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HOW COMMUNICATION AND SENSEMAKING IN AN ACADEMIC COMMUNITY OF PRACTICE AFFECTS INDIVIDUALS' PROFESSIONAL IDENTITIES

A Thesis in

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Lisa D. Weaver

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The thesis of Lisa D. Weaver was reviewed and approved* by the following:

Carol L. Colbeck
Associate Professor of Higher Education
Thesis Advisor
Chair of Committee

Peggy N. Van Meter
Associate Professor of Education

Lisa R. Lattuca
Assistant Professor of Higher Education

Renata S. Engel
Professor of Engineering Science and Mechanics

Roger L. Geiger
Professor of Education
In Charge of Graduate Programs in Higher Education

*Signatures are on file in the Graduate School

ABSTRACT

This dissertation explored how individual characteristics of members, communication patterns, relative power, and collective sensemaking about the concept of Teaching-as-Research in a community of practice influenced any changes in members' professional identities. Teaching-as-Research involves using methods similar to those used in research (hypothesizing, implementing, analyzing, and modifying) to develop and apply teaching strategies. The case study involved thirteen instructors of undergraduates in a science department at a research university participating in an academic community of practice.

Weick's theory of sensemaking (1993, 1995) provides the theoretical foundation for this study. Major concepts in the conceptual framework include individual characteristics, professional identity, community of practice, and sensemaking, both individual and collective. The study proposes relationships among these concepts, and explores how, over time, they interact to effect changes in the professional identities of individual instructors. The three research questions that are addressed include 1) How do the individual characteristics of participants in the community of practice, including rank, gender, ethnicity, experience and their professional identities affect communication within the community of practice; 2) How do characteristics of the community of practice, including norms, values, relative power of members, and the topics and types of communication, influence individual and collective sensemaking; and 3) How, if at all, are the professional identities of individual members modified by individual and collective sensemaking about a concept new to the community of practice?

Data collection involved interviews and observations. Initial interview questions focused on the individuals' personal characteristics, professional identities, and the characteristics of the group. Twelve sessions of the community of practice were observed, and during one of these sessions, members were introduced to the concept of Teaching-as-Research by an outside speaker. Final interviews elicited information about individuals' identity as a teacher, researcher, and integrated professional. Individuals were asked to define the term "Teaching-as-Research" during both interviews. In the final interviews, participants were also asked to discuss their opinions about how discussing the concept of Teaching-as-Research affected the community of practice as a whole.

Communication utterances were coded according to topic and type of communication as well as rank, gender, ethnicity, and experience. Data analysis involved construction of a profile for each participant, including their personal characteristics, perceptions of themselves as professionals, perceptions of the group process, and who they considered influential. Individual profiles also included summaries of communication patterns, including percent of contribution to total communication and percent of own communication by type and topic. Any changes in the participants' professional identities were ascertained from responses to identical questions during both the first and final interviews and then compared to observations of changes in their participation in the group over the duration of the study. Interviews were analyzed for individuals' perceptions about norms, values, communications, power, and sensemaking in the community of practice.

Findings from this study related individual characteristics to participation in the community of practice; nature of participation to relative power within the community of practice; nature of group communication to collective sensemaking; and sensemaking to self-reported changes in professional identity. First, instructors in the midst of their careers participated more actively than those who were at the beginning or near the end of their careers. Second, instructors who were at their highest academic rank participated more actively in the community of practice than those members who were emeritus faculty members or tenure-ineligible. Third, an individual in a community of practice who initiated and contributed new conversations more than other members informally set the agenda by influencing which topics were discussed within the group. Fourth, collective sensemaking was more likely to occur when members of the group believed they needed to make and justify a decision. Finally, even though no consensus emerged from collective sensemaking about Teaching-as-Research, introduction to, and discussion of the concept encouraged individual sensemaking about the topic which led to self-reported change in professional identity among a majority of participants. Those individuals who indicated they experienced some change in their professional identities because of conversations about Teaching-as-Research talked about the personal impact for them. Those who stated that the discussions about Teaching-as-Research had no effect on their professional identities did not talk about a connection between the concept and their teaching.

Based on these findings, the research discusses implications and future research. For administrators who are trying to get a group of faculty members to adapt the concept of Teaching-as-Research, opportunities should be provided for the group to engage in

collective sensemaking about the concept; e.g., the group should be encouraged to develop and commit to a plan of action that they can share explicitly and publicly.

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I dedicate this book to the strong and courageous women who have gone before me: Anna Ludwig, Peggy Woomer, Susan Petrusic, Shirley Hoffman, and Betty Fultz. They lived life to its fullest, faced many hardships in their lives, and taught me numerous lessons including how to be true to myself.

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Chapter 1

Introduction

Members of a science department at Woodland University[1], a major research university, slowly trickle into the room, talking with one another about various issues such as the weather, the current performance of the football team, and other topics unrelated to work. As the attendance in the room increases, the conversation begins to shift to the purpose of the group, discussing the teaching of science to undergraduates. On this day, Donna, a member of this informal group, is describing changes she made to a course, based on some student feedback.

> The change I made in (this course)[2] this semester was implementing a new assignment, and I have to credit one of our undergraduates with this idea. He was my TA (teaching assistant) over the summer for another course, and I was talking to him about this course, what he liked, what he didn't like, and what he would change to make it better for the students. And I think he's pretty objective because he likes science. I don't think he was just trying to complain about all the things that he thought should be changed, but he was really being objective about it. And he mentioned that one of the biggest struggles for him was writing up an experimental, and that the students don't get to do this at all in the lower level classes.

Donna continued to provide the group with details of the changes she made to the class. The information she had given her students to work with was actual data she received from a tenure-track research faculty member about his current research. She went to this

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[1] To ensure the confidentiality of the participants in this study, all names of individuals and the institution are pseudonyms.

