mechanics,
 which is not my specialty,
 is not my training.
 You know, I had it in undergraduate school
 and that was about it.

Stanza 3: A simple problem

 And I was doing a problem
 where it was a real simple problem.
 We had water coming out of a tank,
 no big deal.
 And, of course, you know,
 you go - to do – this process,
 you talk about what's important,
 what's not important.
 This sort of thing
 and I said,
   "Well you know we have a fat tank.
   It's kind of short and so
   the water's coming out fast through the spout
   but it's not moving very quickly in the tank.
   And so therefore
   we can throw this away,
   and this away,
   and this away,
   and this away.
   And so we get this nice little pat answer
   that you know I'm looking for, right?"

Stanza 4: The challenge
    And some smart aleck in the classroom says,
        "Well what if those are not true?
        What if it's a tall tank,
        it's thin,
        it's this,
        it's that.
        Blablabla?
        So all those assumptions are gone.
        What if that happens?"

Stanza 5: The escape
    Well (sigh) I looked at my watch and
    thank God it was time to quit.
    And I said,
        "Well that's obviously the water hammer problem.
        Uh I don't have time to go into that now
        but we'll talk about it next period.
        See you later." (laugh)

Stanza 6: The quest for an answer in the textbook
    So I went back to my office and I said,
        "OK now I'm going to have to figure this one out."
        So what did I do?
    I pulled off my fluid mechanics book and I looked –
    I mean I knew it was –
    What was going to happen was a water hammer.
    So I knew what to look for
    and I started looking through the index,
    couldn't find it,
    couldn't find it anywhere.
    I think I may have found finally an undergraduate book
    that talked about it.
    And didn't talk about it very much
    and it wasn't satisfactory and
    I knew I was in deep trouble.

Stanza 7: The quest for an answer using old fashioned techniques
    So what I did was I said,
        "Well, I think I can derive these uh equations
        and solve them
        and prove to myself
        and everyone else what happened."

Well I resorted to the old fashioned techniques.
They didn't work.
I didn't know what to do.
I was in a panic.

Stanza 8: The quest for an answer, ask colleagues for Help
So I talked to several of my colleagues that, you know,
I didn't mind confessing my ignorance to.
They weren't much help.
I mean I'm sure they could do it
but they weren't much help explaining it to me so (laugh)

Stanza 9: The quandary
Essentially what happened was
I was in a panic,
it was about uh twenty or thirty minutes before the class.
I still had not had an answer,
and I said
    "Oh no, what am I going to do?"

Stanza 10: Walk the talk
So what I did was I said,
    "Well heck with this."
I was going to use the technique that I've been preaching for –
I don't know if it'd been a year or whatever –
but anyhow
    "I'm going to use the technique I've been preaching here
    and I'm going to sit down and carefully do this."

Stanza 11: Success
So I sat down and carefully did it and sure enough,
you know I didn't quite have enough time to get it all the way through,
but at least I got it to the point where I said,
    "Ahah! I see.
    This thing's going to work.
    No problem.
    I'm getting exactly the equations I expected to be getting.
    And I'd be able to wave my hands from here on out.
    OK."
So it was, it was great

Stanza 12: Resolution
I went into class.
I was able to present it.

The students caught onto it fairly quickly.
I think they understood it.
I made the point of what water hammer was,
and why it was, you know,
what caused it, et cetera,
and they seemed to be satisfied.

Stanza 13: Becomes a believer
I went on and I became a believer from that point on
and yeah and
so then it was in my blood.

This story helps us understand what Louis means when he calls himself a "hired gun" turned "believer." The story illustrates the power of the accounting and conservation principles as learning aids, but also makes the point that these principles can be tools to help a professor save "face" in front of students. Impression management, after all, is a major concern for faculty, or any group of persons where performing before a group is a requisite of their occupation (Goffman 1959). The question we are left with, however, is one of motivation. Is Louis convinced because he sees how the conservation and accounting principles saved him from a potentially embarrassing situation? Or is he converted because he sees the principles' power as a problem-solving tool that is applicable across all engineering disciplines?

In Stanza 1, Louis provides a synopsis and the point of the story, his conversion from a "hired gun" to a "true believer" is a result of the "power of the concept." This event is important and meaningful to him, sufficiently so that it bears repeating to "a number of people." He elaborates on his meaning of "hired gun" as well, and does so in a manner that suggests his commitment is similar to that of a good employee, a hired hand: he has been following instructions, doing what he is "supposed to" do. But an additional responsibility is "to speak 'the speak,'" inferring that Louis' job also includes promoting or "selling" the concept to others. This is indeed what he means, for in the context of our interview so far, we have been talking about curricular change and issues of faculty "buy-in" and resistance to new ideas. The FC mission also included disseminating these innovations to other schools. But advocating an innovation when

you are not already "sold" on the value of the concept yourself can be difficult, so you do it "to the best of [your] ability." The stanza begins (2nd line) and ends (next to last line) with "I never really became a believer," using the poetic device of repetition which makes the point of the story stronger.

In the *Stanza 2* Louis describes the setting, and we learn the "situation" takes place in a classroom where he is teaching in an area outside his specialty. This type of situation for a professor presents concern because of the possibility of appearing not to know the answer in front of students. But its usefulness as an organizational story has to do with the curricular concept that was the foundation of the course he was teaching. He illustrates how powerful that concept is, as it "saves" him when he is confronted with a problem that was not in his area of expertise.

Stanza 2 provides the listener more details of the situation; the place is a systems course, the time in the course where the topic of fluid mechanics is covered. By reiterating how little he knows about the area of fluid mechanics, Louis is emphasizing the precariousness of the situation he is about to find himself in.

In *Stanzas 3* through *9* Louis tells the actual story. Throughout he uses several storytelling techniques, like humor, repetition and embedded dialogue. He first creates dramatic tension by characterizing the problem as something "simple" to understand and demonstrate ("no big deal"). Then he presents and explains the problem in a formulaic manner which leads to "a nice pat little answer." This characterization is an example of a *simple external evaluation*, an embedded comment that alerts a listener to the "exceptional nature of the events" (Gwyn, 2000, p. 316). This was a real simple problem and should not have provoked what was about to happen. It appears that Louis is describing the pedagogical techniques that the innovative curriculum was designed to replace -- traditional lecture techniques presenting "pat" formulas based on tacit assumptions about the problem.

In *Stanza 3* we see the first use of embedded dialogue, which Louis uses frequently in his tale. In this stanza he uses embedded dialogue to describe the problem and solution. But this is not an actual quote, and as an accomplished storyteller, he

knows that it is not necessary, and may even be detrimental to holding the listener's interest, to quote what he said in its entirety. He is tailoring the story to the context of this telling – I am not an engineer and would not understand the technical nature of the problem. Instead he uses repetition of "throw this away, and this away…" to take the place of the actual formula, and at the same time makes the point that it all should lead to a "nice little pat answer." The cadence is repeated again in *Stanza 4* as he assumes the voice of the "smart aleck" student who challenges Louis with an alternative scenario. The end of *Stanza 3* and all of *Stanza 4* parallel each other in structure: the expected outcome of solving the problem ("you know what I'm looking for, right?"), and the different outcome of an alternative scenario ("what if that happens?").

Up until this point in the story and through *Stanza 5*, Louis has maintained his knowledgeable professorial image in front of the students. Fortunately for him, the class time has run out and he manages to make his escape promising an answer for the next class period.

In this next few stanzas until *Stanza 10*, Louis narrates his attempt to solve his quandary using three different strategies: he consults a textbook used in the undergraduate curriculum, he attempts to solve the problem "using the old-fashioned techniques," presumably these techniques were the ones he himself used as an undergraduate, and lastly he asks for help from several colleagues -- those he "didn't mind confessing my ignorance to," which is another obvious instance of impression management.

In the final four stanzas of the story, we see evidence of the proselytizing and zealous nature of FC reform movement. We find out that Louis has not only been teaching this method, he has been "preaching for" it for maybe a year already, but as a "hired hand" he was "supposed" to be doing. But this classroom incident provides the opportunity for conversion; at last he sees its value and becomes "a believer…so then it was in [his] blood."

Below, Louis' movement from his position as a "hired hand" to "a believer" is illustrated in Figure 2. At the beginning of the story he positions himself at the border of

the master and counter-narrative. After his unsuccessful foray into the traditional methods in an attempt to answer the student's question – illustrated by the arrows into the light green area of the master narrative, his successful use of the foundational principle he is teaching firmly positions him within the counter-narrative (represented by the dark green field.
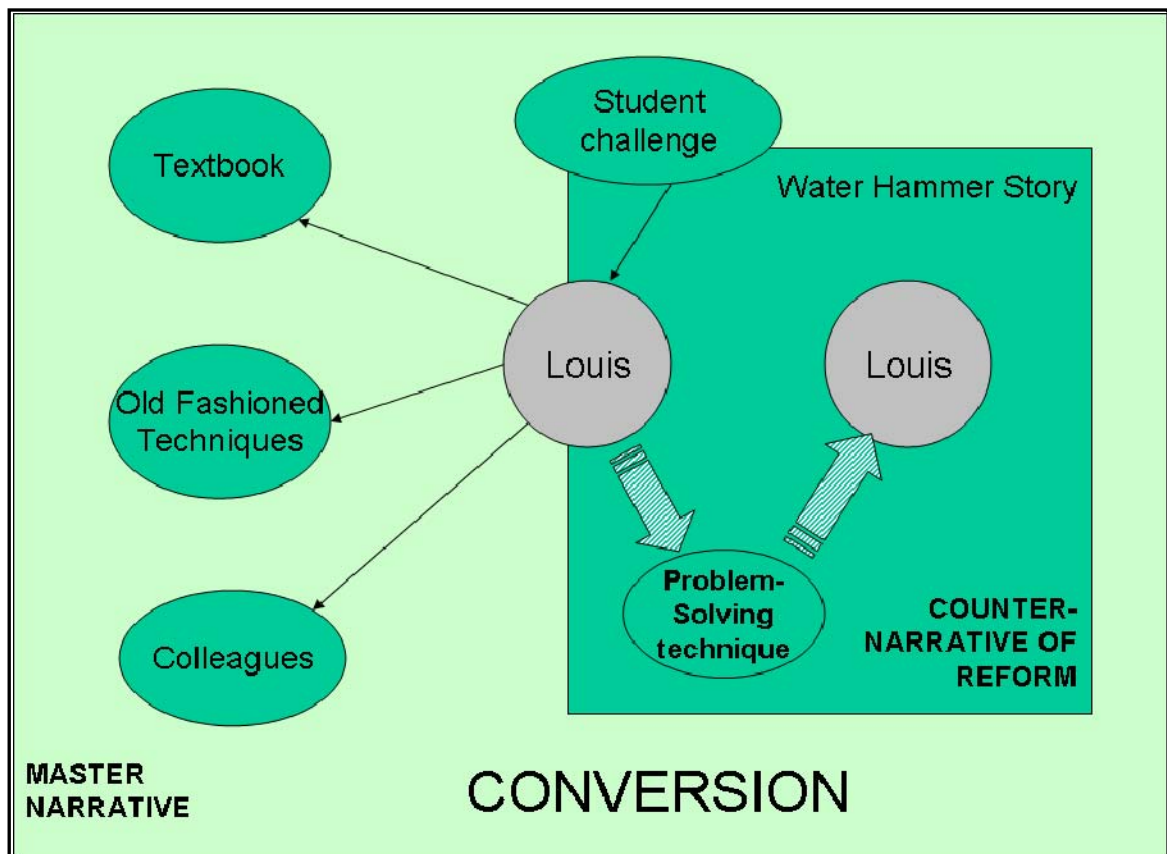

Figure 2: Conversion from Hired Hand to True Believer

This story reveals quite a lot about how Louis related to his participation in the reform projects and how that changed over time. But the fact that this particular story is

repeatable -- I heard the story from several engineering professors before I heard it from Louis -- tells us something about the context of engineering education as well.

Mass Conversion

As the Foundation Coalition started gearing up after receiving the funding for the first five years, Louis was again "hired" to be the Freshman curriculum coordinator; a position whose purpose was to lead a large number of faculty from engineering, the engineering sciences and mathematics in developing a completely new curriculum. These early stages of curricular development were described to us in the interviews for the change study in almost glorified terms with stories having an aura of heroic journeys. At this stage, the goal of the leaders in the development teams—often referred to in the change study as "the champions"—was to introduce and persuade team members of the curricular vision of the FC; a vision seen as a radical departure from the traditional lecture delivery of disconnected engineering science concepts.

A major aspect of academic culture and the master narrative that keeps it in place is "disciplinarity," the maintenance of distinct divisions between the disciplines. This disciplinary separation creates barriers to interdisciplinary work. Disciplinarity is an important construct to keep in mind when altering curriculum. Traditional curricula are deeply rooted in the disciplines. Integration of any type will certainly deal with barriers that have deep roots in tradition. Discussions about improving teaching usually start with the premise that "faculty teach the way they were taught" but it also relates to what faculty know curricula to look like. The following story illustrates how difficult it was for the freshman development team members to conceptualize what disciplinary integration might look like in practice.

Louis begins the story describing a meeting with the team where they are discussing how to design the integration. He said, "I was trying to get across this vision of how we could…bring things together…just when we needed it…and all [faculty would] cooperate and collaborate on this sort of thing." The group just was not getting the idea and arguing with Louis that it couldn't be done. Louis suggests they all go to

Rose-Hulman Institute, so they could observe their integrated freshman program in action:

[so they said]
        "Well, OK we'll go.
        But you know this is futile.
        This is useless."

So we ended up at Rose-Hulman
and I was kind of down in the dumps.
I was thinking, you know,
        "What am I going to do with these people?"
And I think we were there about an hour and a half,
and [two members of the team] walked up to me
and they whispered.
They said,
        "You know, we think we can do this.
        And not only can we do this.
        We can do it a lot better than they're doing it."

It was before lunch
that… all of a sudden,
I mean this was a huge shift.
Everybody had suddenly just turned 180 degrees
They saw the fact that you could, in fact, integrate –
You know, they saw it happening.

So I think that was part of it,
the fact that they come from departmental –
compartmentalized chunks.
That it was difficult for them to recognize
that yes, in fact,
you could teach chemistry,
or physics,
or math,
or whatever it was
by introducing an engineering problem.
You know it could, in fact, be done.

And so I can understand it.
I mean if you haven't been there
or seen it done,

or had the vision or something…
Now, I don't know how I had it….
I hadn't been to Rose-Hulman but somehow…
it was like
    "Why not?"
    Let's give it a whack."

It was… it was amazing,
and it was just such a great experience…
to be there.
They saw the vision.
They knew where they were headed.

Unintentionally, and without a plan, Louis orchestrated a major opportunity for change in belief systems for his colleagues on the development team. Before they went to Rose, they had engaged in a rigorous discussion about the nature of integration and how it might be accomplished. They shared a familiar ingrained view about engineering education that made it difficult for them to imagine anything different. The opportunity to observe disciplinary integration in action challenged this traditional vision and forced the team members to reflect on old assumptions about how engineering principles could be taught. We understand the importance of the moment through Louis's use of conversion language: they "saw the vision," It was an "amazing" and "great experience to be there" to witness the change. It happened suddenly and quickly–a type of change that is a complete reversal, "180 degrees."

Louis' efforts, as a "hired hand" in the FC were concentrated locally at A&M. As a curriculum developer his used his diverse engineering training to rethink and re-organize the order and focus of how foundational principles for the beginning engineering student were introduced. Until his own conversion experience in the classroom, Louis wasn't personally a strong advocate for the ideas. But faced with the nightmarish experience of appearing not to know the answer in the classroom, his frantic and unsuccessful search for an answer forced him to use those principles, and successfully solve the problem. He became a believer.

Sustaining the Change

Louis's conversion is an example of what the FC wanted to achieve with faculty who entered the project once the curricula were implemented. It was essential that these faculty not only "buy-into" the principles in order to successfully deliver the courses, but become believers so the program could be sustained over time. It was a tacit assumption that this would occur with faculty, that the courses themselves would turn faculty into believers, that the change would be sustained.

A more direct strategy used by FC was to encourage faculty to work in the effort by offering course buy-outs during the academic year and salary support during the summer. Louis questioned the efficacy of the practice. Ultimately, he believed that his own experience of conversion from "hired hand" to "true believer" was the only way change could be sustained:

> Can you cause people to change
> by buying them?
> Yeah, but you're not going to make them
> change their attitudes or feelings.
>
> Maybe what you need to do
> is you need to buy enough of them
> so that they stay out of the way.
> So that you can do
> what you want to do.
>
> But…somehow I think
> you got to change the power system, right?
> I mean it – eventually, you know,
> you're going to quit rewarding them,
> and they're going to fall back
> into their belief system.
> And when they do
> and if they're in power,
> you know you got problems.
> I mean they'll kill it right?
>
> So you know rewarding people
> and that sort of thing?
> Well you can just encourage people

that are on the border to say
      "OK, yeah maybe I'll do that."

But is that really what you need?
I mean I think what you need
to make change happen,
don't you need people
that really want it to happen?
…that they're going to do this
no matter what you do,
and when you throw an obstacle up
that's OK.
We're going to go around this one
or go over it
or whatever the case may be.
I mean that's what change is all about, right?

Otherwise you're just going to have
some lackluster people
that kind of say they believe it…
You're just going to be pulling in people
that kind of go along.
Kind of like what I was doing
with the research agenda…

I was going along with it
because I knew I had to.
This is what they valued,
and if I wanted to get a position in their society,
I had to do what they asked me to do.
And so that's what I did.

Near the end of his first year in Saudi Arabia when he was acting dean, Louis decided to throw in his packet for promotion to full professor. He was well aware that his work did not reflect the research publications and grant money it might have had he not chosen to work in the curricular reform projects. Knowing that he wasn't ready, but with a sense of bravado, he put it in anyway. The promotion packet never made it past the seven-member department committee. It was unanimously rejected, with nothing but negative comments.

I threw in my packet,
and I knew I wasn't ready when I threw it in.
I said,
      "I know I'm not ready.
      I needed some more publications.
      I needed to really kind of get that research program cranked back up."
And what I expected them to say…
      "Well you know,
      if you get serious you can make it."
That's what I kind of expected.

And I expected it to be negative.
I tossed it in there in the spring of 2000
and basically it came back
and it was just absolutely,
overwhelmingly negative.
And I don't remember reading
a single positive word about it.
And I thought,
      "OK. That's it."
      Enough."

I knew what they didn't like.
But surely of the seven people,
someone would at least say,
      "you know he's done an admirable job
      but he's not the kind of guy we want."
or something.
But I mean it was just absolutely, 100% negative.
I might as well have not existed...
And I thought
      "Well thank you very much."
So I was real disappointed.

Louis felt confused and hurt when his contributions, though valuable, were not valued enough to warrant some acknowledgement.

So I was looking through the magazine, you know,
and happen to see an ad for a position here
and I thought
"well let me think now.
my research program, it's applied research
and it's in manufacturing.

Well the local economy is manufacturing.

And then I said,
"the other thing is I've been doing all this educational reform
and all these kind things.
The typical student that comes to UTEP I'm really proud of.
They're people that typically have a family,
they've got kids that they're raising.
they commute to campus.
they have a job they work
at least twenty to thirty hours a week,
off campus, doing tough jobs.
I mean and they stick it out."
And I said,
"You know that's fantastic."

Plus they typically come to UTEP
with lower math skills
and study skills
and that sort of thing.
High schools probably
are not as good as they could be.
I don't mean to dump anything on them.
But I thought,
"That's the perfect environment
for the research that I'm doing.
It's the perfect environment
to test out and see
if I really am a teacher…"

I mean people go to A &M, well shoot.
You can't hurt those kids if you tried…
I mean to some extent.
Kids here, they're desperate.
I mean if you fail them, that's it.
You know this may be the end of it, you know?
and they're doomed to a cycle
of low education,
low pay."
And so I said
"Man, that's perfect.
That's ideal.
And they've got a job opening."

After years of conforming and playing the academic game to achieve tenure, Louis as at last had an opportunity in the FC curricular reform effort to change the academy from within. He learned however, that merely operating as a "hired gun" in a project was much less rewarding than believing deeply in the principles and goals of the work. Louis struggled to find a balance between his professorial duties as defined in the master narrative, and his personal values which resonated so well with the counter-narrative of reform. In the process he experienced many personal changes in his worldview: from rebel to hired hand to true believer, from feeling betrayed by A&M to redemption at UTEP. Always his sight is on realizing the ideal, the ideal academic position, the ideal working environment, the ideal program and way of teaching. Feeling betrayed by A&M and the manner in which they handled his package for promotion to full, Louis left A&M for his alma mater, and another opportunity to realize his ideal.

CHAPTER V

SEEKING ANSWERS TO THE HARDER QUESTIONS:

JIM RICHARDSON'S STORY

Introduction

The events from the past that we use to compose a life history are always told from a particular point of view in the present (Jarvinen, 2004). That point of view is both informed by those events and helps shape the telling of those events. Just as participants in this study chose how to tell and what to include in their stories, I, as the researcher listening to these stories, attended to the experience and made certain aspects of that experience meaningful (Riessman, 1993). Thus the dialogs produced narratives that were created jointly by myself and the participant. In this chapter, which focuses on Jim Richardson's story, the co-constructed nature of the narrative is particularly evident.