[2] The title of the course has been omitted to maintain confidentiality of the department.

faculty member's graduate students and (with permission) copied their raw data from their lab notebooks. The students in her class were required to use this data, analyze it, and then write a report. As Donna continued to describe this particular assignment group members began trying to make sense of what she was saying. At one point, Kathy chimed in:

> I think the real kicker is that it's real data and that means so much more to them (the students) to know it's real, even if it's a lot of work. Whenever anything is a lot of work, as long as they know it's something that someone really does need to do when they get out, I think they don't complain, but when it, if they feel it's a canned assignment and it's a lot of work…

Donna was explaining how she made changes to a particular class based on feedback she had received with the goal of improving the course and the students' learning. The course revisions and the evaluation she used to determine the effects of her revisions provide an example of Teaching-as-Research. Teaching-as-Research involves deliberate, systematic, and reflective use of research methods to develop and implement teaching practices that advance student learning (CIRTL, 2003). Kathy's comment is an example of sensemaking. Kathy was trying to make meaning out of Donna's information by talking with others in the group about her understanding of the conversation. The group in which this conversation took place may also be referred to as a community of practice. A community of practice is a group of individuals who come together to share ideas and who are focused on a specific topic (Buysse, Sparkman, & Wesley, 2003).

This particular community of practice is focused on undergraduate science education in the sciences. The members are all in the same department within the College of Science at Woodland University. Their conversations vary from week to week, but

their mission is the improvement and enhancement of undergraduate education, including planning for the laboratory, upgrading the facilities, and curriculum issues. The group has sustained itself for over fourteen years without formal sanction from the department.

The study described in this dissertation explored how this community of practice, which focused on curriculum development and teaching of undergraduate science courses, made sense of the concept, Teaching-as-Research. The group was introduced to Teaching-as-Research early in fall semester, 2004 when two visitors spoke to the group about the concept of Teaching-as-Research. The first visitor described how her department at another university had accomplished curriculum changes over the past few years. Application of Teaching-as-Research was implicit in her presentation. The second visitor presented the definition and various applications of Teaching-as-Research. In this study, I explored how individual and collective sensemaking within a community of practice about Teaching-as-Research, affected individual instructors'[3] professional identities as teachers, researchers, and integrated professionals (instructors who purposefully combine their roles of teacher and researcher).

1.1 Background

Undergraduate education in the fields of science, technology, engineering, and mathematics (STEM) should be improved, according to organizations such as the

[3] The term instructor will be used throughout this proposal to refer to any individual who teaches undergraduates. I will use the term *tenured faculty* to refer to those individuals who have earned tenure, *tenure-track faculty* to refer to those who are on the tenure-track but have not yet earned tenure, and *tenure-ineligible faculty* to refer to those who are not on the tenure-track.

National Science Foundation (1996), and the National Research Council (1999, 2003). Whether methods used to teach the STEM disciplines alienate undergraduate students has been a subject of debate for more than 30 years (Browne & Blackburn, 1999). In a study by Seymour and Hewitt (1997) of undergraduate students at seven four-year institutions, eighty-three percent of the students who switched out of a science or mathematics major cited poor teaching by the faculty members as a factor contributing to their decision.

Coppola, Ege, and Lawton (1997) assert there is a strong need for undergraduate students to develop critical thinking skills that are both creative and complex. Students should be able to make the connection between the laboratory research and the classroom lecture or discussion (Browne & Blackburn, 1999).

When teaching an introductory science class, instructors often depend on their "near peers" as sources of knowledge about teaching and learning (Foertsch, Millar, Squire, & Gunter, 1997; Rogers, 1995). Not all instructors are at the same level of knowledge and expertise regarding teaching, so they may benefit from communication and peers' collaboration when preparing to teach.

At research universities where research productivity is valued more than teaching effectiveness however, the task of improving undergraduate education is particularly difficult to accomplish (National Research Council, 2003). While collaboration with colleagues is expected in research activities, faculty members are typically reluctant to collaborate regarding teaching. Recently, there have been efforts to bring groups of teachers together in communities of practice to discuss curriculum and teaching, but efforts in the sciences are lagging behind the other disciplines (National Research

Council). Communication helpful to improving undergraduate teaching in science and other STEM disciplines may occur within communities of practice.

A community of practice is a group of individuals who are pursuing learning focused on a specific topic (Buysse, et al., 2003). Educational communities of practice have developed to address such issues as teacher education, changes in departments, or curriculum issues. More recently, an additional concern addressed by educational communities of practice is how to integrate educational research and educational practice (Buysse, et al.). At the same time, funding agencies such as the National Science Foundation (NSF) are investing in higher education institutions to figure out how to connect the concepts used in research to teaching practices. One project funded by NSF, the Center for Integration of Research, Teaching and Learning (CIRTL), advocates "Teaching-as-Research." This concept calls for college and university instructors to approach their teaching in the same manner as they approach their research-- by hypothesizing, implementing, observing, analyzing, and improving the process (CIRTL, 2003). CIRTL also encourages faculty and future faculty in the STEM disciplines to provide support to each other as they implement teaching as research in communities of practice.

A community of practice creates an environment where individuals can learn and discuss new concepts and work collectively to derive meaning from these new ideas. This process of trying to understand a new idea may also be called sensemaking. Collective sensemaking is the process by which members of a group or organization structure meaning out of ambiguous circumstances (Kezar & Eckel, 2002; Weick, 1995).

Sensemaking is retrospective and occurs as people assign meaning to what has occurred or to something they have learned (Weick, 1993).

Many studies have explored how learning takes place in a community of practice (e.g., Hodkinson & Hodkinson, 2003; Lave & Wenger, 1991). While previous studies discuss the process of becoming a member of a community of practice and one's subsequent participation, the effect of the activity within the group on individuals' professional identities has been under-examined and overlooked (Hodkinson & Hodkinson). Professional identity development is a social learning process that includes acquiring the specific knowledge, skills, values, and attitudes required for professional roles (McGowen & Hart, 1990).

1.2 Purpose of the Study

This study explored how a group of instructors in a community of practice that focuses on curriculum development and teaching of Introductory Science courses for undergraduates made sense of the concept of Teaching-as-Research. Specifically, the study focused on how individual and collective sensemaking about Teaching-as-Research within the community of practice affected individual instructors' professional identities as teachers, researchers, and integrated professionals. The study addressed the following questions:

1. How do the individual characteristics of participants in the community of practice, including rank, gender, ethnicity, experience and their professional identities affect communication within the community of practice?

2. How do characteristics of the community of practice, including norms, values, relative power of members, and the topics and types of communication, influence individual and collective sensemaking?

3. How, if at all, are the professional identities of individual members modified by individual and collective sensemaking about a concept new to the community of practice?

1.3 Significance of the Study

Research on communities of practice related to teachers has historically ignored the effect that membership and the activities of the group have on participants' professional identities and concepts of self (Hodkinson & Hodkinson, 2003; Zeichner & Noffke, 1998). This study explored the effects of group membership and collective sensemaking about Teaching-as-Research on the professional identities of instructors at a research university. The results of the study provide insight into the process that occurs within a group of faculty as they try to make sense of Teaching-as-Research and other teaching and curriculum issues. The findings from this study add to the theoretical knowledge about how relative power of group members shapes the process of collective sensemaking about teaching and learning and consequently, individual motivation to engage in new teaching practices. Practical implications from this study include new information about how to improve the process of communication within professional communities of practice.

1.4 Dissertation Overview

This dissertation contains six chapters. Chapter 1 presents the concerns regarding undergraduate education in the STEM fields, the purpose of the study, and the significance of the study. Chapter 2 describes the theoretical foundations of the research, introduces the framework for the study, and defines the major concepts in the framework. Chapter 2 also proposes relationships between these concepts. Chapter 3 provides the research design for the study, including the sampling, data collection, coding rules, and approaches to data analysis. Chapter 4 focuses on the characterization of the group members and the individuals' perceptions of their professional identities. A detailed description of the twelve group sessions observed is also included in Chapter Four, along with a discussion of the topics and types of communication. Chapter 5 revisits the research questions and provides detailed information regarding the group interactions in regards to power, norms and values, and the collective sensemaking that occurred. Chapter 6 summarizes the findings of the study, discusses implications for practice and theory, addresses the limitations, and provides recommendations for future research.

Chapter 2

Conceptual Framework/Literature Review

In this chapter, I describe Weick's theory of sensemaking (1993, 1995) which provides the theoretical foundation of this research study. I then provide definitions and descriptions of the major concepts in the framework, including individual characteristics, professional identity, community of practice and sensemaking, both individual and collective. Finally, I propose relationships among these concepts, and explore how, over time, they may interact to effect changes in the professional identities of individual instructors.

2.1 Sensemaking

Sensemaking, as articulated by Karl Weick (1993, 1995), provides the theoretical foundation for this study. Weick asserts that because the world is complex, there are multiple ways to understand events. The process of sensemaking allows individuals to reduce many alternative, conflicting, or ambiguous interpretations to a manageable one or few (Weick, 1993). Individuals or groups look at events that have occurred and try to understand and justify their actions relative to those events. Weick's theory of sensemaking explains how individuals and groups actually process information, and contrasts with theories of rational decision making - the way many people think they are supposed to make decisions.

Rational decision-making is a process of selecting a particular course of action from a group of alternatives (Johnson & Johnson, 1994). This process involves five steps as depicted in Figure 2-**1**

1. identifying the problem that needs to be addressed
2. analyzing the problem
3. developing alternative solutions
4. evaluating the solutions
5. choosing a desirable course of action (Simon, 1993).

Rational decision making involves analyzing the alternative solutions, reviewing the costs and benefits, as well as the implications for the future before choosing a solution or action (Choo, 2002).

*Figure 2-**1**: Rational Decision Making*

In practice, most individuals have neither the capability nor the time for gathering and processing all necessary information, so they do not make their decisions in a rational manner (Choo, 2002; Daft, 1998). Rather, the process of making decisions often involves conflict, trial and error, and mistakes (Daft).

For individuals who need to make hundreds of decisions each week, the rational decision-making process can be overwhelming. Even simple individual choices about

what movie to see or whether or not to buy a new shirt can be daunting if one considers all possible alternatives, weighs probable outcomes of each, and resolves preference differences. Rational choices involve guesswork; guessing about uncertain consequences and uncertain preferences in the future (March, 1988). Rather than looking at each situation, analyzing it, and trying to make the optimal choice, people typically act first and then rationalize why they acted the way they did. They make sense of what has already occurred and justify past actions instead of going through the exhausting rational decision-making process (Weick, 1993).

Rational decision-making by groups or formal organizations can be even more complicated than individual decision-making. Conflicts, lack of information, ambiguous goals, or inadequate resources interfere with decision making in a purely rational manner. For example, there may be conflict if a group of individuals cannot agree on their end goals. Problems may occur if those making the decision do not have the information necessary to make an informed choice. If decision makers are unsure as to the nature of the exact issue or concern, they will also be uncertain about what end result to pursue. Finally, even when the goal is clear, there is group consensus regarding the desired action, and the information is available, adequate resources to accomplish the chosen task are also necessary (Daft, 1998).

2.1.1 Individual sensemaking

Every day, people try to make sense of what has happened and actions they have taken. Sensemaking is retrospective and occurs as people assign meaning to what has

occurred in the past in order to plan for the future (Weick, 1993). This process of looking backwards may be referred to as rolling hindsight (Pugh & Hickson, 1997). In justifying actions, people engage in a “continual weaving of sense from beliefs, from implicit assumptions, from tales from the past…” (Pugh & Hickson, p.111). Sensemaking is ongoing because the environment is continually changing, and individuals repeatedly rationalize what they just did in order to understand it. “Action leads the sensemaking process; it does not follow it ” (Weick, p.33).

Justifying one’s actions to another reinforces the interpretation, because the other becomes a witness. Individuals typically explain their actions in terms of the values and norms of the social groups they view as being important. For example, an instructor may explain to a colleague that she decided to use more group exercises in a class because students expressed interest in more collaborative work on their mid-semester evaluations. She uses this justification because her university and department leaders have been espousing the goal that their university should become more student-centered.