Jim Richardson had many opportunities to think about and discuss the issues of change—both curricular and personal—related to the Foundation Coalition. He was a colleague on the change study team. Because of that sustained collaboration, my three interviews with Jim transformed from an interviewer-respondent model to a friendly conversation between colleagues. Therefore, as Jarvinen explains, we came to share much in common:

> Most narration takes place not between fleetingly joined strangers, but as part of a relation that is continued over time, and in which a given exchange builds on previous exchanges and projects future exchanges. Such histories of interaction require an understanding of the present relations, projected relation, and the present context of narration. Thus, one crucial function of most acts of narration is the negotiation of the relation of the interlocutors, and their possible co-membership in communities indicated by the narrative. (Jarvinen, 2004, p. 47)

We talked often during our work on the study, while traveling, over meals, and in formal meetings with the research team. Our conversations were more frequent and prolonged during the data gathering phase of the project. Over a four-year period we created an interactional history, upon which our relationship grew. We talked about what

we saw as the greatest barrier to change – attitudes and behaviors of faculty and students that we attributed to the culture of higher education. Because of these many opportunities for Jim to talk about teaching in general, and his experience with the FC in particular, his narratives are very self-reflective. He used these conversations to explore the issues that were important to him. I did this as well. By the end of the third interview, I was at the stage in my research where I was exploring the concept of the master narrative as a basis for my findings. I used my conversations with Jim to further refine and apply the concept to my analysis. I was seeing how powerfully the master narrative effected personal and organizational change.

Compared to the other participants in my research, Jim was an anomaly. Our work together could be viewed as ethnographic. We both inhabited a place over a sustained period of time whose culture was subject to inquiry. We co-created the past of the Foundation Coalition and the present of the change study research project. My work with Jim could also be viewed from a participant observer standpoint. As I participated in the construction and interpretation of the FC's history, I also was observing my colleagues' participation, and in Jim's case, allowing my observation of him to inform my dissertation research. By the completion of my interviews with Jim we had a professional and personal relationship. We had a deeper knowledge and understanding of each other's views of the academy, of how to write collaboratively, and of each other's personal mission and goals as academics. We had also become friends, had visited each other's homes and met each other's loved ones. This relationship is an important part of the context from which I report, and also an aspect of the context of Jim's story. It also may be apparent in this chapter, that because of the frequency of our conversations over a period of four years, Jim's perspective, or the endpoint of his story, is much more detailed and complex than that of the other participants in this dissertation.

The core narrative of Jim's occupational life history provides a framework for the stories presented in this chapter and is therefore presented first.   The next sections will address three phases of Jim's occupational story. The first section consists of stories and anecdotes from the years he spent as an undergraduate at the University of California at Davis as he explored various majors and learned about the culture of the research university and its impact on students. These experiences as a student had a great impact

on Jim, and he refers to those times often as he talks about his beliefs as a teacher in the second section, which focuses on the choice to teach and work in the academy. The last section focuses on his growth and learning from his experience in the Foundation Coalition. I conclude with a summary of the evaluative framework Jim uses to assess these experiences and his present commitment to improving engineering education.

Occupational Life History: The Core Narrative

Jim's participation in the Foundation Coalition began after he received tenure, which occurred during the second year of the FC grant at the University of Alabama. He began with the FC by co-teaching a course for the freshman program (called TIDE for Teaming, Integration, and Design in Engineering) and working on the sophomore curriculum development team. The following year he assumed the duties of Freshman Coordinator, and later in the grant period became the campus coordinator (PIC), which afforded him a position on the FC's national management team. His experiences as a leader in the FC initiative at the University of Alabama, his work on the change study and his participation in my study all contributed to making him facile in recognizing aspects of the academy that contributed to the difficulties faced by faculty when attempting to improve the quality of engineering education.

When Jim was asked if he would like to participate on the research team for the change study, he initially accepted because he thought our research focus would be on the change FC faculty experienced, especially as teachers. The more global question about the curricular change process was too ambiguous and impersonal to be very compelling for him. During our work on the change study he shared with us that he believed the most important change the FC caused was the personal change experienced by faculty as they worked in the development and teaching teams and individually on related projects. Even so, he aligned himself to our purpose and discovered that interviewing participants for the change study was very energizing for it provided that opportunity for exchange he so relished while he was working in the freshman TIDE program on his campus.

The following core narrative of Jim's occupational life history is taken from the beginning of my first interview with him. Jim began his occupational history at the period

of time when he was an undergraduate at the University of California at Davis. The narrative is presented using Labov's (1967) structural distinctions of everyday narratives.

Abstract
1   I think I need to talk a little bit
2   about my experience in college,
3   cause that affects ... my ... viewpoints
4   and goals now that I'm a professor.

Orientation
6   I went away to a good school,
8   called The University of California at Davis.

Complicating Action
        Undergraduate years
10   And, uh, was frustrated there though.
11   Uh, I had a hard time developing relationships
12   with many of the professors or instructors
13   because they were so busy,
14   I guess, was part of it.

20   And I changed majors.
21   I started out as pre-med,
22   went to physical science,
23   finally had a friend,
24   who was kind of a goofball,
25   but he was majoring in civil engineering,

47   I decided to major in engineering because
49   I could get a job that paid pretty good,
50   and I picked civil because of my experiences with him.

63   and worked for awhile
64   and then decided to get my master's degree
65   and then stayed on and got a Ph.D. degree

        Choosing teaching
66   and I think always in the back of my head
67   I was thinking about being a teacher,
68   because my dad taught psychology.
69   And he used to come home from work in a good mood.

85   And came here to Alabama.
94   and they gave me an offer
95   and I was glad to have it.

96   I really liked the people here.

109   And I worked pretty hard
110   and did the things I needed to do
111   to get tenure.

Working in the Foundation Coalition
117   The University of Alabama was included in the Foundation Coalition.
119   I wasn't invited to participate right away,
120   because I didn't have tenure yet
127   So I got tenure and I participated
128   and became involved with the freshman year.

129   I really think a pivotal experience
130   was every summer they would have,
131   the summer Foundation Coalition conference,
153   but it was eye-opening to me
154   to find that there were people at other schools
155   that were interested in teaching
156   and kind of thought about some of these big issues,
157   and it was real invigorating, too.

184   And then at Alabama
185   I kind of gradually became more involved.
186   I just started out helping in the freshman year,
187   the first year it was taught
188   and then taught one of the courses,

197   And then the next year
198   I became the freshman year leader,
199   and would organize the meetings
200   and do some of the scheduling and so forth.

204   Then I became the PIC,
205   basically the campus coordinator.
206   And that then involved even more and more campus duties.
207   And also involved traveling now to management team meetings
226   and then finally got off the management team,
228   I was getting frustrated,
229   I really wanted to be more hands-on,

Resolution
233   I really have kind of made an effort
234   to do more technical research.
236   And the reason is,
237   while I was doing all this Foundation Coalition stuff,

238   I stopped doing technical research,
239   stopped publishing,
240   which did not help me
241   as far as making promotion to full professor.

242   I knew that, and that's okay.
243   But also I stopped working with graduate students.
263   And, uh, so I've done more of that
264   and now I'm striving for some balance
265   between teaching activities and technical –

Coda
275   So that kind of brings me up to right now.
276   Doing a little more technical research,
277   but still I'm doing a couple of campus activities where --
278   like we're trying to recommend a freshman year program
279   and that's taken a fair amount of time,
280   and then I have a couple of Foundation Coalition projects.

The *abstract* (lines 1-4) in the core narrative is a brief statement at the beginning of a story that usually summarizes the narrative or draws attention to the "point" of the account (Labov & Waletsky, 1967). In these four short clauses, Jim encapsulates his entire career in higher education by using his experience as an undergraduate as an evaluative framework, as the primary lens through which he views subsequent experiences in the academy. In the first part of the initial interview Jim attributes his present thinking about his profession to his experiences as a student. Later in this interview and subsequent conversations he provides several examples of this causality. This abstract is an example of a "meta-statement", that is, a statement "that inform[s] the interviewer about what categories the individual is using to monitor [his/or] her thoughts, and allow observation of how the person socializes feelings or thoughts according to certain norms" (Anderson & Jack, 1991, p.22). Meta-statements can be evidence for a person's theory of why one believes what they believe and why one behaves the way they do. Through these personal theories, seemingly disparate events of the past form coherence, allowing the narrator to form a consistent interpretation of past, present and possible future experiences (Linde, 1993).

In lines 6 and 8 Jim not only orients the story in a place and a time, he begins characterizing elements in his personal framework. Jim introduces the distinction "good

school," a reference to an academic ranking system he assumes is common knowledge held between us. In the body of the core narrative (complicating actions) Jim delineates the three phases of his occupational story and includes brief evaluative statements that begin to describe the meaning he placed on each part of his life. As an undergraduate he was frustrated because he couldn't establish relationships with faculty, they "were so busy." He chooses teaching because his father, a psychology professor at a small liberal arts college, came "home from work in a good mood," hinting here that there is a distinction between his father's work environment and that of the professors he had at UC-Davis. It is significant that teaching is the one aspect of the meta-profession of the academic with which Jim identifies—being a professor is being a teacher. His identification with, and the important he places on teaching is emphasized again in lines 153-155 when he shares how "eye-opening" it was to discover in the FC that there were other professors also "interested in teaching," and willing to "think about the big issues" regarding engineering education. In the *resolution* and *coda* Jim brings us back to the present and describes his current efforts to find a balance between the research and teaching functions of his position, having let his technical work and advising graduate students slide while he was working as a leader in the FC effort.

In the rest of that interview, as well as in the second and third interviews, Jim refers to his Davis experience often. He always had a story or an anecdote to illustrate a point he wanted to make. In the next section I use four stories that show in more detail what aspects of Jim's evaluative framework are informed by his experience as an undergraduate at Davis.

Learning What Not to Do

In talking about his years as an undergraduate, Jim described himself as disillusioned and drifting. In the first couple of years he changed majors several times. He started out in an innovative program for freshman administered by the sociology department. The fifty students in the program lived in the same dorm and throughout the semester the sociology professor and teaching assistant would hold weekly meetings with students in the dorm. Though not labeled as such at the time, Jim commented that today it would have been considered a learning community. Though Davis was considered a

conservative school, this program had a liberal air about it, being 1972 and at the "tail-end of the hippies." He stayed with that program only a short while, and eventually ends up in the pre-med program.

> I was disillusioned with school.
> I really had a lot of open-ended questions and just, uh,
> Davis was just not a good place for me.
> I couldn't really get any personal attention and
> I kind of drifted over into counseling.
>
> I was a member of the house,
> there was this old house on campus
> that they converted into the Peer Counseling Center,
> and I was part of that.
> And there were some interesting people connected with that.
>
> I was taking all kinds of courses,
> anthropology, sociology, psychology, uh,
> just kind of a range,
> and was kind of looking,
> and I met a guy –
> the house next door was some kind of agrarian effort.
>
> And there was a guy there,
> probably walked around barefoot no matter what time of year,
> and I forget,
> somehow I just bumped into him and he said
>   "Hey, you don't need all this school stuff.
>   You know, you're not learning anything here."
> I said
>   "Yeah, this is a joke, you know,
>   this is not about learning,
>   it's about being a pre-med
>   and getting the next job or something,
>   but it's not about learning."
> So he said
>   "Let's go hitchhike."
> I said
>   "Yeah, why not."

Jim dropped out of school and began an eventful three-month trek across the U.S. with his friend. The story of his hitchhiking mirrored the language Jim used to describe his personal state as a student. He literally "drifted," following his friend and "naively"

trusting him to make the right decisions. They were turned back at the Canadian border and Jim breaks away from his friend who wanted to sneak over the border, and he continues towards the East Coast on his own. He takes several breaks in his journey to stay with relatives, has a harrowing encounter with a motorcycle gang, and finally hooks up with another friend in Washington, DC, to drive back to California. Not yet ready to go back to school, Jim gets a job at a Greyhound station. The following spring semester Jim re-enrolls at Davis, thinking he is ready to "focus and get serious" and chooses to re-enter their pre-med program.

In the pre-med program he struggled with the competitiveness, the big classes, and what he perceived as a condescending attitude faculty had toward students. Several times he uses spatial orientation metaphors to characterize his perception of the relational system between faculty and students. Jim said, "the professors were way up here and they would come down and meet the class and then retreat back up to their high office and were pretty much unapproachable, and we were just kind of left to try and survive." Again, later in the same interview he described himself as the kind of student that "was hungry for some interaction with professors" but believed that they had no interest in "coming down and talking to a freshman [who was] asking those stupid asinine questions." I asked him why he believed professors thought working with undergraduates was "coming down" and he told me the following story.

> Well, that was the way they acted-
> Very, very condescending.
> Whenever I did get them.
>
> It was a chase
> Just to try to get them many times.
> Yeah, two hours a week were their office hours.
>
> I was pre-med and I waited in line.
> The line out of his office
> All the way down the hallway
> Twenty kids
> I waited in line.
>
> I got there early enough
> I was probably 10th.

Teh! teh! teh! teh!
Worked my way up and
He watched me as I walked up
It was still okay.

Get in there
Ask my questions,
And he says
        "any more for you?"
And I says
        "Nope, that's all."

So I turned to walk out
And he goes,
        "Next!"
And the other kid hadn't even opened his mouth yet,
And I go
        "Oh' wait a minute,"
And he says
        "I'm sorry you'll have to go to the back of the line."

I saw that little smile on his face
And I...just..saw..red.

Jim told this story in a manner that recreated the tension and the anxiety he must have felt as a student in that line. I have presented the narrative in verse form, each line a clause spoken as a declaration with a brief pause before the next one. He told it rapidly. This professor is characterized as disdainful and almost cruel which contrasts with the emotions Jim is feeling. He shares his anxiety as he approached his turn, "it was still okay" —to the anger—" I just saw red"—when he couldn't ask another question and was sent to the back of the line.   One major way we are able to comprehend the feelings Jim is experiencing in this story is through the metaphors he uses. Jim uses spatial metaphors to identify relational characteristics between professors and students. Lakoff and Johnson (1980) describe how up-down spatial orientation metaphors have a systematic consistency: happy is up, sad is down; health and life are up, sickness and death are down; high status is up, low status is down; having control or force is up, being subject to control or force is down (pg 15-16). There is no doubt that Jim is describing a power and status difference by describing the professors as "way up there" and having to "come down" from their offices to teach. These are aspects of his undergraduate experience that

made a lasting impact on Jim, and we can infer that he does not want to replicate them as a professor. As Jim says later, "it doesn't have to be like that."

But if there were no special relationships with any of the professors he took classes from, there were others that Jim credits helping him at each turn in his journey through academia. I heard different variants of the following story of how he chose civil engineering as his major. This occurs after his hitchhiking trek and his return to school.

> I was [in my] third year [of] college,
> but I was kind of a sophomore
> probably cause I had changed majors so many times.
>
> I was taking the second organic chemistry class.
> I got an "A" in the first one,
> and these are "weed out" courses,
> you've got to get "A's" in those courses.
> It was very competitive at Davis.
> Oh boy, I hated that.
>
> But I was going to give it a try anyways…
> I remember I had to study that weekend
> for an organic chemistry test,
> because I was right at a "B" and an "A,"
> I wasn't doing quite as well.
>
> And an opening came up
> to raft the Salmon River in California,
> which at that time was not rafted very often,
> it was pretty wild.
> I thought,
>   "Boy, do I study for this test or do I go rafting?"
>
> Well, I went rafting.
> Got a "B" on the test.
> And basically, in making that decision –
> and I knew it deep down,
> I decided not to go pre-med,
> which was –
> I mean that was okay.
>
> But that was the fork in the road right there.
> That was a great rafting trip! Wow!

The friend who had invited him on the rafting trip was also majoring in civil engineering and on the trip Jim was fascinated by the structural artifacts about buildings and dams his friend pointed out along the way. Realizing that he needed to find a new major, Jim decides to switch to his friend's major, civil engineering.

> I'm not quite sure why,
> but I guess I think I respected him,
> both academically and just as the kind of person that he was.
>
> He was very, very, oh, grounded,
> balanced personally.
> And so think I latched on to something about him.
> I thought,
>   "Well, if he likes it maybe it's a good way to go."

Jim also talked about another individual who influenced him in making that decision. He had already taken a couple of medical technology electronics courses for biology majors and had really enjoyed them. He was particularly impressed by the professor who taught the second course because he provided the one thing that Jim so wanted in school, personal attention. Jim said, "He spent some time with me, I remember that. I remember he had kind of a curly beard and was kind of a funny guy, but he would sit and work these problems and I got some extrinsic satisfaction. But I thought, 'Well, maybe I should go engineering.'" There were two people he respected and liked who appeared to enjoy their work, so the decision to move to civil felt like the right thing to do.

It is in Jim's stories about being an engineering student where his beliefs about teaching and learning become clearer. His undergraduate experience was not empowering, and certainly not a particularly noteworthy learning experience. He described to me the strategy he used to successfully complete his engineering studies, when he decided to finish his program as fast as possible, by learning professors' testing patterns, rather than learning the subject matter. He felt than when he finally graduated, because he had gone through so fast and "superficially," that he didn't really "learn that much." This feeling is later validated in his first engineering job. As a professor interested in teaching and learning, these kinds of memories became food for reflection about student learning and how that might be best facilitated.

Jim's own experience as an undergraduate deeply influences how he behaves and what he believes about his profession.

Becoming a Professional Teacher

Jim completes his bachelors in civil engineering and goes to Wisconsin to visit his parents' family. It's 1978 and a very good job market for engineers and a cousin encourages him to get a job. He easily finds work in the geo-tech area in Milwaukee where he stays for two years. Wanting to get back to the west and his home and knowing that he could improve his career possibilities if he specialized, he decided to go back to school at the University of Nevada at Reno where he completes his Masters and Ph.D. and gets his first opportunity to teach.

> I always thought I wanted to teach eventually,
> I mean, why else get a Ph.D. in civil….
> I had already worked for 2 years in Wisconsin
> and I had worked a couple of summer jobs for consultants,
> and decided it just wasn't for me.
> I just – I'm not really a 'true blue" engineer…..
>
> I'm just not interested enough
> and I get bored with the repetitive calculations
> and then I make mistakes.
> Because you've got to pay attention
> and if your attention wanders
> then you can make mistakes
> and I made some in practice.
> Not real bad, but I made some.
>
> But the main thing was the realization
> that it just didn't have enough interest
> for me to really apply myself
> and then go up through the ranks.
> I wanted something different,
> and that's why I'm teaching.
>
> I guess I was kind of falling back
> on what my dad had done.
> What a flexible schedule it has….
>
> But then I always remembered my experience at Davis,
> and how I just could not get any personal attention.

And it doesn't have to be that way.

The first couple of years of engineering can be inhumane.
So many schools just make it a big weed out,
Like what I had.
You just -- I lost -- put in a 300 student chemistry class,
You know, and so forth, these huge classes.
And the smaller classes were taught by teaching assistants.
And just really didn't have any contact with someone
That was a professional teacher
And could recognize kind of what I needed
And showed me -- you know,
Like I might have gotten at a small liberal arts college…

Jim said there were two things from his own experience as a student that he consciously attempted to remedy in his own teaching: the "hands-off" aloofness of the professors which frustrated his attempts at having relationships and the inadequacy of his learning when it came time to apply it in the real world. He thoughtfully modeled his own practice from a few favorite professors he had as a student. One professor impressed him with the enthusiasm for his subject that he shared in the classroom. "I've tried to do the same…to be really, genuinely interested in what I was teaching, or otherwise, I guess the way I'd control that, is if I wasn't really interested, not teach it. You know you get a lot of freedom as far as what topics to teach."

Then he recalled his nights in the library studying for tests:

I knew that I was a good test taker,
and I recognize a lot of students coming through
as being good test takers,
and I also know now in hindsight
that test taking ability doesn't do you much good
once you get out and start working.

And so a lot of the students
who have traits
that will make them good engineers
are suffering as students,
because they're not particularly good test-takers.
And one thing that makes a test taker a good test-taker is,
a cleverness in being able to understand
what the teacher is getting at
with the question…

Even though they know the material,
they just don't have that cleverness
to understand where the teacher's trying to go.
And so, you know, they get tripped up.

I've tried to change my classes
so even people that are good test-takers
have to learn something.
They put reports in,
oral reports,
written reports,
they have to get up and talk about it.
That's where a test-taker like me
would stumble incredibly,
because I just -- this pattern matching,
I couldn't articulate any of the concepts.
And, so… those two experiences as an undergraduate
still kind of give me direction.

Jim believes that the focus on mastering content and assessing it through test-taking is endemic in engineering education and occurs more often than true learning that can be applied to real world situations. He also believes that engineering professors in general, are tacitly aware of this, colluding with each other to keep that knowledge a "dirty little secret:"

I had had a mastery of the fundamental concepts,
but the fundamental concepts are something
that you just can't get like that.
And that's what I should have got
back in the undergraduate class but didn't.
I just barely managed to pass the tests and get out (laughs).
And so when I see my students doing that,
 I just get outraged and I tell them
        "You're wasting your own time
         and you're wasting my time,
         you're wasting everybody's time."

That's what it was for me pretty much,
was a big waste of time.
Well, I got the degree,
I got the job…
I didn't learn anything, so it was a waste.
The professor grading my exam wasted his time

because the whole thing was just a big sham.
…it's a dirty little secret in higher education.
…It goes like this,
> "I promise not to tell your employers
> that you don't know anything,
> if you promise not to tell your parents
> that I'm not teaching you anything."
It goes on all the time.
I believe that to my –
all the way down in here.

And that's one of the things that make me so mad.
My colleagues know it.
They know it,
but they want time to do their research,
or whatever.
Whatever reasons,
they won't lift up the rock,
they won't get under the hood,
they won't take a look
at what's going on
and how come students aren't learning.

No, they don't want to get into that,
so they keep on passing them,
and they know that they're not knowing
what they should know.

Committing to Improving Engineering Education

Before joining the FC, Jim was innovative and thoughtful about his teaching, wanting to provide the kind of hands-on personal experience of learning for his students that was so absent when he was an undergraduate. Through the Foundation Coalition Jim discovered he was not alone in his commitment to teaching. The collaboration and teamwork was tremendously energizing and validating for him, and he took advantage of every opportunity to learn. He told me, "I just didn't dally in the Foundation Coalition and *try* new ways of teaching, I just did it all the way. It felt so right, you know? I said, 'I'm going to ride this until it doesn't feel right anymore. I don't care if I don't get to be full professor or whatever…I'm going to ride it!'"

The TIDE program provided the kind of environment Jim had yearned for as a student. A colleague of Jim's called it "a small college education but at the price of a

state college" and he agreed. Students were divided into small cohorts that stayed together in classes during the freshman year, providing lots of peer support and ample opportunities to form friendships. Students received personal attention from faculty and could provide feedback to the FC teachers about how the program was going and how it might be improved.

In the Foundation Coalition Jim grew as a teacher and learned how to be a leader. In reflecting on that time he said he believed his growth "happened in the right way," by having to "pay his dues" by beginning in the program as a "foot soldier" and working his way up to freshman coordinator, which forced him to lead "a little bit." He gained some administrative skills when he became the FC campus coordinator, but the real leadership challenge was heading the effort to get the TIDE program adopted. It required that he initiate conversations with the provost, dean and other faculty. These were the kinds of conversations that he had never engaged in before. I believe that taking the initiative to campaign for the adoption of a brand new curriculum was a significant event in Jim's life.

> I had talked to our dean before,
> but I had never really asked him for something like this,
> advocated for something.
>
> To me it means
> Believing in something
> and then just working my tail off
> Trying to get it to happen.
> Pouring myself into it
> A huge amount of time,
> and just keep advocating,
> and advocating,
> and advocating.
>
> Some lead by example,
> If they can see
> that you have put tons of your time into it
> that gives it some authenticity –
>   "this might be a good investment"
> partly, it's…in sticking your neck out somewhat.
>
> Our profession really needs change.
> It really needs some change.
> And that's why I've gotten into this.

The Jim who is speaking here stands in stark contrast to the young undergraduate who was drifting and searching for some purpose. He believed that his persistence and daring is not something you see often in academia, and these traits may have helped him convince colleagues and administrators to adopt the new curriculum. In this segment he is aware of how others see him, and that helps him gauge his own growth and learning. This is particularly evident in a story he shared in which a colleague's tells Jim that he saw him as confident and articulate when talking to a group of his peers. At the time, Jim still viewed himself as a "kid that had two left feet," unable to "dance with the department head" or "please the power structure, let alone take on a leadership role." But that changed when he became involved in the Foundation Coalition:

> ..something about my involvement in the Foundation Coalition,
> I'm not quite sure how or when,
> but it seems like post-Foundation Coalition.
> I'm, uh, I'm different.
> And he said a couple of other little things,
>   "You can talk about yourself really easily,"
> which I never would have imagined [anyone] saying about me.
>
> So, I don't know the specifics, but something about it,
> about being involved in the Foundation Coalition
> has kind of helped me find myself
> or be more at ease with myself.

Jim believed that he grew considerably from his participation in the FC. His developed leadership skills and he became more knowledgeable about academic politics and confident in his ability to navigate the political climate on his campus. For Jim, the focus was rarely on the structure of the curriculum, nor the material, nor really the innovative pedagogy. It was the personal experience of being empowered through the process of collaboration and through working on something he could be passionate about and believe in. He commented that some of his colleagues did not understand his enthusiasm, and thought him "crazy" for relentlessly pushing to get some form of an innovative freshman curriculum adopted in his school. Jim wanted to understand "why" his colleagues did not want what he wanted, why they continued to perpetrate the "dirty little secret," why it was not obvious to them like it was to him that the FC innovations,

would improve the quality of the program. Politics, apathy, isolation among faculty seemed to win out in the end, as the freshman program that was finally adopted never lasted longer than several semesters in its original form. Though disappointed, Jim continues to work toward improving engineering education.

Conclusion

In a paper prepared for the 2004 International Conference on Engineering Education, the change study research team concluded that it was not necessarily the cultural barriers within higher education that hindered sustaining the innovations, but the failure of faculty and administrators to engage in conversations that addressed what we called the "harder questions." By "harder questions" we meant those that dealt with basic assumptions and values held by faculty about teaching, learning and curricula -- the tacit and usually unexamined values that form part of the foundation of organizational cultures (Schein, 1992). One of the first steps before engaging in that kind of inquiry is being able to name and describe cultural attributes.

On the change study research team Jim was often the first in our discussions to ask the harder questions. As one of the strongest advocates for the FC reforms on his campus his leadership in the FC placed him at the center of debate about curricular reform. He became more aware of the challenges to change, faculty apathy, competition, isolation, devaluation of teaching and faculty complicity.

Jim presents a self-identity that is more than willing to wrestle with the difficult questions regarding the behaviors, values and norms of the professoriate. Between the second and third interviews I had with Jim, I shared with him the concept of the master narrative of the academy. This concept made sense to him and he became quite candid about his own complicity with the professoriate's failure in "owning up to academic dysfunctions" (Hall, (2002) through examining underlying assumptions and values of the master narrative.

Jim's experiences at Davis epitomized a culture and norms contrary to his personal value system. He was uncomfortable with the competition, large "weed out" classes, absence of personal attention to students from faculty, the focus on performance rather than learning. In contrast, his need for his own values to be validated was met

through individuals, his father, friends and a handful of professors. From his father he wanted a similar flexible and easy-going lifestyle which he attributed to his father's position as a faculty member in a small liberal arts, teaching focused college. The importance of enjoying your work, being enthusiastic about your field was validated in his "goofball" friend in civil engineering and the engineering professor who exhibited his enthusiasm for this discipline in the classroom. These values were mirrored in his experiences while participating in the FC. Jim started identifying the master narrative of the academic culture when, as a student at Davis, he noticed the competitiveness, the power hierarchy and the devaluation of teaching. It is easy to see why the FC attracted him.

Throughout his storytelling, Jim employs an evaluative framework composed of the new values and standards he adopted from the FC that addressed the aspects of his student experience he found so disillusioning. These are characteristic of the counter narrative of reform and in Jim's stories he applies these newly adopted values and ideals of the present to evaluate and contrast with the values, norms and belief systems inherent in the events of the past. It is in this evaluative framework where master narrative becomes delineated. Jim's story exemplifies the clash of these two social narratives, and how through reflecting on their dissonance, he chooses a path that champions one over the other and provides a moral focus for his professional life.

Ultimately, however, Jim's focus is not about effecting change, but about understanding how change occurs. He is curious why his colleagues do not share his commitment to improving teaching and learning, he wants to understand individual resistance to change. He seeks answers to essential questions that probe the underlying and unspoken beliefs about teaching and learning that are held by faculty and that often hinder change.

CHAPTER VI

WORKING WITHIN AN INSTITUTIONAL MASTER NARRATIVE:

DON RICHARDS' STORY

Introduction

  This chapter focuses on Don Richards' story, an FC faculty member who was a leading force in designing, implementing and institutionalizing the FC sophomore curriculum at Rose-Hulman Institute of Technology (here-on referred to as Rose or Rose-Hulman). Many of the strategies he employed to promote and eventually help institutionalize the new sophomore curriculum were congruent with the cultural norms and values of Rose, and I believe that his cultural awareness contributed to its successful adoption. Don crafted a reform narrative that corroborated and upheld Rose's local master narrative.

  According to Edgar Schein (1999), a thorough understanding of one's organizational culture is a prerequisite for any effort at improving or transforming the organization. An example of how this cultural awareness was applied comes from the American Council on Education (ACE) study of six institutions attempting large scale change. The ACE study found that change processes "at each institution were clearly influenced by deeply embedded patterns of behavior, expectations, values, and beliefs about how that institution function[ed]" (Eckel, Green et al. 2001, p. 25). Leaders at each institution had to "craft" change strategies that matched their institutional cultures. The importance of cultural awareness was further refined by a study in engineering education by Elaine Godfrey (2003). She stated that if the espoused values inherent in a proposed change do not reflect the existing culture at an "operational level," e.g., the day-to-day activities, change will be difficult to sustain.

  It is through local master narratives that institutional cultures are accessed as well as enacted. While the six partner institutions in the FC shared many values and norms of academic culture, faculty at individual schools shared a contextualized version of that master

narrative of the academy that was defined by that institution's history and tradition, mission and values, and other particular environmental attributes. The story of the early innovative freshman curriculum effort at Rose that preceded and led to the FC and the FC sophomore curricular change efforts together serve as useful case studies of curricular reform in the context of an institutional culture in higher education. In this chapter they provide the backdrop for Don's story. He crafted a reform narrative that could work within Rose's master narrative.

I begin with Don's occupational life story, which begins as a freshman in college and ends with accepting a position at Rose-Hulman. In the next section I depart from Don's story to describe Rose-Hulman and its institutional culture using data collected for the change study. Having set Rose's cultural context, I then describe the development and implementation of the freshman integrated curriculum, of which Don was not a part, but was a critical observer. I then return to Don's occupational history as he tells the story of the development and implementation of the sophomore curriculum and how that was impacted by the previous freshman curricular reform effort. I conclude with an analysis of how Don read and negotiated the local master narrative of Rose in order to successfully effect change with the sophomore curriculum.

Occupational Life History

Don Richards has been a professor of mechanical engineering at Rose since the fall of 1988. At that time, the Institute was debating the question of admitting women and he immediately became involved in the effort to promote co-education. The decision to accept women occurred in 1991, and Don co-chaired the committee that planned that transition, which finally occurred in 1995. In 1993, Don was asked to be on the campus management team for the Foundation Coalition, and through his leadership Rose adopted the FC sophomore curriculum.

Don's tale is about striving to find an institution and a community that can both support his professional growth as well as his personal values. Though he experienced a major disappointment when he was denied tenure at Ohio State, his story is still a

progressive tale (Gergen and Gergen, 1988), a journey eventually leading to a position at
Rose, where he grew professionally and contributed to improving engineering education.
Don began his occupational history with his entering Kansas State as a freshman in 1968.

> I'm one of those strange people
> who never really looked at doing anything
> other than engineering,
> never really looked at anything
> other than mechanical engineering.
>
> My dad was a mechanical engineer,
> worked for the same company for 45 years.
> I'm sure -- as a younger child
> I'm sure I looked at lots of different things…
> but when I went to college
> I don't think I ever seriously considered
> anything but engineering.
>
> I went to the same school my dad went to,
> Kansas State,
> which probably had the better engineering school in the state,
> at least at that time.
> But that's what you did.
> You went to one state school.
> Even though I went to a college prep high school
> that had kids going all over the place.
> In 1968 you just went to the local state school
> wherever that happened to be.
>
> In college, my …two most significant experiences,
> probably had some impact on what I've done –
> the first one is
> I lived in the first co-educational dormitory on campus.
> This was 1968.
> The December after I got there
> they burned down a building.
> Actually it turned out to be two disgruntled music students
> that burned down the building,
> not a riot.
>
> And the dorm I lived in
> was sort of the hotbed of SDS [Students for a Democratic Society]

and whatever else was on campus at that time
that was sort of radical.
I wasn't, at that point in my life.
I was pretty "white bread" suburbs of Kansas City.
But that's the environment I lived in college.

That's where I met my wife,
when I was a junior in that dorm.
But that was a piece of it,
living in that environment.

And the other piece was
I sang with a concert choir at K State
for all 4 years I was there.
So every day of the week,
I think we met 5 days a week,
I spent an hour singing.
So that was a major portion
of what I did in college.

I mean, I have fond memories of engineering,
but my fondest memories are of this dormitory
and the people that I lived with there
and my college choir experiences.

I mean, I got a degree in engineering
but my fond memories of K State
are those sorts of things.
And the travels
and all the other things we did.

In the first two stanzas, Don introduces his teenage self as a dutiful son who—apparently without question—did what was expected of him. This image of a compliant young man from the "white bread" suburbs is brought into sharp contrast with the radical SDS-like environment of the first co-ed dorm at the university. We see the power of the family plotline—to do what is expected, to go the "local state school"—as it is compared with the decisions of his peers from the "local college prep school" who went to schools "all over the place."

What is interesting about this story is how little it has to do with engineering and academics, and how much it relates to value formation and identity. It foreshadows the main themes of his personal journey to come. The dorm and the choir are symbols that represent important periods of personal development for Don. The dorm was about new ideas and new people, and engaging with the social turmoil of the late 1960's. Anti-war and civil rights movements were strong and vocal on campuses and as counter-narratives they were very alluring. It was an exceptional time in his life:

> That's where you get the experiences
> that cause you to have your life change
> or to evolve or whatever.
> But, so that was real --
> and the late night discussions--
> about the fate of the world--
> in the dorm.
>
> I went away to college…in the fall of 68 --
> the summer after Martin Luther King was shot,
> Robert Kennedy,
> and we had several kids in our dorm
> from the ghettos of Kansas City
> who had just been immediately taken off to college.
> And they were pretty angry folks,
> as they rightfully should have been.

By framing his personal experiences within the historical narratives of the past Don shared how his values changed over time as well. Though he characterized his political stance as not radical "at that point" in his life, it has changed by the time he recounted his story in the interviews.

In addition to his dorm life, another significant experience for Don was singing in the school choir. During his four years in the choir, the group attained a reputation for excellence. His choir was the first one at Kansas State to travel overseas. Again, Don placed this experience within the larger historical context; the choir gave concerts in Czechoslovakia and Hungary during this trip "behind the Iron Curtain." At the choirs' 25th reunion, Don was reminded of how important it was to share that experience with other

choir members. He told me something his choir director shared with the group about excellence:

> When you find something else in life
> that you're excellent at or
> that you can experience excellence with,
> you have another resource for living,
> another reason to do something.

In contrast to the life altering experiences in the dorm and the choir, Don said there was nothing terribly unique about his education in engineering. He held the friendships he had from engineering differently as well by saying the warm choir reunion and sense of belonging he felt to the group, "would have never happened with my engineering buddies." However, in regards to his engineering education, he did share with me a short description of a curricular reform effort in which he participated as a student. He took an upper level course that was using Keller's Personalized System of Instruction (Keller 1968; Sherman and Ruskin 1978). Many faculty across the country were experimenting with this innovative teaching method at that time. The plan's goal was mastery learning of skills and concepts by all students, accomplished at their own pace, through self-monitored reading and writing and eventual testing of each unit of learning. Students could not proceed to the next level until they demonstrated mastery at the current level (i.e., pass the exam, which they could take as many times as needed). Don contrasted its principles to current teaching assessment practice in engineering:

> So, it's -- and it's kind of a novel idea,
> because my experience in grading,
> current experience—things like lab reports,
> is what you're always grading
> is levels of incompetence.
>
> Nobody ever does it right,
> because we don't take time to teach them that,
> nor do we expect them to do it correctly.
> We just lop off points.
> So I hate teaching that kind of stuff and grading it.

But the Keller plan
was one where you had to do it correctly
before you could move on.

Don decided to continue on to graduate school after graduating from Kansas State.
He considered an offer from Purdue, which he described as "a pretty massive place…an
engineering Mecca," but he chose to go to Iowa State instead because he could be "a big fish
in a small pond…that was better than being a big fish in a really, really big pond where
everybody is a small fish." It was at Iowa where as a teaching assistant he had his first
opportunity to teach in undergraduate laboratory courses. He completed his masters in two
years and although he knew he wanted to teach eventually, he decided to work in industry
before pursuing a Ph.D. Work was available in the nuclear power industry and Don ended
up in San Diego working for a company called General Atomic. He stayed there two years.
It was during a period when the nuclear power industry was the topic of national debate—a
time when the slogan "not in my backyard" became commonplace. We see again how he
framed his story within a larger historical narrative.

But it was the time when people
were voting against nuclear power, you know.
It was also a time when – in California
where we could prove that our nuclear power plants,
which were a totally different design,
were significantly safer than the current ones
that already were built.

But you couldn't use that
as an advertisement for yours,
because if yours were so much safer,
then these were not safe,
and those are the ones that were out there,
so politically they couldn't use that kind of an argument.

With the nuclear industry slowing down and the company's success in doubt, Don
and his wife decide to go back to school, he for his Ph.D. in mechanical engineering, and she
for her law degree. A search for an institution where they both could pursue their degrees
ends at Ohio State. A year and a half before completing his doctorate, Don accepts a

lecturer position there, and teaches while he completes his dissertation. His PhD research focused on an area in which he did not have a great interest, but it was his advisor's area and it allowed him to get what he called his "union card, so I could do what I wanted to do." His personal commitment to his family's well-being and his own values take precedence when he makes the next critical decision regarding his academic career and accepting an assistant professor position.

> [We] looked around at other places
> but decided [that I would stay on the faculty there]
> primarily because Ohio State was home.
> Our kids -- one of our kids had been born there,
> we had a really good community,
> we had excellent daycare facilities--
> not to be beaten any place else we looked…

There are a variety of factors that influence the course of an academic life. In Don's case, many of his decisions were based on personal values and desires related to his family and maintaining his membership in the community, rather than professional needs related to his work as a professor. At Ohio State, Don learned the academic game and the rules of the master narrative. Yet the career modeled by his advisor which reflected traditional academic values definitely did not appeal to Don. He said it was a "role model in what not to do, in terms of juggling a life where he was just driven by research and doing more and more things, you know, trying to juggle everything at once and really focused on his career to the exclusion of his personal life, which was a disaster." Aware of the institution's research imperative, Don engaged in research with a colleague and together they received over $1 million in grants, but he had few publications in peer-reviewed journals. Don also chose not to follow the faculty norm to publish from his dissertation work. He told me he placed his dissertation on a shelf and never looked at it again "because it was boring." What he wanted to do was focus on teaching, which he enjoyed over anything, but this presented a conflict:

> I found it hard to do both things at once…

> I hated the conflict…
> And also at a research school like that
> you're always looking for the next dollar…
> And I wasn't very good at that.
> I didn't like it that well.
> I really liked teaching.

He felt he was doing a good job, but just not in the traditional pattern. Additionally, during those five years the department head changed, and with that came increased expectations of faculty. These changes signified a stronger emphasis on research and working with doctoral students rather than the masters students with whom Don had been working. When he came up for tenure, his package evidently reflected his teaching-research conflict: In the following narrative segment, Don reflects on the impact the tenure committee's decision had on his family, his colleagues and himself:

> So, ... February of ... 1987,
> I found out
> I wasn't going to get tenure (long pause)...
> Uh, and I made the decision
> to stay for the last year, ...
> even though I didn't have tenure.
>
> That was probably
> not a very smart decision psychologically.
> It was a good one family-wise
> in terms of my wife and kids.
> But it's fairly hard to work at a place
> at some point ...
> where nobody wants you.
>
> And that's not really fair, too,
> because what I discovered was, ...
> and it happens in lots of things
> but it's specifically true
> with tenure kinds of things in institutions,
> I had a lot of colleagues who were really mad
> and were really upset
> that I didn't get tenure.
>
> But they have lives

and those lives have to go on.
And they can't –
you shouldn't stay as mad as you do about it,
but they can't.
And they go on,
and so pretty soon you're there
but ... you're not there,
and it's all so incredibly awkward.

But I was there for a year.
During my last year there,
I won the college's highest teaching award
and I was informed that I won the college teaching award
the same day I accepted the position at Rose, ...
which is kind of ironic.

And I received it the last year as I left the college
because, I hadn't been tenured.
and I can still get pretty worked up about it.
I try not to do that very often
and I haven't given them any money since I graduated...

…I don't think it made me doubt my competence.
You know, it wasn't
        "Oh, you're not a good engineer."
And I don't even think
it made me really doubt my ability to teach, in fact, you know.
That was sort of the bright spot in all of it.

Uh ... but there's just –
it's very personal -- no matter –
as my department chair said in his inept way,
        "It's not personal."

Well, there's no way you can take it
and it not be personal, I mean,
cause you try real hard to do things and ...
and it was real hard.
Partly because we also really wanted to stay in Columbus…

But that was home.
That was where we were students,
where we met people,
where we did all those kinds of things,

where we got involved in community work,
where the kids were born at home,
we had friends there,
you know, the friends who were there,
we were at the home births of other friends of ours.
So it was a real comfortable place.
And, you know, my not getting tenure
was wrenching in the fact
that we gave that up to come here…

…For my wife and I,
being involved in a community
has become very important…
where your kids are born or
where significant events in your life happen
is the place you want to be,
and that was the place we wanted to be.

And when that happened
we couldn't be there any more.

And we've never really found
a community to replace that.
Terre Haute doesn't have that.
We haven't developed it for whatever reason….

So, you know… I thought long and hard
about not going back into academia….

Being denied tenure was an incredible blow for Don. Since universities operate under an ideology of meritocracy, it takes tremendous personal strength not to believe one is a failure when told you don't meet the standards set by your institution. Throughout the interview process I sensed that Don had a well-grounded and clear sense of who he was and what he valued in his life. The structure of this narrative reflects his desire to maintain that stability by not dwelling on his own pain and grief this event caused him. This structure also mirrors his attempt to maintain a balance between his personal and professional lives, even at this crisis point in his career. Though he is the one person most hurt by the decision, he only refers to his feelings a few times and then, only briefly, because he still can "get pretty worked up about it"… though he tries "not to do that very often." It is also possible to

interpret this narrative as indicating he has worked through the pain and no longer needs to talk about it.