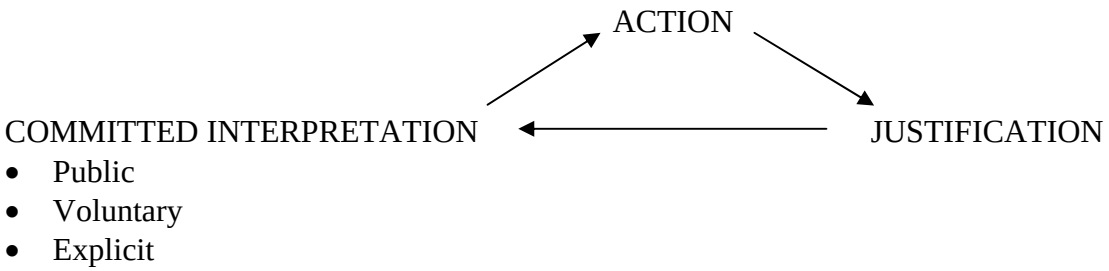
2.1.2 Collective sensemaking

Individual sensemaking becomes committed interpretation in a group or organization where individuals interact with one another. Weick (2001) views organizations as “collections of people trying to make sense of what is happening around them (p.5)”. An organization, then, may be as informal as a community of practice that meets consistently or as formal as a multi-million dollar organization. Weick (1993) states, “organizations are ideal sites for committed interpretation because they generate

action, champion accountability, make choices, value good reasons, and scrutinize everything (p.33)".

The concept of "committed interpretation," defined by Weick (1993, p.10) as "the use of binding social action to generate richer qualitative information that stabilizes a confusing flow of events", is central to collective sensemaking. Committed interpretation occurs when actions are voluntary, public and explicit (Weick, 1993). Sensemaking is an ongoing process as depicted in Figure 2-2.

Figure 2-2: Collective Sensemaking



Collective sensemaking is the process by which members of a group or organization structure meaning out of ambiguous circumstances (Kezar & Eckel, 2002; Weick, 1995). It is a reciprocal process whereby group members obtain information from each other, and give meaning to it. During the process of collective sensemaking, individuals invoke justifications with each other to provide understandable structure for what is occurring within the organization, especially situations that are ambiguous and unclear. Individuals justify actions with explanations likely to be plausible to and supported by the group with which the individual is interacting (Weick, 1993). As group

members collectively engage in sensemaking, they construct meaning, define the purpose of an organization and frame the problems and opportunities that need to be addressed (Choo, 2002).

Birnbaum (1988) asserts that sensemaking may be more prevalent than rational decision-making in colleges and universities. Higher education organizations are situated within multiple, complex, overlapping, and often competing environments. For example, state policies, alumni concerns, and various requirements from disciplinary associations affect the choices made by administrators and faculty. By taking a retrospective look at situations that have occurred and exploring what precipitated the event, institutional leaders justify decisions they made, and institutions move forward (Birnbaum).

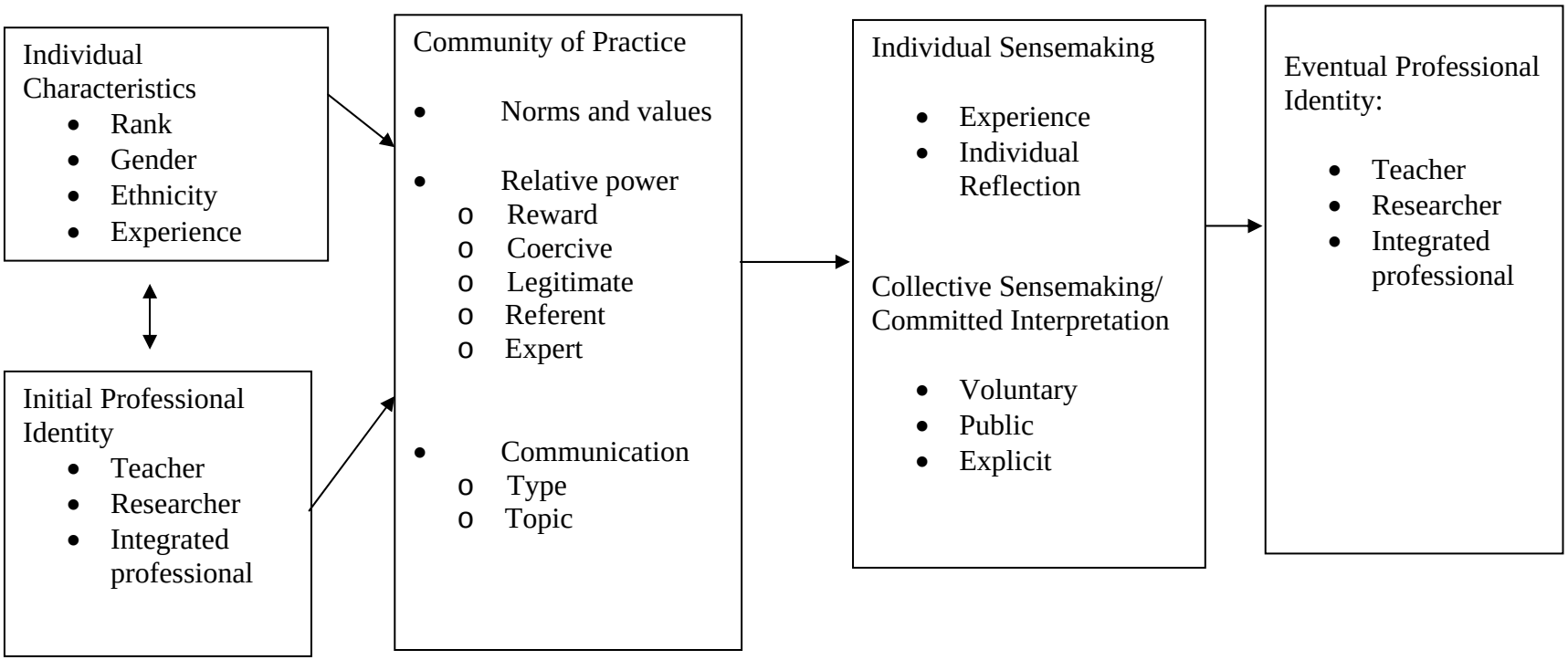
Collective sensemaking and its relationship to change within organizations have been studied at various higher education institutions (Gioia & Thomas, 1996; Kezar & Eckel, 2002). For example, Kezar and Eckel (2002) found that sensemaking allows people to understand and accept changes within an organization. In their study of management approaches leading to strategic change, Gioia and Thomas (1996) found that collective sensemaking about university identity and image was an important link between changes in the environment and management's perceptions of these changes. Examples of sensemaking serving as ongoing justification for action within the higher education community are evident in Burton Clark’s (1972) discussion of organizational sagas at distinctive colleges. At Antioch, Reed, and Swarthmore Colleges, strong collective perceptions of institutional culture helped the administration, faculty and students make sense of the past, justify current actions, and validate frameworks for future endeavors (Clark, 1972).