The narrative also highlights Don's sensitivity to the many people affected by his tenure denial and his decision to stay at Ohio the last year. It was a struggle for him not to "stay…mad," while his colleagues' anger naturally dissipated—life for them had to "go on." Don must have felt invisible during that last year at Ohio State with his presence acquiring a limbo-like quality, "you're there but…you're not there." Despite the tendency in academia to associate tenure denial with failure, Don's experience did not lead him to self-doubt. When I asked him what this episode in his occupational history meant for him, Don responded that his self-confidence as a teacher and as an engineer was unshaken.

The largest impact of being denied tenure was felt in the repercussions for him and his family in having to leave their home and community to which they felt so strongly connected. Not wanting to lose that connectedness and sense of belonging to a place that was "home" were the reasons he chose to take a position at Ohio State in the first place, and the reason he stayed through the tortuous last year after being denied tenure. In his study of identity formation, Eric Erikson (1959), believed that identity reflected "a process located in the core of the individual and yet also in the core of his communal culture," {cited in Weiland, 1997, p. 257). For Don and his family, leaving Columbus was "wrenching" because it required pulling up the part of themselves that was embedded in the community, a part that helped them feel wanted and cared for, something the University did not convey to Don.

Besides associating Columbus with significant moments in his family's life, I got the sense that the place was symbolic of great personal growth for him as well. He and his wife were graduate students there and underwent the process of socialization and professionalization that accompanies apprenticeship into the disciplines. He honed his skills as a teacher. He said he developed who he was as a teacher from what he learned from colleagues at Ohio State. In addition, Don saw his values change from the conservative "white bread suburbs of Kansas City" values to the "sort of progressive" views epitomized by the network of friends he and his wife had developed in Columbus. They were members

of a "fairly tight community of mostly attorneys" who worked with his wife. They specialized in civil rights and landlord-tenant issues. He contrasted this community of friends with his academic colleagues by saying, "engineers aren't quite so touchy-feely."

Don's decision was to search in the academic world for a position. He had three offers for work, two positions at research institutions and one at Rose-Hulman. During an interview for a job at one of the research universities, Don found himself in a conversation with a faculty member who had just been hired there, but who was a graduate of Rose-Hulman and who shared his dream to end his academic career by returning there to teach. His advice to Don was to take the position at Rose, because it matched his interest in teaching. Don said that "was good advice….and I've been relatively happy ever since."

The environment at Rose-Hulman was very different from that at Ohio State, and it was also unique within the Foundation Coalition. Because the context of Rose shapes Don's story so strongly, the following section is dedicated to a description of its institutional culture and particular master narrative.

Rose-Hulman Institute of Technology: Context and Culture

Rose is a small private college in Terre Haute, Indiana, which offers degrees in engineering and the sciences. It maintains a national reputation for excellence; for the past five years *US News and World Report* ranked it first in its class (technical colleges that offer a masters of engineering as its top degree). It is a small school, enrolling approximately 1900 students and employing about 138 full-time faculty. Rose is unique in both its size and its mission. For students this means small classes and a high level of individualized attention from faculty. For faculty it means working in an institution that places a high value on teaching and one which is more intimate and collegial than that offered by most larger colleges and universities. When I first visited this campus, I was struck by the beauty of the grounds and the obvious commitment to providing a stimulating and pleasing environment in the buildings' interiors. The Institute has an extensive permanent art collection which is exhibited throughout the buildings on campus, as well as constantly changing temporary exhibits. This reflects the school's commitment to the visual arts, which as stated on its

website, "stems from a belief that the education of the engineer or scientist can be expanded and enhanced by contact with the boundless creative possibilities present in the arts."

In its 128-year history Rose has seen significant change. The school's leaders take pride in its ability to evolve. In recent years changes have included the admission of women and the requirement that all students have laptop computers, both occurring in 1995.   Within the past several years, there has been extensive building and remodeling of the campus facilities. In addition, since 1988 Rose has been undergoing curricular reform attempts—including the FC effort—which started in 1993.

Returning to Schein's (1985) recommendation cited in the beginning of this chapter, understanding organizational culture is a prerequisite for accomplishing organizational change. In order to understand Don's leadership in changing curriculum at Rose I need to first describe Rose's particular institutional culture. Schein defines organizational culture as meaning

- Observed behavioral regularities
- Norms of work
- Dominant values espoused by an organization
- Philosophy that guides policy
- Rules of the game for getting along within the organization
- And the feeling or climate that is conveyed by the physical layout, and the way in which members interact with visitors or other outsiders (p. 6).

In the next section, I use another scholar of organizational culture, Burton Clark, who has studied higher education exclusively, to help identify Rose's institutional culture through the concept of the organizational saga. This concept can be seen as an institutional narrative that makes public several of the attributes of the organizational culture, in particular the dominant organizational values and philosophy that is used to guide policy. An organizational saga is one way of communicating elements of the local master narrative.

Organizational Saga

Rose-Hulman faculty see their school as a distinctive educational institution, not only within the Foundation Coalition but also among engineering schools in general. If culture works as a kind of "social glue" that binds an organization's members together under a

common identity (Kuhn 1996), one way of accessing that identity is through an organizational saga (Clark 1983), or institutional story. Burton Clark (1983) first described the concept of organizational saga in his study of Antioch, Reed and Swarthmore Colleges. He defined it as a "unified set of publicly expressed beliefs about the formal group that (a) is rooted in history, (b) claims unique accomplishment, and (c) is held with sentiment by the group" (p. 374). Clark wrote that organizational sagas are initiated under three kinds of conditions: 1) when an organization is being created, 2) when an organization is in crisis, and 3) when an organization is ready for evolutionary growth. It appeared the school was ready for evolutionary growth in 1988 when Don arrived at Rose, for—as mentioned earlier—it was in the middle of their debate about accepting women to the historically all-male institution.

The focus of Rose's organizational saga is to be "the world's best at undergraduate engineering, mathematics, and science education," a goal first articulated by Rose's president at the time, Samuel Hulbert. He held that office from 1976 to 2003, and several Rose documents credit the Institute's current reputation for excellence to the Hulbert presidency (Pickett, 1999). Campus facilities expanded due to several successful capital campaigns; the size of the student and faculty population doubled while maintaining a student-faculty ratio of 13:1; the institution made the transition to coeducation and the use of computer technology (requiring laptops for students), and as mentioned earlier, since the year 2000, Rose has maintained the #1 ranking in the engineering and technology schools category by U.S. News and World Report. An administrator who expressed concern over the retirement of President Hulbert, told us,

> I think once you see the facilities and the quality of this place, it truly is outstanding… [O]ur president, who has been here for over 25 years and has transformed this place… partly because he has surrounded himself with people that I think are just outstanding in terms of the ability to go out and get funding and resources for us to do really good things. And, he's very, very committed…, he says "we only exist for one purpose and that's for students. And we are going to be the world's best and I'm going to do what I can to see that we are."

It was during Samuel Hulbert's presidency that the organizational saga was written and declared. The commitment to educational excellence was also held by faculty. Those shared values emerged during the interviews at Rose for the FC change study and are described in more detail in the following section.

Shared Values

While the organizational saga focuses on the quality and reputation of the Institute, a more commonly shared faculty commitment is their dedication to the student. In his discussion of the varied contexts of academic culture, Clark (1987) wrote that professors align themselves around three different interests: self-regarding, other-regarding, and ideal-regarding.

> Academics may believe in the academic life because of direct personal payoff, such as the achievement of tenured job security; or because it advances the interests of a larger group—a department or an institution; or because it seems to support a broad principle—scientific progress or enriching the literary culture. Other-regarding interests connect persons to each other; ideal interests bind the individual to general principles that orient action (p. 106).

For faculty, becoming "the best" meant dedication to the student and his or her academic growth. This commitment was very apparent in our interviews for the change study. Faculty members were consistent in speaking about Rose and their professorial life as foremost focused on "what's best for the students." The students are aware of this, a professor commented, "they meet with faculty and they know that they're not second class citizens and that they're really cared for." Rose's student-centered mission attracts faculty who "love teaching," and who are not afraid to "change and try new things." Faculty members and administrators described themselves as being part of a community whose members were "talented" and "extremely creative." An engineering professor remarked that faculty "wouldn't have remained here if they weren't good and they weren't dedicated to teaching. That has been the hallmark of how we hire and how we retain faculty." So, in addition to the organizational saga, the "other-regarding" interest – the overriding dedication to the student – is also part of Rose's institutional culture. It is a commonly-held value held

by both faculty and staff alike, and as such creates a feeling of unity. As a result, most professors come to Rose and wind up staying for the duration of their careers.

Another indicator of this sense of unity is how faculty identified their primary loyalty. Allegiance to one's discipline is more the norm in higher education (Becher, 1989; Bergquist, 1992; Clark, 1987; Kezar & Eckel, 2002), but the faculty members we interviewed identified primarily with Rose-Hulman over their discipline. They often prefaced what they were about to say with "here at Rose, we…," speaking for the whole rather than just speaking for themselves or their department. Rose-Hulman was not a collection of separate programs and departments divided by discipline but an entity joined under a common institutional umbrella, a unified institutional body with a common mission. Faculty articulated a concern for what was happening in other parts of the institution. In the words of the dean at the time, "on this campus, we believe that if mechanical engineering has a problem, then we have a problem." A faculty member from the humanities and social sciences attributed the Institute's ease at adapting to the recent changes to this sense of "oneness" in the school:

> We are one college. So my department is part of the engineering college, we all are. And also because just the size of our faculty. The engineers and the physicists and the mathematicians and the humanities folks talk to each other every day. We have lunch with each other. We're not off in different buildings somewhere. So that sort of coordination and working together comes really naturally to us…[Geographically]…it's much easier for us to all be in this together. And here, in my department, we think of ourselves as engineering educators. Teaching the engineers is not service work to us--it's our job.

This sense of being part of one organizational entity was very strong at Rose. Though there are thirteen academic departments there is not the bureaucratic or disciplinary fragmentation seen at most universities. This institutional unity and its governing structure also create an expectation for inclusiveness. Faculty members expect to be informed about new initiatives. What impacts one part of the institution will usually affect the whole. Thus there are both strong "other-regarding" interests and "ideal-regarding" interests that strengthen the institutional culture.

The high value placed on teaching and learning, the primacy of Rose's institutional mission, and the commitment to inclusiveness categorizes Rose as an example of what Bergquist (1992) calls, a "developmental" academic culture. Within this culture, meaning is derived from furthering the personal and professional growth of all members of the community, and activities and programs are judged based on how well they serve that goal. Most decisions are made through democratic processes, and all members of the community are free to question administrative or departmental decisions and participate in changing strategic or curricular plans. Within this kind of environment, people feel free to experiment and grow, but there is an expectation that what they learn, especially if it could help others in their development, should be shared.

> Even if somebody is going to go off and do their own thing, the rest of the institution has to support it. We have people in this department who do their own thing different[ly] than other people in the department would do. But the support that they have from the rest of the department is real support. It's not "Well you do that and I don't want to have anything to do with you," it's "Oh, you're going to teach that course that way? Fine, that's really neat. I'll learn a little bit from you, I'll talk to you about it. I won't just let you go off and be an isolationist.

In an institutional culture like Rose, faculty members are aware of what their colleagues are doing. There are many informal ways of sharing information, facilitated by the small size of Rose, and a formal curricular change process. Course modifications and adding new and removing obsolete courses are the responsibility of the faculty, and there is a formal Institute-wide curriculum committee in place through which all curricular changes must be approved. Its members are the department chairs and the dean. In order to assure that their decisions represent the Institute, the committee has a rule that if there are two dissenting votes on any issue, the decision gets sent to the entire Institute. The Institute is the name of the formal governance structure in the school where institution-wide issues are debated and voted upon. Every faculty member and staff of faculty rank attends Institute meetings and each has a vote. The President of Rose presides as the chairman.

In summary, Rose's unique organizational culture is distinguished by faculty and student's dedication and sense of belonging to a unified institution that bridges disciplinary

boundaries. There is a shared common mission, epitomized in it's "organizational saga," of providing the best education available to its students. People know what is going on within the school. In terms of my premise in this dissertation, the organizational saga and the concomitant values and norms of behavior can be viewed as a local master narrative. It is through this local master narrative where faculty are encouraged and expected to grow professionally and continue to improve the quality of their teaching.

As part of the Foundation Coalition, there were two major curricular change efforts presented to the Rose community and both appealed to central mission embedded in the master narrative. But the strategies used by the advocates and leaders of each initiative were different. The freshman integrated curriculum was presented in a manner that did not take into consideration the ideal-regarding interests of the faculty, while the leaders of the sophomore initiative, and Don in particular, learned from their predecessors and used strategies that reflected shared values and norms. These different strategies towards implementation most likely influenced how long the programs were sustained.

In the next two sections I describe the development, promotion and implementation of each of the curricular change efforts. The first program was the integrated freshman program, which was the product of a grass-roots faculty effort that started in 1987. It was named IFYCSEM for Integrated First-Year Curriculum in Science, Engineering and Math (later shortened to the IC for Integrated Curriculum). IFYCSEM predated the FC; and many of its underlying principles became the model on which the FC institutions designed their freshman curricula.

Curricular Changes

Freshman Integrated Curriculum

In the summer of 1987, a group of faculty members from math, science and engineering began talking about how the curriculum could be integrated to improve student learning and to remove the redundancies. Two professors were very successful in writing winning proposals for grants to support designing a new freshman curriculum. The result was IFYCSEM, a year-long freshman program designed as a sequence of three 12-credit per

quarter courses. Topics from 11 traditional freshman courses were integrated around four themes: rate of change, conservation, accumulation, and properties of materials. In addition, the design incorporated the use of a computer algebra system. Students received one grade for the 12-credit block each semester. Faculty from math, science, engineering and the humanities worked in teams, planning, monitoring and teaching in the curriculum.

Faculty members interviewed for the change study described the IFYCSEM development team members as "upbeat" and "positive." Team members were excited about the notion of an integrated curriculum and the early development period was extremely creative and energizing for those participating. There was early and steadfast support for the effort from the president of Rose-Hulman and the dean at the time.

The view from outside the group was mixed, however. In early meetings where the program was being presented to other faculty, it became clear that not everyone agreed on the premise of integration. There were strong dissenters in the mathematics department, initially objecting to changing the order of how mathematics principles were introduced and generally unwilling to be flexible about dropping certain topics. Another disagreement was over the idea of helping students make connections. One professor shared how it was a "great joy" for him to realize those connections on his own when he was a student and he believed that a critical point in student learning is realizing those relationships unassisted. Still another disagreement centered on the usefulness of computer algebra programs. But the two main concerns revolved around the efficacy of the centerpieces of the program: the 12-credit block course—giving one grade for 12 credits was problematic—and the notion of integration—which challenged traditional separation of the disciplines and required interdisciplinary faculty teaching teams.

Despite some faculty concerns, the Institute voted in 1989 to allow the innovative freshman curriculum to be implemented as an "experimental" program, pending the award of grants that would support faculty and purchase equipment. The first iteration was in September of 1990.

IFYCSEM/IC leadership's difficulties to achieve full support from the Institute can be attributed to their use of strategies that were incongruent with values manifested in the

local master narrative. Isolation and communication were issues from the beginning. The development team's response to the early concerns about the 12-credit block and integration was to do nothing. They believed that the 12-credit block design was essential to achieve integration, and they did not respond to the voiced objections. The two leaders did, however, ask President Hulbert to appoint a presidential commission of faculty to "provide an external perspective" (Froyd, 1996). The commission served for only the 1988-89 academic year, and while the innovators intended the commission to help with implementation issues, the commission members themselves thought they would have much more input about the structure of the curriculum. There was no agreement on the purpose of the commission, and members had little opportunity to contribute to the development of the program. Resistance grew within faculty outside the innovation effort when they felt their input was neither welcomed nor respected.

Both President Hulbert and the Dean of Faculty at the time purposefully couched the proposed implementation of the freshman integrated curriculum within the framework of the organizational saga, a medium through which the master narrative was affirmed. They viewed it as another accomplishment to add to distinctions that were already part of Rose's crusade to becoming "the best." In the eyes of the President and the Dean, faculty members volunteering to participate on this commission would be contributing to Rose's achievements. However, the "ideal-regarding" interests epitomized in the vision of *being the best* was characterized by one professor as possibly conflicting with the "other-regarding" commitment to *what's best for the students:*

> I think if it were up to the administration that we would adopt [the freshman curriculum] 100%, but for the wrong reasons. Sometimes they want to make moves like that just so Rose-Hulman can appear to be on the cutting edge of everything. Those are the wrong reasons. You want to adopt it because it's the right program for your students. But that's a constant battle that we fight all the time. The faculty tries to analyze the [decision to] change from "what's best for my students'" point of view, and the administration may have another agenda. Hopefully the system is structured so that the two balance each other out.

To their credit, IFYCSEM faculty became aware of the lost opportunities to create a better relationship with the rest of the Institute. A candid assessment appeared in a 1995 engineering education conference paper,

> [I]nsufficient opportunity was provided to suggest changes in the curriculum. Although faculty were informed, faculty believed that they were provided with little or no opportunity to suggest changes which would be implemented. Since faculty believed their suggestions would not affect the prototype curriculum, they began to view [the innovators] as a separate entity, and a "we versus they" syndrome formed. (Froyd, 1995, p. 5)

Another factor that contributed to the innovator's lack of response to the Institute was the considerable workload for the development team – now the teaching team—during the first implementation. Managing and teaching in the first iteration of the program consumed a tremendous amount of faculty time, software was new to professors and students alike, integrated exams and projects took time to develop and evaluate as a team, and addressing student feedback meant altering and refining daily and weekly schedules. In the words of one IFYCSEM faculty member, "we were of necessity on the fly creating all of these links, all of these relationships and everything, we just didn't have time to be sort of more politically savvy, I think. And what you did is you tend to isolate yourself that way." As a result, there was very little communication about the program to other faculty in the Institute, which contributed to general distrust of and negativity toward the new program and the developers as well.

The new freshman program was offered as an experimental program throughout its eleven year existence at Rose. The first three years were rocky. The first year almost half the students transferred out due to what one member of the faculty team said was their "overzealous and gung-ho" readiness to "unleash" all the exciting and innovative ideas all at once. Adjustments to student workload were made for the following year, but IFYCSEM faculty leaders never recovered from this initial "misstep" and the program was viewed negatively by the institute the following years. IFYCSEM—which became known as the Integrated Curriculum or IC—quietly disappeared in 2002 with no formal announcement other than the dean directing the coordinator "not to recruit" students for the following year.

Viewing the story of IFYCSEM within a culture that strongly valued unity and open communication, it appears that the relative isolation of the development team caused strong resistance to develop. The FC sophomore development team which followed on the heels of this strife-ridden freshman curriculum could not build on any successes of their predecessors. Instead, crafters of the sophomore curricular change effort, with Don as its leader, went to great lengths not to have their new curriculum sound or look like the freshman program. That story, told through Don's eyes, follows.

Sophomore Engineering Curriculum

When the FC grant was awarded, Don was invited to join three other Rose faculty to form the team charged to generate an interest within the Institute in developing a sophomore program. Don coordinated the Human Interface Development focus, which Don translated for me as addressing "how do students get along with students, how do students get along with faculty, and how do faculty work with each other?" He believed he was asked to join because he was "involved in a lot of stuff on campus. I don't think I had made too many enemies, so I was a good choice." The project had a strong appeal for him:

> I was interested in some of the things
> they were talking about, the ideas.
> And what I was working on at that point
> was trying to get people interested
> in cooperative learning
> and different pedagogies.
>
> And having come from a research-oriented school,
> once I got to Rose…
> I had looked at things like that before,
> but this was the first place
> where I had sort of carte blanche
> to actually spend time doing that
> and get credit for it.
>
> So I did that,
> and the first year, then,
> we worked to try to sort of interest the campus

in the Foundation Coalition.

The strong negative association faculty had with the IC caused the sophomore development team to purposefully avoid actions or language that suggested any resemblance of their work with the freshman effort. Don's sensitivity and pragmatism helped him craft strategies to assure full and open communication between the developers and the rest of the institute. First they solicited ideas from the faculty for changes in the sophomore curriculum. Then during the spring quarter, they met weekly with interested faculty to discuss these ideas. Don told me he thought this was an important step in the process of keeping faculty involved,

> Probably the most substantial thing we did …
> we had faculty meetings
> on Friday afternoon from 3:00 to 5:00,
> no refreshments,
> and we would have 30 people show up
> to talk about this curriculum and changes.
>
> Some of that, I think, was reaction –
> I mean some of the people showed up
> because they didn't want the freshman curriculum to be replicated.
> Some showed up because they were really interested in the idea.
> Some showed up just because they weren't sure what was going on.

These first meetings set a precedent for strategies that reflected the institutional culture. It was crucial that the reform narrative evolve with input from all. After two months of meetings, a Summer Sophomore Curriculum Development Team (SSCDT) was formed, which consisted of ten faculty members from all the engineering departments, plus math, chemistry, and physics.

They started out the summer of 1994 with a weeklong series of workshops on active and cooperative learning, curricular design, and training in how to work as a team. They adopted the teamwork model for meetings and decision-making and Don formally assumed a leadership position. They also invited representatives from Texas A&M to talk about their sophomore engineering curriculum, as it was a likely starting point for development. The

goal for that first summer was to develop the conceptual foundation of the curriculum. The inclusive aspect of this stage was almost transformational. While faculty shared a common sense of unity and thus conversed often about issues related to the institution, this form of group work was different. Don said, "We had people talking to each other, cross-departments that had never…talked to each other for a long time."

The team prepared a draft outlining their ideas and that fall they made a formal presentation to the entire Institute. This presentation outlined the "skeleton" of the proposed new sophomore curriculum. In order to deepen support for the program, team members visited each of the nine departments. By this point Don had assumed a formal leadership position. The department meetings were intentionally crafted to solicit input from everyone. Don explained their strategy:

> And we always went with at least two of us.
> …Every department, so that's nine departments.
> And we met with the faculty that wanted to meet with us.
> And we had somebody record all of their questions and concerns,
> after which we typed up those questions and concerns
> and we sent it back to them and we said,
> > "Is this what you said and what you asked us?"
> Then we attempted to address
> every single one of those questions
> and give them a response.
>
> … we really wanted to be sure
> we had people's input at that point.
> And again, that was partially in reaction to people's feeling
> whether rightly or wrongly
> that they didn't have input into the freshman curriculum.
>
> I'm not sure that they didn't have input,
> but that they didn't really understand
> what their lack of participation would mean.

Once the departments' feedback had been clarified, the team continued to meet during the semester to reflect that feedback in the proposed curriculum. Finally, March of 1995 they

had an important meeting, committing themselves to producing by the end that meeting a "consensus curriculum."

> We started, I don't know, 7:00 or 8:00 o'clock
> and we brought in deli trays and bread
> and we didn't leave that room
> until we had a curriculum that we could all agree,
> a consensus curriculum,
> that we could all agree to.
> And that was a very interesting meeting.

That meeting lasted for many hours. The team addressed all of the departments' concerns and made several changes in their original proposal. Included in the discussions were issues that the IC team had failed to address: concerns about the placement of engineering design, number of hours devoted to certain subjects, and an important debate about mathematics in the curriculum:

> We also resolved a long-standing issue,
> which was that there was a group of people
> who wanted to have mathematics taught
> as one seamless thread throughout the entire curriculum.
>
> We talked about threads.
> That was one of our words that we used,
> where basically you would start in the fall
> and end in the spring
> and by the time you finished
> you would have gotten the traditional mathematics
> linked to what we were doing in the engineering/science courses.
>
> And there was a strong feeling
> among some of the mathematicians that
> that was impossible.
> That you couldn't mix statistics and random mathematics
> with calculus and differential equations
> and deterministic mathematics,
> and it was just impossible to do that.
> And we finally…resolved that issue.
>
> …We really strove to have a consensus,

and I think that's one of the things I'm proudest of,
is that we didn't want anybody
to walk out of that room and say
        "I don't support this."

And a lot of people gave up stuff
that they had fought long and hard for,
but I really wanted us to have something
that when we walked out of the room
that everybody could say they could support.
And when we left we said
we had a consensus curriculum.

The Institute approved the new curriculum in April of 1995. It came to be known as the Sophomore Engineering Curriculum (SEC). Don acted as coordinator of the program throughout the life of the FC, providing the kind of administrative functions that allowed the courses to be offered as generic Engineering Science courses. He continued in the capacity after the grant ended, as Rose had not created any formal administrative structure to sustain the curricular change.

Conclusion

The story of these curricular change efforts at Rose-Hulman Institute provides an example of the impact that organizational culture, as a critical variable, has on institutional change efforts. Because faculty have primary responsibility for and have control over curricula, gaining and maintaining their input, involvement and approval is essential (Boyatzis, Cowen et al. 1991; Frost 1998). The freshman curriculum leaders, impervious to the values inherent in Rose's organizational culture, forged ahead with their innovative ideas to design a curriculum *for* the institute, believing their innovations would improve student learning. Their insistence that their way was better and their resistance to accommodating— or even listening to—faculty concerns resulted in their isolation and the eventual disappearance of the IC.

In contrast, Don guided the sophomore team to employ inclusive strategies that honored faculty needs and values. Informed by his sensitivity to his colleagues as well as to

the pulse of the institution, Don made sure everyone had an opportunity for input into the development of the new curriculum. Guided by his pragmatism, Don understood that insisting on a perfect curricular product would just alienate faculty and so he ensured an inclusive process for change which involved compromise. The key to the successful adoption of the SEC was information sharing and decision by consensus. They designed a curriculum *with* the institute and congruent with priorities embedded in the local master narrative, ultimately adopting a curriculum beneficial to students.

In an organization like Rose, which is so different from Research I institutions, disputes about what curricula should look like are different. Don, having spent eight years at such an institution before coming to Rose, was adept at recognizing the difference:

> I think you deal with two different cultures.
> One is in a research institution environment
> (or even a big state not class 1 institution,)
> we do what we were rewarded for.
> And if teaching is not valued
> then you're not going to get people to do
> the things that they need, to get better at [teaching].
>
> In our culture, the question is the combat or the resolution
> of what's the best way to teach.
> Because I have colleagues
> who believe integration is the worst thing to do.
> It has no value, or it doesn't have value
> that is commensurate with its cost.
>
> And that physics should be taught by physicists
> and math should be taught by mathematicians
> and don't try to mix these things up.
> And that I'm not sure how you resolve.

In many ways the reform narratives of both the IC and SEC appealed to Rose's local master narrative by declaring their goal to improve student learning. The key to the Institutes' adoption of the SEC was to address individual views about teaching. That was accomplished by first making sure everyone felt heard and had input, and second, ensuring

the final result was a product of consensus. In an institutional culture that does not value teaching in the same way as Rose, these strategies would not have been so successful.

Though change is difficult to measure, Don believed both programs had a major impact at Rose:

> People teach differently than they did earlier.
> They use technology differently than they did before,
> because that group of people got together
> and showed them that you could do it.
>
> Other people said
>   "I can do that, I can adopt this piece of it
>   or I want to adopt this piece of it in my class."
> So, I think those are the things
> that have made this so significant,
> because I think it's had [an impact on] a wide range of changes.

Don also believed that both programs made Rose very visible among its peer institutions and certainly contributed to its high national ranking.

As for himself, I asked Don to reflect on his growth, and how his professional identity and values had changed throughout his professional journey. In the interviews he referred to himself using various terms: mechanical engineer, professor, academic, teacher, educator and leader. I wanted to know what each term meant to him. He answered that, often, when asked to put down his occupation on a form, he's not sure what expression to use. He acknowledged that "professor" had a higher status than "teacher" and was more "honorific" than "practical." "Teacher" meant "that you view yourself in the light of working with students or trying to impart knowledge to help people." "Academic" meant "freedom to study" and do research, even if no practical purpose was associated with the goal of the inquiry. Don said he still refers to himself as a "mechanical engineer" even though his practice is not engineering but engineering education. Don said that "engineering educator" was "probably the truest descriptor" of how he viewed himself. Working at Rose gave him the freedom to call himself an engineering educator and "not feel guilty about it."

He gave the most in-depth response to the label "leader," and Don spoke extensively about his own growth in that area.

> …You talked about being a leader.
> I think my vision of that has changed over the years
> from somebody who, uh (long pause)
> leads independently of the people…
> that they're trying to get to follow them,
> to somebody who leads by working –
> by having a vision of something that is different,
> a destination that is different
> from where people are currently at
> but can't choose that destination
> completely independent of
> where people want to go.
>
> Yeah. I think if you only lead people
> where they want to go,
> you're probably not doing
> a good job of being a leader.
> Or, if you lead people unquestioningly
> where they want to go,
> you're probably not being a good leader.
>
> [Be]cause I think part of that leadership
> is critically trying to decide
> where the best place to go is.
>
> It's the old effectiveness versus efficiency.
> Effectiveness is deciding which wall to put the ladder on
> and efficiency is how quickly you can climb the ladder.
> …so I think leadership involves both.
> Involves critically deciding where you should move
> and then figuring out how to get people to move in that direction.

As a leader, Don was able to discern the master and reform narratives at Rose which preceded the SEC and chart the appropriate direction and strategies for the sophomore change effort. These strategies took the focus away from the curriculum as the tool for reform and placed it on dialogue, mutual understanding and consensus among the faculty. Don knew the effort would be effective if the team honored institutional values and used

strategies that reflected them. Don saw that process was the key to change, and allowed the process to shape the product.

The curricular ideas embodied in the FC are still intriguing to Don and he told me he intends to continue to "champion" those ideas through writing textbooks, conference presentations and journal articles. But his focus remains on people, dialogue and consensus and what's "essential:"

> First of all, they may not understand
> what we're doing
> but they also have a different perspective to contribute.
> You know, they have a different objective than I do,
> … it would be really nice if we…could come together
> and see each other's perspective and understand it.
> And I'm pretty sure that what we've done
> with our sophomore curriculum
> could benefit from some of the –
> if we understood better,
> what their objections were to it.
>
> So, uh, you know,
> trying to keep a dialogue with people like that and say,
> you know -- what is it -- what's essential?
> I think that's one of the things
> that I've learned in all of this curriculum stuff,
> we tend to hang on to things for a number of reasons,
> and maybe underneath it all
> there's really something that's really essential,
> and if we could get to that essential thing,
> and hold it up and recognize it,
> we might be willing to get rid of the rest of it.

We have seen Don's ability to grasp what is happening to him in his life within the context of larger social narratives, the student political movement in the 60's, the anti-nuclear sentiment during his first job in California, and the culture of higher education and engineering education and its particular expression at Rose-Hulman. His ability to discern these larger social narratives and their accompanying values assisted him in stewarding the sophomore curriculum through several stages and finally to adoption. Don found meaning

in his occupational journey through striving for balance between work and family, self and community and ultimately, between the master and reform narratives of engineering education.

He now views himself differently within the academic narrative. Schuster et al (1990) write that faculty careers follow developmental paths through stages that clearly reflect the unique culture of academia and are bounded by advancement in the academic hierarchy through tenure and the promotion system. Don ended his occupational story by viewing himself within a small but unique class of engineering educators who have made their mark and gained a reputation as leaders in the curricular reform movement. When I last interviewed Don, he had just completed writing a textbook and was editing another. He had not taught a full course load in four years and had discovered that there were other ways besides teaching in which he could contribute and be happy:

> I think I could get into writing,
> textbook writing and that kind of stuff.
> And if I could find something
> where I was doing that,
> where I was editing ... in that process,
> educational process,
> I think I could really like that, you know.
> If I could consult with people
> who valued my opinion and wanted it,
> I think I could do that…
> it's not like I have to be teaching ... to be happy.
> I think I could find other things….
> And that's an evolution.

In this chapter we have seen how Don's sensitivity to institutional culture and it's unique master narrative guided the process of change and altered curricular reform outcomes. Don knew it would be impractical to follow the pattern set by the developers of the freshman curriculum that preceded the sophomore FC effort. He also knew that the local culture and its attending master narrative needed to be accommodated in order to assure institutionalization of the curriculum. Don's pragmatism and accommodation worked in this

environment and offers a different example of one individual's strategy of navigating the tension between the master and counter-narratives.

CHAPTER VII
REFRAMING THE MASTER NARRATIVE:
KARAN WATSON'S STORY

Introduction

I asked Karan Watson to participate in my study because she was one of the most influential and powerful leaders in the Coalition. She was a key informant in the FC change study. Her interpretation of the events which led to the adoption of the new curricula at A&M and her insights about organizational change were integral to our understanding of the project's outcomes. It was obvious she was not hampered by being a woman in a male-dominated field, so I was curious and interested in her story. Over the course of the change study and my work on this dissertation, Karan took increasingly powerful and prestigious administrative positions, moving from Associate Dean of Undergraduate and Graduate Programs in the Dwight Cook School of Engineering to the Dean of Faculties in 2001, and most recently accepting the position of Interim Vice President for Assessment and Diversity (December, 2005). Karan was spoken of highly during the interviews for the FC change study so I was familiar with her reputation as a strong leader and capable administrator.

Due to her position, leadership skills and personal power, Karan was one of the primary change agents in the FC story. As chief financial officer for the FC, she had a unique position on the management team from which she could influence the efforts on the other FC campuses as well as A&M. Her learning, especially about the process of organizational change, inspired other leaders in the FC effort to think differently about curricular reform. Understanding the process of organizational change facilitated the adoption of the FC curricula at A&M, the only partner institution to have both freshman and sophomore year curricula institutionalized. There were individuals we interviewed in the change study that credited Karan's influence as a crucial factor in that accomplishment.

I assumed, because of the level of intensity in which she was engaged in the project, that she would have a personal story of change to share. Her story was more about the reverse. In all three interviews, the two for this dissertation, as well as one for the change study, Karan constructed herself as an agent for change in the FC, working proactively to make decisions that were congruent with her values, and aligned with the institutional culture in which she worked. The FC gave her a laboratory in which she could learn more about teaching and learning, a vantage point from which she could study change processes and organizational culture, and an arena in which she could coach others, stimulate debate, and articulate her values. Karan has held a different position from the other participants in this study who labored in the trenches of the effort. Those who helped develop and teach the new curricula naturally, because of their intense involvement, took the eventual outcomes personally. Karan, on the other hand, had her eye on the larger picture and used her influence to remind FC faculty of their commitment to NSF as grantees. This larger picture was about improving the learning environment for all students, not institutionalizing a perfect curricular product. Her leadership was critical to the accomplishments of the FC. Being involved in the reform effort was a natural step along her "trail" of personal growth and learning; a journey informed by her personal values and vision of who she was "becoming."

In her roles as an educator and then administrator, she viewed the master narrative as simply the cultural context in which she worked; it was something that just *was*, neither good nor bad, not something to be overcome nor altered. As an agent for change, improving engineering education meant studying and understanding the master narrative well enough to create strategies that were compatible rather than challenging. The mission of Texas A&M as a Research I institution was clear, so too were the congruent responsibilities and roles of the professoriate. Within its values, institutional standards, and promotion structure, she believed that existing processes could encourage and reward efforts by faculty to improve and enhance curricula and teaching. By the end of the project, she saw that curricular reform, from design, pilot, implementation and assessment, could be approached and viewed as a scholarly activity, like technical

research, and thus could be conducted, judged and rewarded in the same manner. Thus, faculty who were committed to improving engineering education and aspired to ascend the academic ladder needed to become leaders in educational research.

Karan began her occupational life history in high school with her decision to become an engineering major in college. She ends her story in the present in her position as Dean of Faculties at Texas A&M, after FC curricula had been fully institutionalized and the grant was coming to a close. Within this long narrative, Karan had several stories to tell. As she narrated chronologically from her youthful learning experiences to professional and institutional-related tales, three themes emerged and became more focused and delineated: a self concept that embraced her uniqueness and positioned her in the world as an outsider and at ease with change; the influence of elders and mentors; and a worldview and moral philosophy that draws from belief in systems, the goodness of people, and an easy acceptance of circumstances.

Her identification as an outsider is not as she thinks she is viewed by others, but how she perceives herself. In her youth her family moved often, so experiencing change and being a newcomer became something with which Karan became accustomed and comfortable. Over the course of the story she sees her youthful conditioning as an outsider and the viewpoints that positioning affords her as more and more advantageous. The mentoring/elder theme transforms as well. Karan was well mentored as she matured and grew professionally. These mentors had a profound affect on her choices and achievement. Karan desired and worked to do the same for others, while striving toward her personal vision of becoming an "elder" as perceived through her Cherokee heritage.

The moral development theme is the most powerful influence in her stories. At no time did her own moral framework take a back seat in any decision-making regarding life choices or professional responsibilities. She credited much of her moral framework to her upbringing and her Cherokee heritage. Karan's worldview is holistic and ever widening. Her career path allowed her to address a broad array of issues related to engineering education, and higher education in general, rather than a narrow focus normally found in technical research. Like other successful women who have found

their niche in academia (Aisenberg & Harrington, 1988), she strove to integrate the personal, professional, and spiritual parts of her life.

This chapter presents several stories to illustrate the development of these themes. In the next section they are presented in the order they were told to me during the interviews. Karan has an organized self-understanding, an awareness acquired through frequent self-reflection. Her occupational life history is a tale of the growth, development, and maturation of this self-knowledge. Karan introduced the themes in the early stories as single ideas. By the end of her occupational history, these themes are integrated into a seamless sense of identity whose outsider standpoint and moral compass contributed to her ability to be a mentor and elder to others. In the last section of this chapter, I conclude with an analysis of how these themes become integrated and shape how Karan approaches the constructs of master and counter-narrative in the academy.

Occupational Life History

Though the numbers are increasing, there are still few women in engineering and engineering education, so the personal stories of women engineers attract interest. Karan has often been asked to share her story, sometimes to women's groups like WISE (Women in Science and Engineering), and in classes studying women in education. Her story, however, did not sound like a rote recitation of a frequently told tale. Congruent with the definition of the life history, where each telling provides an opportunity to recast one's life (Linde, 1993; Riessman, 1993), Karan's tale seemed fresh and unique.

The next section presents the story of how Karan came to choose engineering, and shows how she begins to construct herself as unique and different. Her father's support and encouragement contributes to Karan's choosing engineering as a major; his influence as an elder reappears in a later story. The second section focuses on her experience as an undergraduate and she develops her self-perception as an "outsider and an anomaly." Karan's first job out of college provides the context for a major transition in the next section. We see her father's influence again, but this time his advice is not

about what to do, but about how to think and what to consider. This leads to a significant step in the formation of Karan's life philosophy, a step in her moral development. The next section deals with her socialization and growth as an academic and academic administrator at Texas A&M. Mentors appear to help guide her through the academic maze and make choices about the opportunities and options that are before her. Academia affords Karan an insider stance and she sees that insider/outsider positionality can be a choice. The final narrative segments relate to Karan's work in the FC and her influence in that program, as an insider and outsider.

Karan is a thoughtful speaker, pausing often—sometimes for what seems a long time—before completing her statement. She speaks slowly, placing emphasis on certain words, sometimes to make a point, sometimes only because the stress is appropriate to the natural cadence and poetics of her speech. In this chapter I use italics to reflect that emphasis.

Choosing Engineering

I would probably start… by saying…
I've always been a *tom*boy.
Probably most of the people you interviewed didn't start there,
but it's relevant… to my, *my* trail, I think.

And in that capacity
I always…worked a lot with my father,
[He was] not an engineer.
But he worked for a utility company
and he knew a lot of engineers...

I think if he had had more… financial,
economic resources, stuff like that,
he might have been an engineer
but he has an associate's degree.

But he… *loves* to do projects
and he did projects *all* the time.
And since I was *small*,
I was always… hanging around him
and became one of his best helpers.

[I] learned what tools were,
[and] how to use them in projects,
and liked to *build* things *with* him
and *do* things *with* him.

And so…that aspect of *solving problems*
and figuring out how to do something
and put it together
and have it *really* be effective or work –
whether it was a…tree house,
or learning to help him with the lawn mower,
it didn't matter.

So it wasn't so much that we were *highly technical*,
it's just that we did *projects*.
You fixed things,
you built things,
you did things,
you poured cement.
You did all kinds of stuff.

And I was the child
that *did* all of these things with my dad.

And much to my mother's…*credit*,
she's *not* ...a projects kind of person,
but she was absolutely okay with her daughter
doing...those things, too.

So…I wasn't *impeded*
in those kinds of activities *either*.

I was *able*, and I think…
I don't think you can *prove* this or not,
but I *think* there is…an *aspect*,
from what I understand, of
spatial reasoning… that… often..
does or doesn't get developed.

I don't think it's so *innate*
that you're either born with it or not.
I think you may have
some more tendency to be skilled at than others,

but not a… *huge* difference.

But I think depending on what you get to *do* as a child,
it may develop different[ly].

And I think that *often*
because of how *girls* …are *taught* ..to do things,
they don't develop those *same...* spatial-…*type* skills.
It doesn't mean that they don't have other skills
that are *more* finely developed.

But, I *got* to develop… those skills,
while still being socialized… to be a girl, as well.

And I think that those are some of the skills
that…help more with abstract reasoning.
Not so much reasoning in general,
but abstract reasoning.
And abstract reasoning
is a *fundamental* skill necessary
for *real* mathematical… success.

And so by the time I was in high school,
I think I had… *demonstrated* an unu-
a *higher* ability than average.
Not outstanding,
but in *math*,

and I was *comfortable* with that.
Even though I was going very *rapidly*
into the kind of math courses
that there were fewer and fewer… *girls*,
even *people*,
but certainly fewer and fewer girls going into.

And I was *set* on becoming
a math teacher or a science teacher.
I didn't know which.
And that was my *plan.*

I had come down to yeah,
I *liked* math,
I *liked* science,
and I didn't want to do it as a hobby,

and the only thing I had *seen…modeled…*
along those lines,
that I thought would capitalize
on some of my unique.. *skills*,
was *being* a *teacher*.

And I went away to college at Texas Tech.
well, I interviewed here –
I interviewed a lot of places,
but I *went* there.

and they were talking to me as I talked to the education people about
what I needed to do was *decide*,
because I needed to either be a math major or science major,
so I needed to decide which one was my favorite.

And that was really *hard*..
for me..to try to..figure out
well was it chemistry,
was it physics,
was it math,
was it this or that.

So.. my *father* said,
     "Well, I don't know much about engineering and the curriculum,
     but.. I think maybe we should go talk to *them*
     and see what *they* have to offer."