2.2 Major concepts

This study used sensemaking as the theoretical foundation to examine how participation in a community of practice influences change in individual participants' professional identities. The conceptual framework for this study is depicted in Figure **2-3** and suggests that the professional identities of individual instructors in an academic community of practice are influenced by individual characteristics, characteristics of the group, each member's individual sensemaking, and the group's collective sensemaking.

Individual characteristics of each member of the community of practice, such as rank, gender, ethnicity, experience, and their perceptions about themselves and their work roles are likely to affect interactions within the community of practice. Group characteristics such as norms and values, relative power of members, and the nature and topics of communication discussed may influence individual and collective sensemaking within the community of practice (Gioia & Thomas, 1996). Finally, individual and collective sensemaking may modify the professional identities of individual members of the community of practice.

Figure 2-3: The effects of sensemaking on an individual's professional identity



2.2.1 Individual Characteristics

In this section, I discuss individuals' characteristics and professional identities that may affect the functioning of a group such as a community of practice. Similarities and differences among group members that may affect their interactions include status or academic rank, gender, ethnicity, and professional experience.

2.2.1.1 Academic Rank

In a community of practice in higher education, the instructors may be tenured, on the tenure track, or tenure-ineligible. These ranks correspond with status in the profession. The highest rank is full professor, which also has the highest status. The associate professor is second in order of rank and status, followed by the assistant professor. The tenure-ineligible faculty member is fourth in regards to rank and status, followed by the post-doctoral scholars and graduate student teaching assistants.

The tenure-line ranks include full, associate, and assistant professors. Tenure entitles a faculty member the academic freedom to teach, engage in research, and be involved in outside activities without undue interference from the administration (AAUP, 2003). Tenure also provides economic and job security (AAUP). Upon being hired by a university as a tenure-line assistant professor, an individual typically must serve a probationary period of no more than seven years. In order for assistant professors to advance to the rank of associate professor with tenure, they must meet general

requirements, including academic qualifications, scholarly productivity, length of service and experience, amount of administrative responsibility and teaching performance (U.S. Department of Education, 2002b). Advancement from the rank of associate professor to full professor is a promotion based on measures of performance similar to tenure requirements, however, it is an optional one (Fairweather, 2002). Individuals may choose whether or not they want to be considered for the position of full professor, which has a higher rank and status.

Retired former tenure-line professors, called emeritus, may also be among the staff of instructors at a university. Emeritus professors retain the rank they held at time of retirement, usually full professor. The move to emeritus status is a transfer and may be established anytime after the full professor is over age 55 and has five or more years of service to the institution. The conditions of employment are negotiated between the individual and the institution, and usually involve less than full-time employment and a salary lower than that of a full professor (Mauch, Birch, & Matthews, 1990).

Instructors who are ineligible for tenure are often given the titles of “instructor” or “lecturer.” The primary responsibility of most tenure-ineligible faculty is teaching. Others are hired primarily as research faculty. According to Fogg (2004), tenure-ineligible faculty members are a growing group of “second-class” faculty members. Twenty-five years ago, the National Academy of Sciences (1978) conducted a study of doctoral research staff, and found that tenure-ineligible faculty had fewer privileges and worse employment conditions than tenure-line faculty. More recently, Gappa (2000) found that twenty-eight percent of full-time faculty are ineligible for tenure and have less job security and status in the academic community than tenure-line faculty. Tenure-ineligible

faculty cannot be sure of contract renewal and are often excluded from participating in governance (Gappa). When conflicts arise within a group of faculty, those individuals who are tenure-ineligible do not have protection of academic freedom, which may affect their participation in an academic community of practice (Fogg).

Other individuals who teach undergraduates in universities are postdoctoral scholars (often called postdocs) and graduate students. After obtaining a doctoral degree, many graduates in the sciences seek postdoctoral experiences for different reasons (National Research Council, 2000). Usually, postdocs either teach to expand their classroom experience or continue their research to deepen their understanding of a field (National Research Council). Many graduate students serve as teaching assistants but have little opportunity to actually teach undergraduate students (Pruitt-Logan, Gaff, & Jentoft, 2002). As teaching assistants in the sciences, graduate students are given low-level assignments, such as supervising the laboratory and grading papers (Pruitt-Logan, et al., 2002). Because postdocs and graduate students have the lowest level of status with regard to academic rank, they may be less active participants in a community of practice than tenure-line and tenure-ineligible instructors.

2.2.1.2 Gender

Another individual characteristic that may affect group participation is gender. There are several reasons why gender might affect group members' involvement: there are fewer female than male faculty members at research universities, there is a disproportionate representation of males to females among the academic ranks, there are

more male than female instructors in natural sciences and engineering, and gender role socialization.