And that's the *sole* reason
that we went over there.
And this was in.. about 1973 or 74,
when I was a junior or a senior,
I don't remember precisely,

and they were *so excited*,
which.. doesn't necessarily happen
 to *every…* woman in that time frame.

But *whoever* was *there* at the table
talking to students on that day was like
     "*Oh.. yes*, we *need,*
     we need women to go into engineering."
And he asked me some things
and he said

"See, you get to do both math and science in engineering."

So it was
    "*Oh*, I don't have to *pick*."
So that's why I'm an engineer,
cause I didn't have to pick
which one I was going to do.

And so, *without.. knowing.. really..* anything other than
being reassured by my parents.. that
that it would be okay
if I wanted to *be* an engineer,
I *opted* to go *into* engineering

Karan had to choose next a discipline within engineering as a major. Her choice was based on her answer to a question posed by the recruiters from Texas Tech, "what science do you like the most?" She told me, "Um, at that point in time, I liked my physics teacher in high school better than my chemistry teacher in high school, so that's why I picked physics and then they asked a couple more questions and boom! I was a double 'E'." She followed by saying,

So, I'm naive enough to believe enough in systems
and that things work out
and I don't look for evilness in all things,
and double E suited me.

I think I would have been just as suited
to be in one of the other fields of engineering
or a teacher,
or other things,
but it suited me fine.

This story is an interesting example of what Linde (1993) refers to as creation of causality in the choice of profession. Linde asserts that for most people it is important to make their life story coherent, to fit the pieces together in a way that makes sense, and to indicate purposefulness rather than lack of agency in determining their life course. Showing intention and purposefulness would be judged as "adequate causality" by

American cultural standards, another master narrative by which we are influenced. In this last passage, however, Karan states that she naively believes that there is some kind of inherently good system at work which affects her life course. While she cites her experiences with her father, and her skill development and natural aptitudes, there still is a hint of serendipity in her story—she was in the right place at the right time. The point of her narrative is that the belief things "work out" allows her to be easy about her circumstances, and even content with different outcomes.

In this first story of her choosing engineering as a field of study, all three ideas are introduced. She begins by claiming her uniqueness among my study participants by "probably" being the only one to claim a "tomboy" identity as a starting point to an engineering career. Karan has obviously thought a lot about her childhood opportunities and their affect on her occupational choice. The tomboy identity frames her activities with her dad as an unusual activity for a young girl. This father-daughter apprenticeship fostered development of skills and ways of thinking not typically nurtured in girls. She establishes her uniqueness which is embellished as she continues on to excel in math and demonstrate "a higher ability than average" in courses where there were "fewer and fewer girls, even people." She focuses on this distinction again with a comment about how excited the engineering recruiters from Texas Tech were at the possibility of enrolling a woman into their engineering program, "which doesn't necessarily happen to every woman in that time frame." Karan entered college in a time period in higher education—and in particular engineering education—where the effort to increase women and minorities in certain disciplines was just beginning. We see that Karan's unique characteristics: being a bright, capable woman in a male-dominated profession has its advantages. Doors open for Karan. She will always be aware of that, but also thoughtful about choosing through which doors to walk.

Her father and his influence is the first instance of the elder/mentor theme in her narrative. Her comment in the second stanza draws attention to her father as someone special; he is the one who suggested she consider entering engineering and talk to the engineering reps from Texas Tech. He is depicted as a gentle, self-effacing man

committed to guiding and supporting his daughter while at the same time letting her set her own goals and make her own decisions. She credits her mother as well, for accepting her "tomboy" nature while still providing her the socialization as a woman.

Karan's moral outlook and its development is a prevailing and critical element in her story. Dana Jack (Anderson, 1991) states that identifying moral language allows the researcher to

> …examine the relationship between self-concept and cultural norms, between what we value and what others value, between how we are told to act and how we feel about ourselves when we do or do not act that way. In a person's self-judgment, we can see which moral standards are accepted and used to judge the self, which values the person strives to attain. (p. 20)

Karan's moral statements describe the kind of person she strives to become. Her belief system is also reflected by the progressive nature of her story trajectory. Narratives of the self have been categorized into three types, stable, progressive and regressive (Gergen & Gergen, 2001). Each type of narrative is distinguished by how life events are evaluated by the narrator. If life events reflect little change, then the narrative is called a stability narrative. A regressive narrative of the self reflects a downward and negative trajectory; the protagonist fails to rebound from or deal with failure, disappointment or tragedy. Progressive narratives are indicated by consistently positive evaluations. Events lead to growth and good things. Not only is Karan's self evaluation of what happens to her in her life consistently positive, but this positive outlook is a foundation of her belief system. She attributes her belief in systems in which "things work out" to her naiveté, and then adds something intriguing, "and I don't look for evilness in all things." This belief system helps her be "comfortable" and okay with the way things are. Circumstances "suit" Karan.

In the next section dealing with Karan's undergraduate experience, she continues to be unique in her surroundings, and the framework of being an outsider emerges. It is a part of herself she sees as working to her advantage.

Undergraduate Education

Karan said she had a "fun experience in college" and got "to play" in three different arenas: the academic, the dorm, and within her cohort of engineering students. In all three areas, she felt like an outsider,

> Once I started college
> I wasn't quite in with the guys
> Because I was one of the few women there
> I wasn't really in with the women
> Because I had this really weird major.

> Academically, she received attention for doing well in a male-dominated field.
> In the woman's dormitory she was an outsider because she was the only
> engineering student among mostly education majors,

> ...so it was like a whole different world
> and you engaged in their world,
> which was totally different
> than where your classmates and stuff were.
> It was like two complete different things.

The third arena was the cohort of thirteen students who, like her, were "off-sequence," either because of advanced placement (which was Karan's situation), or because they were a semester behind. The group consisted of herself and twelve men, six veterans from the Vietnam War who were older than the norm for traditional students, and six other men her age. This group would occasionally do things together socially, and the older men would behave as "big brothers," taking care of her and making sure she felt included. In this environment, others attempt to bring her in, but she still remains unique with special status as the only woman in the group,

> So it was nurturing in many ways,
> But it was an unusual kind of environment.

> And they would protect me,
> …So I think they probably had learned a bit about life in Vietnam
> and had a different perspective on things,

so they had an opportunity
and they didn't want anybody to get messed with
So that worked to my advantage.

In these three different contexts, Karan's gender, choice of academic discipline, and exceptional abilities contributed to her self-image as an outsider, as someone who is not easy to classify. And as an outsider she occasionally was not expected to abide by the norms of the local master narrative. During the timeframe when Karan was in college, engineers were at a premium and recruiters would come to schools to scout for future employees. Karan used this setting to describe her sense of being viewed by others as "an anomaly:"

…and I never had a real job interview the whole time
I mean it's so unusual
that I was used to being kind of
both an outsider and an anomaly
that got positive attention.

And I think I pulled my share of the weight,
but I didn't notice any real negativity from any of that.

And when I say I didn't have a real interview,
I mean when companies would come to interview,
I mean everybody would be in their ties and stuff
and trying to get on the interview list.

And I would be walking down the hall in my shorts
and some professor would say
        "Hey, this company wants to talk to you,"
you know and they would offer me an internship for the summer
and stuff like that.

So, for me personally,
being for a variety of reasons,
fairly comfortable
with being a little bit of an outsider,
this worked to my favor.

And I think I was comfortable

being an outsider
because my family had moved a lot.
I went to several elementary schools,
one junior high,
and two different high schools.

So I was used to when you move to a place
you're a little bit on the outside
and I think that whole conditioning
stayed with me beyond that.

Karan's perception of her peripheral status never impeding her achievement is powerfully supported by the imagery in this story. Not only is Karan in her shorts among male students in suits and ties, but while her peers are playing by the rules by dressing professionally and requesting interviews, Karan is unfazed by what is occurring around her. There are no negative consequences for not playing the game, however, for Karan is sought out by companies and offered opportunities. She makes it clear, however, she pulled her "share of the weight" and sufficiently demonstrated her abilities to warrant receiving these opportunities.

By viewing storytelling as a theory-building activity (Ochs, Taylor, Rudolph, & Smith, 1992), we can delineate the elements of Karan's rationale for claiming her outsider/anomaly identity. Up to this point in her occupational life history, her uniqueness is established through her tomboy nature, the father-daughter apprenticeship in which she developed spatial and abstract reasoning skills, and her exceptional ability in math and science. By frequently being the new kid at school, she got used to being an outsider and was comfortable with that status. Her outsider status never denied her access to opportunities for achievement and growth. Instead, all of these factors worked to her advantage. She is viewed as an anomaly because we would expect that wearing shorts, not being in the "in" crowd, and being a woman in a male-dominated domain would be disadvantageous to her career.

In this story, Karan has integrated the outsider distinction into the coherence structure of her life story, and at the same time transformed what one would assume to be a liability into an advantage. She also is putting me at ease, reassuring me that the

status of outsider was perfectly comfortable to her, and alerts me to future references where this will continue to work in her favor. In the next story involving her first job after college, Karan judges whether her situation and its future possibility is congruent with her beliefs and values.

A Major Transition

        After receiving her bachelors degree, Karan went to work for AT&T and was placed in their management development program. Though she enjoyed the work and she did it well, she was feeling that the job was taking her away from her technical training too fast. When they offered her a promotion, which involved moving to New Jersey, she was faced with a major professional and personal dilemma. Upon reflection and some guidance from her father, she decided to decline the offer and leave the company. Karan told me this story twice, which attests to how she views its importance in her occupational history. The version that follows occurred in response to a question posed in our second interview about important periods of change; could she recall any incidents in her life where she experienced significant transitions that shaped her beliefs or values? The narrative is presented in three parts. In the first part Karan sets the scene and introduces her dilemma. In the second part Karan shares her interpretation of her father's work ethic and how she understood his advice about resolving her problem. The last part describes her decision and subsequent action.

        <u>Part I.</u>
        One of the biggest… transitions …for me
        was when I quit my first job
        after my bachelor's degree.

        Because I was…
        I was on a very fast pace
        in a direction that a whole lot of people thought
            "That's the direction for you."

        And I'm not sure that they were wrong,
        but I'm sure it wasn't a direction that I was committed to.

So when I asked myself
  "Is what I'm doing important, does it matter?"
I couldn't get a "yes" answer,
And…so I had to reflect a lot on that.

And, I was doing all the right things
to make a lot of people proud
and impressed
and happy.
But I don't think I had stood back and said,
  "So if this were your last day
  is this what you want to have done?"

And, uh, so at a fairly young age
I said,
  "I just need to think about it this way."

Part II.
I got encouragement,
I don't know if he meant it this way,
I think he did, but I'm not sure,
from my father
to think about things a different way.

And I had mentioned before…
that my father was one of those people who
just hunkered down and worked hard and excelled
because he was a good thinker, a good worker,
took risks, but, you know, took care of things.

You know, he's one of those people who,
you know, if he died,
he's taken care of everybody.

But what he said to me was,
he thinks that maybe he would have traded
a few of the days he was working so hard for tomorrow to be okay
for the todays, if he had to do it all over again.

And my interpretation of that is,
that as much as he worked
and worried
and sacrificed

because in the long run
　　　"this is going to be the right thing, it'll pay off."

He could be a great provider
and he can take care of the whole clan,
…which I'm very grateful for…
as he reflected on it,
he probably sacrificed a lot of the moments to do that.

So, … he said that to me one night
when they were talking in the company
about transferring me to New Jersey,
which was a promotion,
it was step,
it was on this fast pace.

And I really didn't want to go to New Jersey…
just personally and socially in my life,
it's not what I wanted to do.
But it was what you were supposed to do
and it's what everybody who's on this ladder
is supposed to do next.
And it's a – it's a good sign
that they're going to do it for you early
and all of this.

Part III.
But I was like –
and so I talked to him,
and then that night again,
in a relatively short time,
maybe I'm impulsive,
but I'm at ease with that, too,
in about a 24 hour time period, I thought
　　　"Nope, not going to do it.
　　　And because that's the right thing to do with this group,
　　　um, I think I'll just quit."
And so I did. (chuckles)

Karan tells her story by juxtaposing three voices in the narrative: the people in
her company, her father, and herself. These voices are represented in embedded dialog
as well as paraphrased and interpreted by Karan as she narrates. Their interaction in the

narrative mimics the dialogic nature of her problem-solving process and helps her as she negotiates between the expectations of her work milieu—the local dominant narrative—and her personal desires and commitments as they are informed by her father's counsel.

This is a rich and complex story, with a dichotomy of values and possible actions aligned along the metaphor of the career ladder, and presented by the three voices. Early in the narrative in Part I, Karan positions herself with respect to the opinion of people in her company regarding her next step on the ladder, personified in the direct quote, "that's the direction for you." She has begun to climb at a "fast pace," "doing all the right things" to impress others and make them "proud" and "happy." But the next "step" would require her to move to New Jersey; a major change that challenges her developing commitment that her work should "matter." It poses a dilemma. Karan begins to dialog with herself by asking, "if this were your last day, is this what you want to have done?" Her response, "I just need to think about it this way" foreshadows her father's advice and her interpretation of his past choices which occurs in Part II.

Karan's depiction of her father's work ethic also gives voice to the dominant social narrative about the responsibilities of a father and husband in our culture. He abided by that narrative in being a "good thinker, good worker" and taking "care of everybody." The power of the company narrative and the associated expectation of Karan is compounded by obligation. Karan should be grateful; the promotion is "good sign" and it's coming to Karan earlier than would be typical. Her father's rationale for working hard parallels the company's inference in the directive of what one "is supposed to do"—"this is going to be the right thing, it'll pay off." Yet, by his own admission, "if he had to do it all over again" he would do it differently. When her father shares his regret at sacrificing his enjoyment of the present in order to ensure a secure future for his family, Karan sees how the move would cause a similar sacrifice for her "personally and socially."

Karan resolves her conflict quickly and is at ease with the fact that it might be perceived as "impulsive." In the last part of her narrative Karan shares that she decided not to take the promotion; there was a master narrative embedded in AT&T's career path

to which Karan could not commit. It was not congruent with her values, and because in this particular company context, choosing not to play by the rules meant not playing at all, it was appropriate to leave AT&T entirely.

Solving this dilemma creates a major turning point in Karan's life. It would seem on the surface that the big transition is the movement from a promising career with AT&T to a completely different path. I believe, however, that Karan is speaking more about a transition in her moral development, a solidification of her values, and an acknowledgement of the contribution her father made to the principles she would use to guide her future life decisions. In this event, two moral principles emerge that will guide her life choices. These resurface later in her occupational history. Her choices will be informed by whether actions will make a difference and whether she would be content doing it if it were her "last day."

After quitting her job, Karan moved back to Lubbock and submitted her "one-page resume" to a headhunter. "Within 24 hours I had three job offers" and Karan accepted an offer from a small consulting company that installed communications systems in rural areas. Again, other than the secretaries, she was the only woman in the company. Karan enjoyed that work, but it was a small company with limited growth potential. She decided to enroll in some graduate courses at Texas Tech.

Her return to Texas Tech was a boon for her department as the Dean had just set up a competition in the college to graduate the first woman with a PhD, an instance of the serendipitous convergence of opportunity with her unique qualities. They persuaded her to come back to school full time, offering her a little over half of what she was earning as a full-time professional. Karan begins to receive the socialization and training that will prepare her for her future work in the academy. For the first time, she speaks of herself, not as an outsider, but as someone purposefully brought in from the periphery.

> But they also worked hard to make sure
> that I wasn't left out on the fringes.
> So they were very inclusive,

and what I see or have seen a lot in our graduate programs,
and I've tried to get a lot of people to understand that,
is we will go sometimes
in an effort to diversify our graduate students
and recruit very hard to get somebody
and we will set them up as an outsider
and leave them out there.

So we'll give them a fellowship instead of an assistantship.
Well that's a good thing, right?
Well it is until it's time to do your research
and in a lab-based field,
if you're not integrated into a lab,
when it's time to do research,
you're going to have a really hard time
doing the research.
So the fellowship often puts you outside,

…So if you really want it to be a total plus,
you have to not only recruit hard
and give people what they need to come,
but you need to make sure …
that you have them integrated into the environment.
that's not just for the short term but for longer term,
you've got to make sure they're successful.
These guys did that.

Karan speaks here not just of her own experience, but how she tries to influence others to replicate it for their graduate students. In engineering, in lab-based research, outsider status is detrimental. In the sciences and engineering, collaborative research is the norm (Weidman, Twale, & Stein, 2001). It is critical to be part of a group and a network in order to be successful in academia. Karan saw how being integrated into the academic community allowed her to be successful in graduate school. Research on women in academia in the 1980's shows that Karan's positive experience was the exception to the norm (Aisenberg & Harrington, 1988). Graduate students are dependent on others for the appropriate socialization in order to become insiders (Weidman et al., 2001). Karan obviously benefited from her advisors at Texas Tech. This does not mean, however, that Karan dropped her outsider status. Outsiderness is

becoming multidimensional for Karan. There are times and environments when we are all outsiders, and there are times and environments when we can choose to assume an outsider position. Karan can choose now, and this affords her greater perspective.

Having gained positive research, administrative, and teaching experience, she graduated with her Ph.D. Thinking that work in both academia and industry are in her future, but that it would make more sense to teach and work in academia first because of the lower salary, she looked for academic positions. She had several offers from universities, but wanted to stay in Texas. She chose Texas A&M because of the quality of the engineering program. The next section is devoted to her early experience as an academic and her attainment of tenure.

Getting Tenure

While Karan may have received the technical training in order to continue in an university environment, she was unprepared to enter into the academic game governed by the master narrative at a Research I university. Karan began her work in academia very naive about the research university culture. For the first two years as an assistant professor, she was left on her own. No one made an effort similar to the one she experienced as a graduate student to bring her into the departmental community. Fortuitously, in time to create her tenure package, a senior researcher in her department offered to mentor her. The following story describes this relationship and details her bid for and achievement of tenure.

> So when I came here in 1983…
> I didn't even know all the rules about tenure
> and promotion
> and prestige
> and Research I
> and all of that.
>
> …I mean when I think now about how naive I was –
> when the department head said
> "Do you have any questions?"
> when you're interviewing, I had none.

On the one hand
I felt nurtured and mentored
in the sense of people encouraging
and giving me opportunities to succeed.

On the other hand,
on some of the nuances in the politics,
I was very protected from.
And it never worked to my disadvantage
but it could have, and I recognize that now.

So I came here and things have always been,
for my particular situation, positive.
I'm not saying there haven't been incidences that bugged me
or particular people that bug me,
but my colleagues, for the most part,
have been very supportive.

I don't think they knew
what to do with me when I first started.
So they didn't warm up.
But about 2 or 3 years into it,
a very senior guy who is very successful,
who wasn't in my area of research,
came down and he said
        "You're not going to hit it off this way,
        and if you will have me I will help you."

So he came and he offered,
and we talked about it
and he helped me meet people with funding…
he helped me meet the right people to get external evaluations.

When it came time for tenure.
He helped me get some stuff published,
that I'm not sure with just my name
it would have gotten published…

I know he didn't get anything tangible from it
in the sense that they said
        "Oh, if you do this we'll reward you."
I don't know if there was more than him that discussed it
and he decided to do it,

but he did it
because it was the right thing to do.

He was in the department,
he wasn't in my area.
It's a large department.
It has 45 faculty
and there are in about six to seven areas,
and his was very distant from mine,
but he found a way to make it work
and to help me and stuff like that.

I don't have a desire to be
and I don't think I'm an outstanding researcher.
I think I'm an outstanding teacher.
I think I'm excellent at service
and pretty darn good at administrative kind of things.

But to have succeeded at a Research I institution
in a fairly tough department,
I think I'm capable of doing research,
and I like teaching students to do research.

But even this guy, to this day,
that mentored me so much will say that
      "what you like about the research
      is getting to work with the students,
      not the research for research's sake."
I think that's fair and that's true,
but you still have to be somewhat successful in it to stay here.

So, I praise him a lot still for having taken that initiative.
I'm fairly shy and I would not have asked for help.
Even though I knew that the annual reviews were telling
      "Oh, you're doing good over here,
      but you're going to have to do better here."

And even when I turned in my package at the end of 5 years,
my first instinct was to tell the department head,
      "Based on the annual reviews
      where you've told me that I have to aim
      to have a lot more publications
      and stuff like that,
      I think maybe I shouldn't even submit my package.

I can search for industry jobs and we'll all be happy."

And he was like,
"No, no, no. Wait!
Come in, you've got some really good things, you know,
these packages always balance different ways."

So there again,
I think that they didn't give me tenure
because I'm a woman,
but I'm not sure... they would have worked as hard
to give me the time to develop in all of these areas
and for them to be able to say
"Yes, this package is right,"
if I had not been just a little bit of an outsider.

On the other hand,
I think what I do for them is valuable,
so I don't want to diminish that.

I'm putting a lot of this in context
of me as a woman in this situation,
but that is a lot of the perspective
of what I've dealt with and come to deal with.

All three themes are powerfully illustrated in this narrative and we begin to see how they are inextricably integrated, this time within the context of the master narrative. On the surface this story is about getting tenure, but it also is about how Karan learns how to play the game and work within the master narrative. By doing so she chooses to reposition herself from her outsider position to that of an insider. A mentor has a powerful influence and facilitates this transition. Lastly, Karan shares another aspect of her moral compass. Karan makes it clear that her advancement in the academy is a result of hard work and valuable contributions, and not due to any special considerations given her because of her gender. She judges her own and other's actions to be morally acceptable; in this context, being offered and accepting assistance, working towards and achieving tenure, were all the right things to do.