Men are more likely than women to work at public universities that grant doctoral degrees.[4] Of the total number of instructors at public four-year institutions, two-thirds are male compared to one-third who are female (U.S. Department of Education, 2001). In addition, the distribution of men and women among academic ranks is unequal at all types of institutions in the U.S. As shown in Table 2-1, there are almost twice as many men as women at the highest rank of full professor, and men outnumber women at the other tenured rank of associate professor. Women outnumber men at the lower and most vulnerable ranks of assistant professor, instructor and lecturer.

Table 2-1: Percentage of full-time instructional faculty and staff at 2- and 4-year (and above) institutions according to academic rank, by gender: Fall 1992 (U.S. Department of Education, 2000)[5]

Gender	Full professor	Associate professor	Assistant professor	Instructor	Lecturer
Male	39.3%	25.2%	18.1%	12.6%	1.1%
Female	15.3%	21.5%	31.8%	21.9%	3.8%

Females are particularly underrepresented in the fields of natural sciences and engineering. According to the U.S. Department of Education (1999), of the full-time

[4] Public doctoral includes research, doctoral and medical institutions (U.S. Department of Education, 2002a).

[5] This includes full-time instructors at all Title IV degree-granting institutions.

instructors at Title IV degree-granting institutions who work in the field of physical sciences, eighty-six percent are male and fourteen percent are female.

In addition to the differences in numbers and representation in ranks, women instructors' participation in a community of practice in the sciences may be affected by gender role socialization. Gender roles are defined and developed by cultural and social expectations that suggest men should be strong, powerful, and aggressive, while women are expected to be weaker, submissive, and compassionate (Reevy & Maslach, 2001). Gender-related social interaction styles may be governed by assumptions about these characterizations (Hibbard & Buhrmester, 1998). For example, the male social interaction style is expected to be status-oriented and focused on goals of dominance and rewards (Hibbard & Buhrmester). In contrast, the female social interaction style is expected to be connection-oriented with goals that focus on cooperation and support (Hibbard & Buhrmester). As a consequence of inequity in numbers in academe and gender role socialization, female instructors may not choose to participate as actively in a discussion among members of a community of practice as the male instructors.

2.2.1.3 Ethnicity

As with gender, varying ethnicities of group members may affect interactions among members of a community of practice. Based on statistics reported in 1997 by Astin, Antonio, Cress and Astin, only ten percent of the professoriate were faculty of color. More recently, Nelson (2005) cited evidence based on data (FY 2003) from the top 50 Biological Sciences and Chemistry Departments that only 11.1% and 10.3%

respectively, of the total number of tenured and tenure-track faculty members were Black, Hispanic, Asian, or Native American. This disproportionate representation may lead faculty of color to perceive being outside the informal networks of their department. Because of subtle discrimination, language barriers, or lack of support, an instructor of color may be less inclined to participate as actively as a group member who is part of the ethnic majority (Turner, Myers, & Creswell, 1999). Even in a group setting that is non-threatening and supportive of ethnic diversity, minority faculty may be less inclined to speak their minds or disagree with the majority, fearing a threat to tenure or promotion. It is also possible that faculty members of the majority ethnic group may not speak as freely or honestly for fear of alienating or insulting faculty members in the community of practice who are members of an underrepresented group. The ethnic composition of a community of practice may affect the participation of a member, depending on her own ethnic background.

2.2.1.4 Experience

Nature and level of experience of the individual members may also affect interactions in a community of practice. Experience in a specific area, such as science, medicine, or music may take individuals a great deal of focused and dedicated practice to develop (Berliner, 1994; Ericsson, 1996).

Within academe, individuals initially gain some experience as professional teachers or researchers from education and training in a graduate program. They may

learn from observing their mentors, specific courses about how to teach or conduct research, and through work as teaching assistants, research assistants, and as postdocs. The experience instructors may gain as doctoral students is one factor to consider when discussing their teaching and research. By engaging in repetition of tasks, individuals may be provided with feedback to correct mistakes and develop knowledge (Ericsson, 1993). A classroom instructor who teaches several sections of the same lab each semester may enhance her teaching experience by using feedback from students to improve her teaching strategies.

Instructors' experience may vary depending on their professional responsibilities. Tenure-line faculty members are more likely than tenure-ineligible faculty to have gained experience in both teaching and research. According to the U. S. Department of Education, National Center for Education Statistics (2001), instructors at public research institutions who teach in the natural sciences reported that 29.0% of their time was spent on research compared to 58.7% on teaching. This average masks differences by rank and status. Tenure-line faculty may spend more time on research than teaching, and tenure-ineligible instructors may spend little time on scientific research (U.S. Dept. of Education, 2001). Consequently, tenure-line faculty may be likely to have more experience at research and less experience with teaching than tenure-ineligible faculty with similar years of total experience at universities, but whose primary responsibility is teaching.

Depending on the topic under discussion, the teaching and research experience of a member of a community of practice may affect how much she participates. A tenure-line instructor who has focused primarily on scientific research may participate more

actively when the community of practice talks about research than when the talk is about teaching. An instructor who is tenure-ineligible and has more teaching experience than research experience may participate more actively when the discussion focuses on teaching than when the conversation is about research. A tenure-line faculty member who has experience in both teaching and scientific research may be able to discuss connections between teaching and research more easily than colleagues whose experience lies in only one of the academic roles. If an individual feels she is not knowledgeable on an issue, she may choose not to contribute to the conversation.

In addition to academic rank, gender, ethnicity and experience, another individual characteristic that may influence interaction among members of a community of practice is professional identity.

2.2.2 Professional Identity

The self is a set of discrete identities or roles. Identity is defined by Descrochers Andresassi, and Thompson (2002) as the answer to the question “Who am I?” An identity may be described as a role an individual plays, and the meaning the person attaches to that role (Stryker & Burke, 2000). Identities may be related to the family, occupation or community. The more relationships one is involved in, the more identities in the set comprising the total self. Individuals have as many identities as the number of social systems in which they participate (Stryker, 2002). Three elements of an individual’s professional identity are relevant to this study: how the individual identifies as a teacher, as a researcher, and how the individual views the relationship between these two roles.

Identity salience is the chance that one identity will be used in a given situation (Stryker, 2002). The relative salience of various identities influences the effort an individual puts forth in a role in a given situation and how well he performs that role (Desrochers, et al. 2002). For example, for an associate professor whose professional responsibilities include teaching and research, her researcher identity may be more salient when she is performing an experiment in the lab, but her teacher identity may be more salient when grading a student's exam.

2.2.2.1 Teacher Identity

According to Palmer (1998), a good teacher is one who has a strong sense of personal identity that connects with his work. This identity is shaped by the individual instructor's philosophy of teaching or perspective on curriculum. According to Posner (1995), there are five important curricular perspectives, including traditional, experiential, structure of the disciplines, behavioral, and cognitive.

The traditional perspective emphasizes transmission of worthwhile knowledge, and important skills to students (Posner, 1995). Instructors who are traditionalists may see themselves as experts who provide students with important facts and knowledge of their cultural heritage.

In the experiential perspective, learning evolves from the students engaging with their environment (Posner, 1995). Instructors who espouse the experiential perspective may see themselves as mentors facilitating students' process of discovering their own

unique potential as human beings by relating their current experience with the subject matter.

The perspective of curriculum and teaching labeled “structure of the disciplines” focuses on the theory and structure of knowledge within each body of knowledge called a discipline (Posner, 1995). A chemistry instructor, for example, might see himself as an expert who understands the theories, methods, and values involved in being a chemist. The task of teaching becomes showing students how to think, conduct inquiry, and analyze as chemists do (Posner).

Instructors whose curricular perspective is behavioral are likely to focus on what students should be able to do and how they will acquire these behaviors (Posner, 1995). Instructors who espouse to the behavioral perspective may see themselves as trainers who shape the students’ development of observable skills step-by-step. These instructors predetermine the skills students should acquire and then set curriculum goals and objectives to delineate how and when students should demonstrate desired observable skills.

An instructor whose curricular perspective is cognitive concentrates on helping students learn how to think (Posner, 1995). Instructors who have a cognitive perspective are interested in students developing critical thinking skills and they “provide opportunities for students to make their own ideas and explanations of the events explicit” (Posner, p.111).

The level of participation and type of communication demonstrated by instructors in the community of practice may depend upon their identities as teachers enacted in their perspectives on curriculum and teaching. For example, an instructor whose teacher

identity is based in a traditional perspective may participate actively during a discussion on concepts and facts that students should learn; in contrast, an instructor whose teacher identity is grounded in a behavioral perspective may actively contribute to a conversation about specific and measurable skills students should demonstrate by the end of the course. The teacher identity of an instructor may include one or more of the perspectives discussed by Posner (1995), or perhaps another perspective altogether.

2.2.2.2 Researcher Identity

The researcher identity of instructors may be related to how each individual approaches the development of knowledge. Boyer (1990) discusses four arenas of scholarship: discovery, integration, application, and teaching. The first three may be seen as related to one's identity as a researcher, while the fourth, scholarship of teaching, is a way of linking research and teaching (Colbeck, 2004). Any faculty member may identify with one specific area of scholarship, or some combination of the four arenas.

Scholarship of discovery is the closest to what has traditionally been considered "research" in universities (Boyer, 1990). Individuals who engage in the scholarship of discovery are invested in pursuing and investigating knowledge for its own sake. Instructors whose research identity is focused on the scholarship of discovery may believe the advancement of knowledge is exciting and crucial to the survival of the academy. According to Boyer (1990), the research identity of faculty members at research universities is more likely to focus on scholarship of discovery than that of

faculty members at other types of institutions such as comprehensive universities and liberal arts colleges.

The scholarship of integration focuses on connecting fragments, concepts, or isolated facts within a discipline or across disciplines (Boyer, 1990). Individuals whose researcher identity addresses integration may synthesize ideas within their own discipline, such as writing textbooks, or may be involved in interdisciplinary research. By connecting related concepts, individuals who identify with the scholarship of integration are able to provide new insights about existing knowledge (Boyer).

The scholarship of application involves applying knowledge and skills to address societal problems. Instructors whose research identity is grounded in the scholarship of application may be involved in problem-solving and service to the community. Braxton, Luckey, and Helland (2002) report that faculty members engaged in the scholarship of application may be less likely to publish their work than the more traditional research involved in the scholarship of discovery.

Instructors' research identities are likely to affect their participation in discussions within the community of practice. Instructors whose research identity relates to the scholarship of application may actively participate in a discussion of how technology can be used to enhance classroom teaching while instructors whose research identity is grounded in the scholarship of discovery may become very excited and participate more when discussing an upcoming visit from a Nobel Prize winning scientist.

Boyer's (1990) fourth category of scholarship, the scholarship of teaching, provides the bridge between the teacher identity and researcher identity. Later researchers identify this category as the scholarship of teaching and learning (Hutchings & Shulman,

1999), defined by Kreber and Cranton (2000) as reflection on research-based knowledge and experiential knowledge about instruction, pedagogy, and curriculum, in ways that can be reviewed by peers. Hutchings (2000) describes the scholarship of teaching and learning as 1) being embedded in the discipline, 2) an aspect of practice, and 3) characterized by a transformational agenda. Furthermore, the success of the scholarship of teaching and learning is measured by its impact on thought and process (Hutchings, 2000). The individual whose identity is focused on the scholarship of teaching may also be referred to as an integrated professional.

2.2.2.3 Integrated Professional

Organizations, including universities, may either subdivide complex labor into relatively simple tasks performed by different workers, or they may hire highly qualified and flexible workers to perform an integrated set of complex tasks (Scott, 1998). An example of the former would be a factory assembly line. An example of the latter includes individual faculty members teaching at a university who teach, conduct research, and perform service.