Karan is now fully immersed in academia. Similar to her graduate school experience, she is again brought into the community by someone's extension of support. Karan's initial isolation which protected her from the nuances of academic politics could have worked to her disadvantage. But her mentor's intervention prevented that. She learned what to do, in terms of research and publications, and also came to understand the research university culture. By the end of five years she has learned about the basic values and norms, the importance of hierarchy, prestige, and extrinsic rewards. She became aware of disciplinary isolation, even within her own department. All of these values could have impeded her growth and success, but a senior faculty member bridged the gaps they created and helped Karan be successful.

This early mentoring was critical. In effect, his guidance and collaboration bridged that gap created by her newcomer status and her gender, and it familiarized her with the master narrative. This is a remarkable thing. Karan signifies this too, by emphasizing the difference in their status and their separate disciplinary specialties. Providing networks, evaluators and co-authorship, he literally ensures her package is sufficient for tenure.

It is remarkable because of its absence of struggle and angst. As she approached the tenure decision, her ease with the possibility that it could be denied reflects a strong sense of self—a person who is not affected by others judgment of her academic strengths or weaknesses. What matters to her is own assessment of her work. She knows she makes a valuable contribution, inferring throughout that her commitment to making a difference and doing what matters is being met in her work.

It is important to note that this narrative contributes to the progressive trajectory of her occupational history which was highlighted earlier. By reasserting this positive emphasis, she is also reasserting her uniqueness as a woman in engineering. She is dually positioned. She narrates this story from an emic (inside) point of view while still acknowledging that her outsider status as a woman provides—and will always provide— an etic perspective. An example of this perspective is her comment about how her naiveté could have sabotaged her success. In their study of women in academia,

Aisenberg and Harrington (1988) found that women in their study frequently failed to recognize the importance of academic politics:

Clearly we were seeing a lack of knowledge about politics, i.e., the rules of the game, as well as lack of skill, but in many cases the lack of knowledge was coupled with something like a refusal to know, a shunning of political issues. In other words, women call themselves "naïve" and they mean that they did not…know how to play the academic game, but they also mean that they rejected…the idea that playing games to advance themselves is necessary. They believed…that people advance in the academic profession primarily through merit. And by merit they mean true merit that includes quality of mind and moral commitment as well as performance in writing and teaching. (p. 52)

Karan does learn the importance of politics. Merit plays an important part in Karan's assessment of her academic achievement as well. Conscious of how her outsider status may have been the reason she received such support and mentoring, she asserts that she achieved tenure because she was capable and demonstrated her abilities in the requisite areas. She also recognized, that because of her contributions she was a valuable asset to the college, and on that merit alone, any imbalances in her tenure package were disregarded.

Karan's status as solely a faculty member changes quickly after tenure. A year after she became an associate professor, they offered her the position of Assistant Dean over undergraduate and special programs, the first woman to hold a dean's position in the engineering program's 120-year history. It was also the first time an associate professor filled that slot. Karan commented, "there is no way that would have happened for the average white man." Her mentor that helped her get tenure advised her against taking the position, saying it would jeopardize her promotion to full professor by forcing her to put her research at a lower priority. However, she is committed to doing what she feels is important, so she accepted the job. After five years in that position her title changed to Associate Dean and the oversight of undergraduate programs was added to her responsibilities. Throughout this stage of her career mentors guide her through the

political and academic maze, and she is promoted to full professor. Her rise in the engineering college's administrative structure paralleled the increasing interest in recruiting and retaining women and minorities, which became one of her priorities. It also coincided in the resurgence of educational reform efforts, which the Foundation Coalition exemplified. One of her mentors was Carl Erdman, the Associate Dean of Academic Programs, who had led the Coalition effort from its inception, and it is through his friendship that her interest in becoming involved in the reform effort is kindled.

A&M and the Foundation Coalition

The Foundation Coalition was clearly a program that was aligned with Karan's personal and professional commitments. In 1993, the new FC grant fell under Karan's purview as Associate Dean for Undergraduate and Special Programs. She was an early advocate for augmenting the curricular innovation efforts by bringing more active and cooperative learning techniques into the classroom, believing that these techniques would support women and minority retention in engineering.

As Karan's mentor and as an associate dean himself, Carl Erdman understood the demands of Karan's position, and counseled her not to get too involved with the activities of the FC. But members of the other campus teams requested Karan's participation, and eventually she joined the national management team as Chief Financial Officer. As CFO she managed the Coalitions purse strings and held primary accountability to NSF. She had several roles in addition to this official one: she was the self-proclaimed "conscience" for two FC goals, institutionalization of the new programs and improving female and minority retention. When Carl died suddenly, in 1994, she stepped in as interim director for several months until a new project director was chosen. As the goals of the Coalition changed, so did the structure of the management team. Throughout the changes she maintained a steadfast and consistent influence over the direction of the program nationally, and especially at A&M in her role as Associate Dean.

Karan's reputation for excellence in teaching contributed to her ability to influence the direction of the program. By the time of her involvement, her vita listed over a dozen awards for teaching excellence and for her work in recruitment and retention of women and minorities in engineering. This reputation helped her overcome the handicap of being an administrator, a status often viewed by faculty with distrust.

She perceived another advantage that strengthened her leadership capabilities within the FC at Texas A&M—she was physically located on the right side of what she termed the "geographical divide." Her office was in a building centrally located within the engineering complex of several buildings on the campus. This office, officially called the Engineering Academic Programs Office, is also the college administrative unit whose sole mission is supporting the undergraduate and special programs, and therefore the one administrative office most students ever come in contact with. It is both physically, functionally, and symbolically the center of the academic arm of the college. In contrast, the Engineering Programs Office, which houses the office of the dean and other associate and assistant deans, is in another building altogether. While she had many opportunities and offers from the Dean to move over with the other deans, she declined, knowing that her physical location helped faculty and students disassociate her from what she knew others to call the "dark side," ultimately giving her more freedom and respect. Her physical location mirrored her commitment to teaching and learning and eased her transition to being an insider in the educational reform effort.

Karan was a significant contributor to the FC effort, both nationally and at A&M. Related to her role as change agent, there are three particularly significant areas in which she contributed. First, she consistently pushed for institutionalizing changes that would benefit all students, not just a percentage, even if it meant compromising on some innovations. She was a realist, and worked toward attaining a curriculum that could be accepted by all, moving the focus away from the content of the curriculum to the process of institutionalization. Secondly, she promoted the view that teaching should be seen as a scholarly activity, and encouraged faculty to find ways of rigorously documenting their work in educational reform. By doing so, she addressed the perception that the

promotion system was a barrier to change by not sufficiently rewarding faculty work in improving teaching and educational reform. Lastly, she helped to develop an understanding of the organizational change process and worked with the FC leadership as they made institutional change a priority in the second half of the grant period.   These contributions will be discussed separately in the following sections.

Institutionalization

Karan took very seriously her charge as the director of strategy for institutionalizing the new curricula. She consistently represented the Coalition's work in curricular change as "institutional change, not the perfect educational experiment." Therefore it should apply to all students in the college, not a percentage, as it did at several FC institutions. Karan said "on this campus it wouldn't be ethical for us to even discuss *if* we're going to adopt this. The question would be, what can we afford to adopt?…we can't take this kind of money from NSF and, even remotely, discuss *if* we're going to adopt this." Accepting the NSF grant represented a moral commitment.

This focus, that change should benefit all students, reflects a moral purpose and the foundational belief that education is a moral enterprise. Fullan (2005) argues that moral purpose is an underlying force in driving change. It is also, as we have seen an underlying force in Karan's personal and professional life. Moral purpose also informs the idea that change is ongoing. Adoption of new teaching techniques or institutionalizing new curricula did not mean that the change process was over. Eventually, Karan envisioned change and institutionalization as one, dynamic, reiterative process.

> You would have to figure out
> what you could afford to do…
> but the goal was 100% of the students.
> It was never 40 or 20 or 40% even.
> It was 100%.
>
> And so I started trying to work hard
> on what that would mean.

Occasionally that meant that the team
that was doing the innovations,
that were actually in the classroom doing it
felt like I was giving up too much,
pushing them to get it institutionalized,
because they had designed something
that was beautiful.

And I was giving up pieces of it,
because from my perspective,
we were going to end up with nothing
or something for a very few number of students
if we had to be too pure on it.

And I think it would have been better
if we could have adopted their things lock, stock, and barrel.
But I just don't think we were going to do that…

But I think I felt like I kept it balanced
and that we ended up making progress,
and I think we continue to make progress.
I don't think we're done yet.

And I think every time flurries come up about...
        "this isn't right yet,"
then I feel good about that
because it's never going to be absolutely right.

Karan's unique contribution to the FC effort was her ability to see the larger picture—see beyond the beautiful and innovative curricular product to the people who would be its implementers. Faculty needs had to be considered in order to ensure all students would benefit; and if that required compromising on some pieces of the product, Karan believed it was an appropriate tradeoff. She was committed to on-going change and realized that curricula are not static products housed in textbooks and teaching materials; they are dynamic, organic entities that must respond to changes in disciplinary values, societal trends and needs, teaching contexts, students and instructors. She acted as a mediator between what some saw as opposing camps in the debate over curricular reform, insisting that what institutionalization represented was not the end of

tradition and the beginning of reform, but the installation of a culture of change, a continuing commitment to improving engineering education for all students.

Educational Reform and the Reward System

In Chapter III, I described how the counter-narrative of reform presented the promotion system as a barrier to educational change. Karan would not engage in the conversation about whether or not the promotion criteria impeded change. She approached the issue by reasserting the context of A&M as a Research I institution whose research mission is clear and immutable. Faculty had the freedom to choose their career path and align it according to their personal values. She recognized that both intrinsic and extrinsic motivators were at play when faculty made choices about advancing up the academic ladder; but when it came to teaching, again because of its associated moral purpose, creating a better learning environment was its own reward:

> My expectation of why you would try
> to make a better learning environment
> is because
> the learners would have a better learning environment.
> And that's what's exciting to me.
>
> It's incredibly satisfying to me
> when you see a kid
> who just can't get this concept that you're talking about
> and thinks that it's magic.
> And when you can work with them
> or they can work with peers or whatever it takes,
> then they go
>   "Boom! I can do this,"
>
> Cause I remember those experiences in my life…
> You're like
>   "Oh, this isn't as hard as I thought it was.
>   I don't know why I thought it was hard."
> …that to me is the reward.
>
> That to me,
> when I get to share with colleagues

> "This worked, you might want to try it,"
> that's rewarding to me,
> when I share with them and they share with me.

Karan believed that faculty were misguided in their assertion that they should be rewarded for their work in the FC. In many cases, FC leaders and faculty who developed and implemented the new curricula had put their research programs on hold in order to devote their energies to the reform effort. This slowed their momentum towards promotion to full professor. Because of the size of the program at A&M, there was a large cohort of FC faculty who saw that even though they were presenting papers at educational conferences, this work was not seen as equally valuable as their technical research. These activities were also was not leading to publications in peer-review journals, a critical measure used for promotion. A clamor arose for recognition of their work. Karan was then forced to view the situation from two perspectives, as an insider in the FC, and as spokesperson for the administration. This dual stance is seen in her use of the pronoun "us" in the following narrative:

> For us, that's become a question of,
>   "Will this count?"
> The question we've had to seriously ask
> the colleagues who have been deeply engaged in this is,
>   "What did you want it to count for?"
>
> Because if you want it to count for service,
> then it definitely counts.
> But remember, service doesn't count a whole lot.
>
> And if you want it to count for teaching,
> then it definitely counts.
> But teaching is not going to win the day.
> It needs to be there,
> and it's getting where it has to be there stronger and more evidently.
>
> If you wanted it to count for,
> or instead of, research,
> then it has to be phenomenal in its impact.

Karan formulated how work in educational reform could lead to full professorship. The work had to focus on educational research, and it had to demonstrate leadership in the field. The difficult part of this formulation, however, was that there were no existing measures in engineering education related to improving the learning environment that were currently being used as criteria for promotion. Karan said,

> When all you're doing is changing the classroom environment,
> then you have to invent your own measures.
> That does make it harder,
> because you have to come up with
> a measure to prove it,
> or you have to make it into research
> and use those same measures
> that everybody else is using,
> which are publications,
> and did you go get grants yourself…
>
> Now if you don't want it to be about your research in education,
> I'm fine with that, too,
> I'm just saying…
> then you've really got to help us with the metrics.
>
> So I'm not saying it's not harder,
> I'm just saying the culture
> is not about rewarding research versus teaching
> as much as it's about rewarding leadership.

Karan actively worked with faculty to help them reframe the issue of reward for work in educational reform. As we have seen in previous chapters, some faculty saw the issue as part of the debate between the master narrative of the academy and the counter-narrative of reform. Some felt penalized for working in curricular change and teaching improvement. Karan encouraged faculty to view key promotional criteria as simply demonstrating leadership, no matter in what arena that leadership occurred.

Organizational Change

Karan was one of the earliest of the FC leaders to see that the process of organizational change was contextual; the strategies that might work at A&M would not necessarily be applicable to the other FC campuses. Over the course of the grant, Karan authored a realist narrative that viewed organizational change as a contextual process that must reflect and acknowledge faculty commitment to student learning. She spoke about this in her interview for the change study:

> I think that you have to understand what you want to accomplish
> In the context of what you have,
> And I think that is very specific to the campus.
>
> I had a lot of debates with the national team
> Because we would state stuff like,
>   "We were going to infuse these things into the curriculum"
> and I thought,
>   "This is going to do nothing but insult our guys,
>   Because they're already doing it."
> They already care about the learning.
>
> You can't act like faculty
> don't care about the learning.
> In their own way, they all do.
>
> You can't start out
> with such a passion for the change
> that you insult everybody
> by implying that they haven't heard any of this before.
>
> You have to be bold and delicate,
> simultaneously.
>
> What I saw was that if you're too delicate
> in not saying what you mean,
> nobody really knows what you are trying to change.
> If you're too bold,
> then you end up with insulted and lost people
> who don't understand
> what you've accused them of,
> or why, or whatever.

You have to be delicate enough
and observant enough
to understand what they are doing,
and be specific on what you hope they do,
or find would be valuable to do differently.

In our program, it's very clear to me
that if I focus on
    "We want the students to learn the material better,"
I can engage anybody in a discussion
about how we're going to accomplish that...

If I focus on other issues,
which they may or may not find as important,
like the teaching of women–
some find that very important, some don't–
but I don't have a faculty here
that doesn't think it's important
for the students to learn what we're presenting,
and we can engage them and discuss it.

Once we get past…
the lamenting of what's wrong with the students,
we can get on with the,
    "O.K., but what environment can we create."
We can convince a lot of people to do a lot of things.

I think finding and staying focused
on the right questions is really, really important for us.
I think we stayed focused on that,
with the commitment that we believed
we had some strategies
that we're going to work from.

We found out a lot of information about it,
so we were prepared
when they asked questions
about how we were going
to make for a better learning environment
to bring those strategies into play.
…But not because it was the only strategy.

In this narrative, Karan addresses the implicit assumption that faculty, in general, don't care much about teaching and are not concerned about student learning. This assumption is embedded throughout the debate between the master and counter-narrative as described in Chapter 3, and often implied in documents advocating reform. Karan, on the other hand, positioned herself outside the debate, and declared that all faculty, to a greater or lesser degree, were indeed committed to student learning, specifically content material. She believed that the argument for change would be sufficiently compelling to faculty if it was focused on improved student learning. She was also certain that it was unnecessary for faculty to adopt all of the innovations promoted by the FC in order to accomplish that goal. Engineers always make tradeoffs in their designs. Karan viewed curricular reform from the perspective of her profession and she believed there would also be tradeoffs in curricular reform. In her role as associate dean, it was her job to negotiate those tradeoffs, with department heads, with colleges outside engineering, and with faculty within her own college. She authored a realist narrative that viewed the process of organizational change and the FC story solely focused on creating the right learning environments for students based on the context:

> For me personally
> the story of the FC is to recognize that teaching
> is solely about creating the right situations and environment for learners.
> And that's all there is to it…
>
> I don't mean catering to,
> I don't mean making it easy,
> I just mean really creating the learning environment…
>
> …What I would have hoped for
> is that [the FC] opened people's eyes and ideas to the fact that
> there is not one right way to do this.
>
> But there are always trade-offs
> in trying to figure out how much energy you can give it
> and how effective it will be,
> and that's what is fun to explore.
> That's what I would hope people learned in the process…

…But instead of opening people's eyes,
they start looking at you as
   "Oh, you think *this* is the way instead of *this*."
And so, then it becomes this debate
about was it this or that…

…What we're trying to do is get people on the path
to a variety of approaches
and quit focusing on what we want to cover
and focus on what are they learning and stuff like that.

The story is the differences.
What you need to focus on with this group of students at [this school]
may not be at all what *we* need to focus on,
the fact that you focused on *your* students
and we focused on *our* students,
that's the story to me.

   In this narrative, organizational change is represented by the metaphor of getting people "on the path;" it is about providing options and additional perspectives for faculty to view their teaching. Karan viewed organizational change as a process dually focused on improving the learning environment while also addressing faculty needs and priorities, a process focused on changing people, not just curricular organizational structures.

Conclusion

   From a life history point of view, Karan's story is remarkably coherent. The dominant themes—being an outsider and unique, the influence of elders and mentors, and her moral development—create this coherence as they are woven throughout her stories and by their parallel development. By the end of her story they are no longer distinct. They are integrated, just as Karan's vision of who she's becoming is integrated as well:

So my vision of what I...*am wanting* to become is,
I don't know if it's Jungian
or how you could describe it,
I want to be well-integrated
in all aspects of myself.

I don't want to have
      "Well here's my spiritual life
      and here's my work life
      and here's my family life."
I don't want everything to be separated and isolated.
I want it to be well-integrated,
because, to me,
that's when somebody can be wise.

And in some of my family history and stuff,
especially with the Cherokee background,
to become an elder
is not about your age.
It's about…have you become…
somebody that people should…listen to
because you're able to listen to what they're talking about
and give them an integrated perspective back
that you recognize is neither—
not necessarily right or wrong,
but a perspective that should be valued.
That's what I want to be.

This vision encapsulates the unification of the three themes in Karan's occupational story. We can distinguish how this integration occurred as we re-visit and summarize her story.

She begins her tale as a young woman at ease with change and unencumbered by the need to control her circumstances. As she becomes more aware and sure of what matters to her, she begins to make choices about her career path, often guided by mentors. She then asserts more control over the direction of her life. Karan's unique abilities and achievements catapulted her into a leadership position very early in her career. Knowing that her uniqueness and outsider status worked in her behalf, she proactively used that aspect of her identity and perspective from the margins to do her

work more effectively. She saw that an outsider or insider identity could be a position assumed intentionally, but she preferred to allow that positionality to inform her as a way of knowing. By viewing insider/outsider, or emic/etic distinctions as epistemological concepts (Lett, 1990), we can see how Karan has acquired knowledge of the insider perceptions of both the master and counter narratives of the academy, while at the same time possessing the etic/outsider knowledge that allowed for independent and objective thinking. This provided freedom from the powerful norms entrenched in both dominant narratives and afforded her the freedom and power to choose. She could both empathize with the passionate commitment FC faculty had to their innovations, while being able to apply her knowledge and understanding of the change process. Her ability to position herself as either outsider or insider allowed her to take different perspectives, and help others do the same.

Karan held a global view of the FC effort from the very beginning. She encouraged faculty to reframe the curricular reform effort from adopting the perfect curriculum to improving the learning environment for students and focusing on ongoing change. In this way she acted towards reversing the fruitless and harmful polarization created by the debate between the master narrative of the academy and the counter-narrative of reform.

As Dean of Faculties, Karan remains in a position of change leader. She is still committed to improving the learning environment for all students, but in this position she accomplishes this through a focus of increasing faculty vitality and success in their professional lives. Her work continues to be informed by a strong sense of moral purpose, the overriding principle of why her work is important, why it matters. She is in a position to affect change. Karan remains guided by a vision of what she wants to become; an integrated vision of what it means to be an elder, of the attainment of wisdom.

CHAPTER VIII

CONCLUSION:

NAVIGATING THE TENSION BETWEEN THE MASTER AND

COUNTER-NARRATIVE — IMPLICATIONS FOR

FACULTY DEVELOPMENT

> When, for whatever reason, our own experiences do not match the master narratives with which we are familiar, or we come to question the foundations of those dominant tales, we are confronted with a challenge. How can we make sense of ourselves, and our lives, if the shape of our life story looks deviant compared to the regular lines of the dominant stories? The challenge then becomes one of finding meaning outside of the emplotments which are ordinarily available. We become aware of new possibilities. (Andrews 2002, p. 1)

This study describes how three engineering faculty members and one associate dean in engineering negotiated the challenges presented to them when values and norms embraced by the reform effort for which they worked, conflicted with those reflected in the dominant academic narrative. They made meaning from their work in reform in the stories that comprised their occupational life history. As Andrews suggests, personal dissonance with the master narrative can create change.

The master narrative concept aids in understanding the normative power of organizational cultures. Change agents, both inside and outside higher education, are just beginning to understand how organizational culture must be considered when designing strategies for change. This dissertation supports recent research that suggests change strategies must be congruent with or address values and norms of educational institutions (Tierney 1988; Bergquist 1992; Kezar 2001; Kezar and Eckel 2002; Godfrey 2003). The many factors contributing to—as well as fighting against—the relative success of the reform movement in engineering education testifies to the tremendous complexity inherent in attempting change. The personal narratives captured in this study

reflect this complexity. They provide four examples of how educational change attempted on an institutional scale is experienced and made sense of on the personal level.

For all my participants, the values, norms of behavior and beliefs about higher education were internalized through socialization in graduate school and during their early faculty careers. In this dissertation, these cultural attributes of the academy were conceptualized as a master narrative. In this way, culture is seen as a discursive process interacting with counter-narratives that offer the "new possibilities" to which Andrews (2002) refers. Master narratives provide people a source for knowing how to behave and what to value (Mishler 1995; Farrell, Kamler et al. 2000; Andrews 2002). Master narratives maintain tacit assumptions that uphold power structures and processes of oppression and submission. The reform effort of the NSF Engineering Education Coalitions of which the Foundation Coalition was a part, created a counter-narrative by calling for a "culture change" in engineering education. The counter-narrative challenged faculty complicity with the master narrative and offered alternative ways of viewing their role as faculty in higher education. In Chapter III, I described five areas where the counter-narrative challenged the master narrative of the academy: the rationale and need for educational change, the nature of faculty work; the relationships between the disciplines, the relationships among faculty, and the incentive and reward system.

The counter-narrative of reform promoted curricular and pedagogical change, claiming that the traditional manner of educating future engineers was no longer adequate. The master narrative, being a force for preserving the status quo and tradition, provided the rationale for faculty to resist change, reinforcing the belief that educational reform was not needed, and could actually be detrimental to student learning. The master and counter-narratives clashed over the nature of faculty work in research universities, fueling the ongoing debate about the relative value of research and teaching and associated value structure. The dominant master narrative supported maintaining the traditional separation between the disciplines, advocating ever narrowing areas of expertise in engineering. In contrast, the more generalist view of the counter-narrative

advocated more interdisciplinary and integrated foundations of engineering. And finally, the counter-narrative challenged the traditional independence of faculty, encouraging partnerships and community over the isolation and autonomy faculty currently experience and maintain. The areas of conflict between the two narratives are depicted in Figure 3 below.
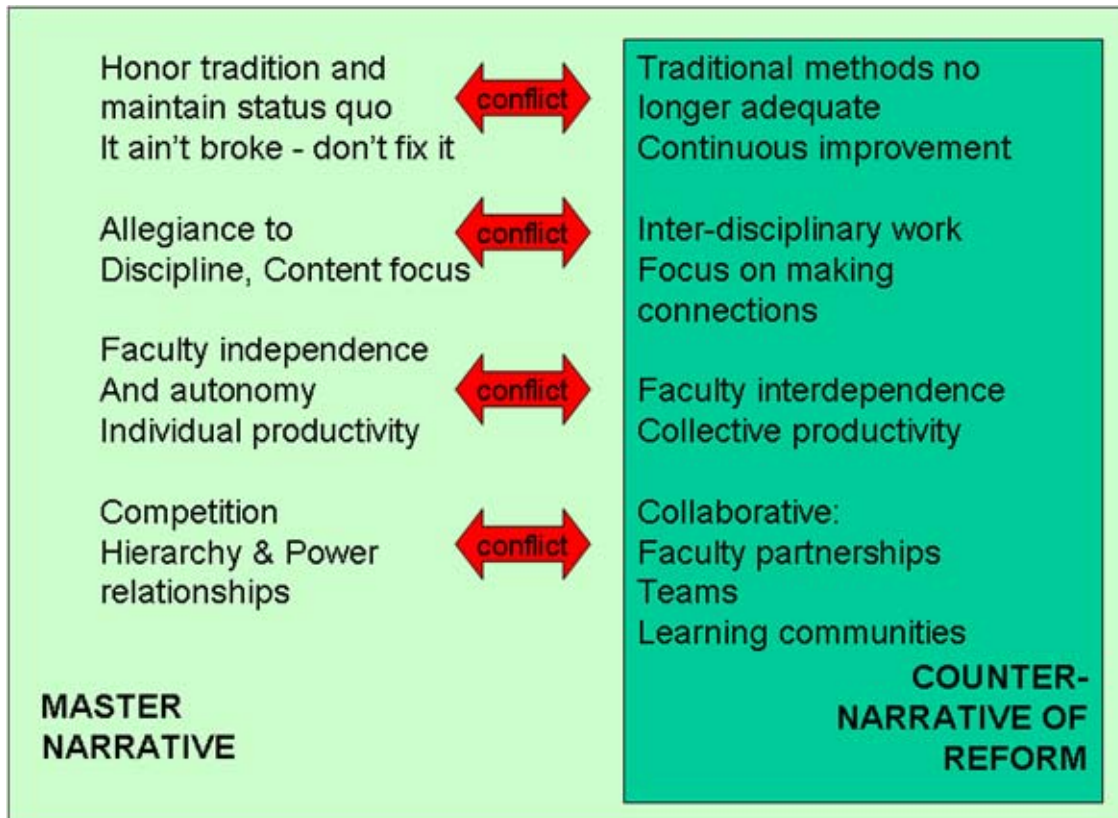

Figure 3: Areas of Conflict between Master Narrative and Counter-Narrative

Participant Summaries

Within the context of the history of engineering education, the life histories fall in a recent period in which the academic master narrative was being challenged. I discerned these two social narratives engaged in a debate over engineering education. Metaphor analysis indicated how these two narratives were given a voice in the stories told by faculty about their experience in the FC.

The participants in this study followed typical developmental paths in their academic careers. They were socialized as graduate students and new faculty, they established professional and social networks, achieved competence and expertise in their fields, gained respect from their colleagues, and learned how to play the academic game with regards to promotion and tenure. A common point of departure from the typical academic career was their involvement in the engineering education reform effort of the Foundation Coalition. Their involvement in the FC placed them at the intersection of the master narrative of the academy and the counter-narrative of reform and they wrestled with the value conflicts that intersection created. Each of the four people I studied had different ways of understanding and navigating these two narratives.

Louis

Louis is an idealist. He had a vision for a better teaching environment, a vision that assumed different forms as he matured and developed professionally. Louis consistently framed the stories in his occupational history in relation, and often in resistance, to the dominant academic narrative. He entered academia as a "rebel" and a self-proclaimed anarchist keenly aware of power hierarchies in the university. He then realized that the rebel stance would not lead to personal success, so he changed his strategy and chose to become "a member of the system" so he could "change it from the inside." His story of graduate school contained the most striking rendition of academic acculturation of this group, described in language that reflected intense pressure to conform to the master narrative. After several years of conforming and playing the academic game to achieve tenure, the opportunity arrived when he could realize his

vision with the curricular reform efforts in the work that preceded the FC, as well as in the FC itself. He learned, however, that merely operating as a "hired gun" in a project for which he felt no ownership was much less rewarding than believing deeply in the principles and goals of the work. Louis was driven to do work that was significant; he needed to have "the fire in the belly" about what he was doing. Becoming a "believer" transformed his experience as a teacher, and his vision became influenced by the ideals offered through the FC and the counter-narrative of reform. His intention to leave a legacy and pursue his vision of better way of educating engineers became a major element of his professional identity.

Ultimately, the level of commitment or passion, the number of teaching awards, or the generous overhead created through his administrative work overseas was not sufficient to warrant acknowledgement by his department through promotion to full professorship at Texas A&M. Louis was aware that his packet did not show enough evidence of technical research and grantsmanship and he did not really expect promotion. But as an idealist, he did expect some feedback from his peers that recognized his work as valuable. The unanimous negative response left Louis feeling unacknowledged, hurt and betrayed by his colleagues. He decided he could no longer work for A&M, and left to go back to his "roots" at UTEP, where there was a new innovative freshman curriculum, a student body with special needs and a locale where his interest in manufacturing research would make a significant contribution.

Louis idealist strategies were based on his resistance to the master narrative. He worked against the academic norm in order to achieve something better. Whenever his efforts seemed thwarted, he sought another place where his ideal could be realized.

Jim

Jim is a seeker. As the son of a professor, Jim was influenced by his father's lifestyle as an academic, which appeared to Jim as happy and relaxed. He sought the same lifestyle for himself. But his experience as a college student was disillusioning. As a learner, he was frustrated by the competitive atmosphere and the large lecture

classes. He sought meaningful relationships with faculty, but found only a few professors who offered guidance or personal attention. He drifted from discipline to discipline to find an area to which he could commit, finally choosing civil engineering. The PhD was his ticket to teaching. At the University of Alabama, the goals of the Foundation Coalition were a powerful lure for Jim; he saw in them an opportunity to improve the experience for students beyond what he had known. He enthusiastically embraced the FC agenda and doggedly advocated for curricular change in his college.

Jim was inspired by his experience of teaching in the FC curriculum; it felt good, and he could see it made a difference in student learning and enthusiasm. In the FC, Jim found other faculty who shared an interest and commitment to teaching and student learning. This collegial environment was crucial to his development and enabled Jim to grow and discover his own leadership capabilities. His enthusiasm was sustained through the energy created in faculty teamwork, workshops, and summer conferences. The appeal the FC held for Jim lay in the opportunity to create a better experience for students than the one he had. His belief in the FC curricula on his campus led him to be its most vocal advocate. His self-confidence and leadership abilities grew.

The dissonance between the counter-narrative and the master narrative was extremely uncomfortable for Jim. His engagement with the counter-narrative of reform brought the goals of higher education and actual teaching practice into sharp relief. He could not understand why his colleagues resisted the opportunity to improve their teaching. He ascribed their disinterest in helping students learn or improving their teaching to blind allegiance to the values of the master narrative. His strategy for dealing with the tension between the master and counter-narratives was to continue to seek answers to the difficult questions that challenged those deep-rooted beliefs about the teaching role of faculty and behaviors towards students exhibited in his college. Jim's strategies sought creative ways to make reform work at the local level.

Don

Don is a pragmatist and an accommodator. Don framed his occupational life history within several local and social narratives, many of which called into question and changed his own beliefs and values. He was adept at recognizing the individual and institutional perspectives within which he worked. As a pragmatist, Don understood how these perspectives could influence the course of change, and even the course of individual lives. Don took his tenure denial at Ohio State personally, though the message it sent to him was not a confusing one – he knew his research was not up to the standards of a Research I university. He reconciled that major disturbance in his and his family's life by finding a job where his interest in teaching would be valued and his desire to contribute to the field of engineering education could be satisfied.

When asked to lead the effort to design and implement the FC sophomore program at Rose-Hulman, Don's strategy was to confront the faculty issues remaining from the previous freshman reform effort and address them directly in order to effect change. He led his faculty team, and eventually the entire Institute, through a process of collaborative decision-making, which resulted in a curriculum upon which all could agree and which could work in that context. The curriculum itself, however, was less ambitious than the original A&M sophomore design upon which it was based; for example, course integration was vertical (courses were sequenced in a particular way), not horizontal (content aligned across courses in the same semester). This type of integration did not require very much collaboration among faculty during the semester.

Tuned into people and social context, Don was able to discern and avoid the pitfalls of zealous advocacy of a reform narrative that ignored the cultural context. The dominant institutional narrative at Rose demanded dialogue and participatory decision-making. By ensuring such dialogue, Don managed to devise a reform that accommodated the local master narrative.

Karan

Karan is a reframer. She used her ability to view issues and events from a global and holistic perspective to see more than one perspective. Karan rejected the dualism of master and reform narratives. She understood the master narrative as simply part of the context of a Research I university. For her, the change effort represented by the FC did not constitute a challenge to the master narrative, because she took the long view on change, seeing it as a core element of the educational mission, and an ongoing cyclical process. Curriculum for her was not a product but instead a dynamic process.

In addition, Karan saw the curricular changes and different teaching techniques, in their varied manifestations, as part of an on-going movement to improve the learning environment for students. It was congruent with the institutional missions of the schools in partnership in the FC, and certainly an appropriate role for faculty at A&M. Karan urged faculty to reframe their work in improving teaching and curricular reform by thinking of it as research. She saw that both the activities of teaching and research were objects of the process of learning—the search to understand and know. In the work of the FC, Karan introduced a new framework by which faculty—who were confused by conflicting values in the master and counter-narratives—could view their work in educational change. The FC story did not change Karan. Through reframing, Karan changed the story of the FC.

Discussion

The strategies used by these four individuals to make sense of their experience of the master and counter-narratives resulted in different outcomes. Their stories can also be seen within a widening sphere of influence in terms of effecting change.

Louis's idealism envisioned change on a grand scale, but the strategies he used to navigate the tension between the two dominant narratives focused on where his commitment and passion could be ignited. When barriers presented by the master narrative thwarted one effort, he found another opportunity. It appeared that UTEP, a teaching-focused university, could provide the chance to realize his vision, but again this

was prevented when he was asked to assume the chair of his department. Louis' story ends without resolution; he has not yet been able, on the practical level, to realize his vision, to effect change on a large scale, or to sustain his contribution on a personal level.

The FC provided a refuge in which Jim could dialogue about and experiment with different teaching methods. It was an incredibly stimulating experience for him, and once the FC ended, he was highly motivated to find and create similar kinds of relationships. Jim sought collaborative relationships; he did not want to experience the resistance presented by the master narrative alone. He knew he needed like-minded colleagues with whom he could generate the kinds of energetic and rewarding experiences he had in the faculty teams in the FC. Through advocating the values and aspirations of the counter-narrative, agitating from the margins, and engaging colleagues in dialogue, Jim continued to seek new and creative opportunities to create those relationships. This strategy worked for Jim; he learned he could not effect change alone.

As a pragmatist, Don saw that the institutional values and ways of doing things at Rose-Hulman had to be accommodated to effect change. His focus was always at the level of institutional culture—the local master narrative. Learning from the results of the previous reform, Don crafted strategies that ensured adoption of a new "consensus" curriculum. Consensus, however, meant compromise. His focus was always pragmatic, on what would work within the context. Accommodation, as a strategy, means adapting to the local dominant narrative, but in doing so, some principles on which the counter-narrative is based are lost.

Karan reframed the counter-narrative and thus the master narrative remained unchallenged. She took a global view of the effort to change engineering education. The process of reframing enabled her to address many of the issues that surfaced, in particular, the question of reward for faculty work in educational reform. To Karan, excellence in research was essentially about providing leadership and contributing to the knowledge base in various areas. To be acknowledged (and thus rewarded) for their work in educational reform, FC faculty needed to provide documentation and evidence

of their contribution. The challenge to engineering professors was how to accomplish that. Karan urged faculty to find ways of measuring and documenting their educational efforts. Engineering educators needed to learn how to perform education research. Karan was advocating they engage in the scholarship of teaching and learning. This was a means by which the shared values of the two narratives could come into focus, a possible way to reconcile the opposing forces faculty experience between their research and teaching roles.

Scholarship of Teaching and Learning (SoTL)

Ernest Boyer (1990) of the Carnegie Foundation for the Advancement of Teaching reconceptualized the faculty's role in teaching in his landmark book, *Scholarship Reconsidered.* He defined what it would mean to view teaching as a scholarly activity. The scholarship of teaching quickly became the topic of heated debate in academia, the dialogue creating two vital distinctions: scholarly teaching and the scholarship of teaching. Scholarly teaching begins with reflection on how students are learning and questions about what fosters and impedes that process. It requires documenting student learning and faculty teaching, identifying resources in the teaching and learning literature that assist in defining and addressing faculty questions, and applying what is learned from various resources and documenting the outcome.

NSF funding for educational reform in engineering education in the 1980's and 90's lead to changes in the engineering accreditation process by the Accreditation Board for Engineering and Technology (ABET). New criteria mandated engineering schools to set learning objectives and assessment measures for student learning and skill attainment in technical as well as interpersonal domains. These new criteria, called ABET 2000, virtually forced engineering schools to reframe their educational missions to be more congruent to principles underlying the scholarship of teaching and learning (Wankat, Felder, Smith & Oreovicz, 2002).

There are barriers to the complete acceptance to this new framework for the faculty role in teaching. Randy Bass identifies one area of difficulty that mirrors

reactions encountered by FC faculty when they advocated new curricula and teaching techniques:

> One telling measure of how differently teaching is regarded from traditional scholarship or research within the academy is what a difference it makes to have a "problem" in one versus the other. In scholarship and research, having a "problem" is at the heart of the investigative process; it is the compound of the generative questions around which all creative and productive activity revolves. But in one's teaching, a "problem" is something you don't want to have, and if you have one, you probably want to fix it. Asking a colleague about a *problem* in his or her research is an invitation; asking about a problem in one's teaching would probably seem like an accusation. Changing the status of the *problem* in teaching from terminal remediation to ongoing investigation is precisely what the movement for a scholarship of teaching is all about. How might we make the problematization of teaching a matter of regular discourse? How might we think of teaching practice, and the evidence of student learning, as problems to be investigated, analyzed, represented and debated? (Bass 1999, p. 1, italics in the original)

The scholarship of teaching, however, takes that work to the next level to rigorous educational research: "public, peer-reviewed and critiqued, and exchanged with other members of our professional communities so they, in turn, can build on our work" (Shulman, 1993, p. 6). Viewing teaching in such a manner would mean conceiving teaching as "community property" and challenge faculty privacy and isolation in the classroom. It would also raise the standards by which teaching is evaluated and valued. Viewing teaching in this way, of course, raises implications for faculty development. A clue to how this kind of scholarship can be supported comes from a bird's eye view of the professional development model used within the Foundation Coalition.

Curriculum, though conceived as a set of courses and learning objectives, is ultimately a dynamic force experienced at the individual level by both faculty and students. The curricular changes attempted by the FC were based on a student- and learning-centered educational ethic that resulted in changes experienced at all levels of an engineering professor's life. Faculty behavior, daily routine, knowledge and

pedagogical skills, relationships with other faculty, students and ideas, and curricular content all changed. Curricular change meant personal change. How could this be sustained over time?

We saw in the FC that initially, once faculty members committed themselves to this new educational ethic and received the training and support required to present the curriculum, they did so in a collaborative learning environment consisting of like-minded individuals from both their own campuses and from other FC institutions. In effect, these groups and teams were learning communities engaged in the process of constructing knowledge about learning and teaching.

Ultimately, the organizational structures and release time enabled through NSF funding that sustained these communities ended. While the shell of the curriculum and in some cases a maintenance structure of some kind was still in place, the formal teams eroded as individual faculty resumed their pre-FC academic lives. There was no formal structure to sustain the change and on-going learning. This was a similar issue plaguing faculty developers, whose traditional professional development model consisted of workshops or consultations that limited interaction over a short period of time. Based on the documented success of student learning communities (MacGregor, Tinto et al., 2000) faculty developers have implemented faculty learning communities (FLCs) as one avenue for creating and sustaining change over time (Cox, 2004).

Pioneered by the CCLE program (Creating a Collaborative Learning Environment) at the University of Wisconsin-Madison from 1993-95, the learning community approach provides a supportive, often inter-disciplinary, environment in which faculty can explore teaching and learning perspectives from each other and from research (Sanders, Carlson-Drakes et al. 1997). The key to its effectiveness lies in the notion of community and its efficacy in addressing the traditional isolation and insulation of faculty as they enact their teaching role. In interviews collected for the FC change study, many FC faculty credited working as a member of faculty teams with a shared goal, participating in professional development activities as a group, and team-teaching to be the most valuable in contributing to their learning and growth.

If other FLCs at universities around the country reflect the current experience at A&M (Layne, Froyd et al., 2002), they are infused with engineering and engineering science faculty who are drawn to recreate and sustain their experience of community experienced through their participation in the Engineering Education Coalitions. The experience of the FC and the current FLC programs occurring around the country support the efficacy of learning communities as a means to effect and sustain change.

Recommendations for Further Research

More research needs to occur related to the work of the Engineering Education Coalitions. Having attempted, and in some cases institutionalized curricular and pedagogical changes within the past 15 years or so, they provide an extraordinary opportunity, if undertaken soon, to examine issues of sustainability and maintenance of educational change. Addition interviews with the same participants from the FC change study, would provide longitudinal data to help understand how change is sustained with individuals over time. There are other research questions related to issues of faculty development that would be opportune to ask at this time, e.g., how has their participation in the FC altered their teaching? How has their self-identity or professional goals changed? And finally, the hundreds of professors and instructors who participated in curricular reform projects form a pool of people whose personal stories could contribute to our understanding of how to effect educational change.

Conclusion

The interplay of personal stories and social narratives helped me to see how and when personal change within organizational change efforts occurred. It also reinforced the importance of taking into account context as a mitigating factor in any change effort. While the academic culture, and in particular, a promotion and tenure system that values research over teaching, are often blamed for why higher education does not change, my study shows it is not that simple. Attaining the goal of "altering the culture of engineering education" may not have been met, but innovations were adopted, courses

and curricula were redesigned and most importantly, professors and administrators, like the individuals profiled in this work, had opportunities to "re-narrate" themselves as engineering educators and agents of change in higher education.

Faculty stories are the medium through which we can comprehend the power of master narratives. Stories illuminate, reproduce and challenge cultural norms by forming counter narratives. They address issues of power and hegemony. They construct and enact new possibilities.

The Foundation Coalition brought together people from many institutions to form a shared consciousness about the possibility of reform in higher education. If I have captured the personal "truth" of the participants in this study—their collective story should resonate with others involved in similar projects. It is my hope that reading how others have re-narrated or re-plotted their academic lives in order to promote a narrative of reform in engineering education will help others do the same.

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