Instructors who purposefully combine their roles of teacher and researcher may be described as integrated professionals. Many instructors engage in more than one work activity at a time. An observational study of twelve faculty conducted by Colbeck (1998) found that, on average, they engaged in activities that simultaneously accomplished teaching and research goals almost twenty percent of their working time. According to Colbeck (2004), there are several ways in which instructors may choose to integrate their

teaching and research roles, including involving students in research, or applying research skills to their teaching.

When using the mode of linking teaching and research sometimes known as "inquiry-based teaching," instructors engage students in actually doing research either in the classroom or the laboratory (Colbeck, 2004). Lindsay, Breen, and Jenkins (2002, p.56) see this strategy as a way to motivate by helping students learn "about and through research."

Another way faculty may integrate teaching and research is by engaging in Teaching-as-Research. Using Teaching-as-Research, instructors approach teaching the same way they approach their research - by hypothesizing, implementing, observing, analyzing, and improving (CIRTL, 2003). This way of linking teaching and research is similar to the more commonly discussed scholarship of teaching (Boyer, 1990) or scholarship of teaching and learning (Hutchings, 2000, Kreber and Cranton, 2000).

The scholarship of teaching involves four interrelated elements: the teaching is public, accessible to others for adoption or adaptation, involves inquiry regarding issues of student learning, and may be reviewed and evaluated (Hutchings & Shulman, 1999). In a similar manner, Teaching-as-Research is described by CIRTL (2003) as "involving the deliberate, systematic, and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and learning outcomes of students and teachers." Individuals who are teachers and action researchers believe that inquiry helps them to improve their practice as teachers and assists in student learning (Girod & Pardales, 2002).

In this section, I discussed how individual characteristics, including rank, gender, ethnicity, experience, and professional identity, may affect an instructor's participation in a community of practice. To explore the possible relationship between individual characteristics and collective sensemaking, it is helpful to understand how a community of practice is more than just a group of individuals.

2.2.3 Community of practice

A group is comprised of two or more persons who interact with each other regarding a common goal (Johnson & Johnson, 1999). Members of a group interact with each other based on the norms and culture of the group (Brilhard, 1978). Group work often involves some type of negotiation in which the members attempt to reach an agreement relative to a particular view or make a decision regarding an idea (McGrath, 1984).

A community of practice may be a group of individuals who are pursuing learning focused on a specific topic (Buysse, et al., 2003). The environment for individual growth through collaborative relationships and activities is created through a community of practice. Lave and Wenger (1991) speak of individuals who are engaged in the same practice such as tailors or mathematicians as belonging to a community of practice. Characteristics often found in a community of practice include sharing ideas, equal responsibility for the members, a sense of community, learning from experience, and ongoing reflection among the members about the interaction of knowledge and experience (Buysse, et al., 2003; Wenger, 1998). Barab and Duffy (2000) identified three

essential characteristics of a community of practice: 1) its members have similar goals and meanings as well as a common history, 2) it is located within a larger system, and 3) it has a reproduction cycle as older members leave and newer ones join. The term "community of practice" has been used to describe teacher education groups (Buysse, et al., 2003), academic departments (Hodkinson & Hodkinson, 2003) and corporate research centers (Brown & Duguid, 2001).

There are several benefits for instructors who participate in a community of practice. They include having contact with other instructors who they can learn from, being exposed to the teaching experience of others, learning about new teaching skills to employ, participation in conversations about their own innovative teaching ideas, and getting support from other instructors. This supports research by Rogers (1995) and Foertsch et al. (1997) that states instructors may benefit from conversations with peers when getting ready to teach. According to Printy (2002), there is a significant relationship between membership in a community of practice and an increase in teacher learning and competence, provided the teacher fully participates in the group discussion and interacts with other members. However, it is important to keep in mind that while social learning within a community of practice may equip teachers to improve their instructional practices, change happens slowly (Bidwell, 2001).

Whether communities of practice operate in an educational realm or within another type of organization, they have several characteristics in common: norms or values developed by the members (Birnbaum, 1988; Brilhard, 1978); relative power of group members (Contu & Willmott, 2003; Huzzard, 2004); and communication (Brilhard, 1978). In communities of practice, the number of individuals in the group may

fluctuate as the membership changes (Buysse, et al., 2003). According to Pugach (1999), communities of practice may include members with many levels of experience and there may be no formal leadership (Pugach).

2.2.3.1 Norms and values

Research on group processes suggests that two key variables influence the behavior and outcome of groups: structural (values and preferences) and procedural (group rules) (Beersman & DeDreu, 2002; Mannix, 1993; Weingart & Brett, 1998). The values and norms espoused by members of a group govern their behavior (Scott, 1998).

Values are the criteria used when deciding upon the goals of behavior (Scott, 1998). Values demonstrate what is of most importance to the group. For example, the group may value their professional responsibilities, knowing and understanding each others' philosophies of teaching, or honoring the opinions of all members regardless of academic rank. Norms are the often informal and unspoken rules that govern the behaviors of participants, such as who speaks first in the group, who provides the agenda for each meeting, or whether interruptions are tolerated (Scott).

Another characteristic of a community of practice that may influence sensemaking is the relative power of the members.

2.2.3.2 Relative power

Although there may be no formal structure of power within a community of practice (Lave & Wenger, 1991), there is likely to be an informal sense of balance and power among members of the group. The power held by each individual in the group is relative to that held by other members, and is specific to the situation (Pfeffer, 2001). For example, two associate professors in the same department are of equal status at a faculty meeting. If one is appointed to head a College task force, however, in that situation, he has more power than his colleague. Whether power is formal or informal, it provides an individual with opportunities to influence others (Scott, 1998). There are several types of power that may be attributed to a group member, based on individual characteristics. French and Raven (1959) distinguish five types of power: reward, coercive, legitimate, referent and expert.

French and Raven (1959) define reward power as being dependent upon an individual's ability to either give another something positive or take away something negative. For example, a department head exercises reward power when she tells a tenure-line assistant professor that he can reduce his participation in a couple of department committees because he succeeded in securing a large grant to support his research.

Coercive power refers to the ability to punish another if the other does not conform (French & Raven, 1959). A tenure-seeking professor concerned about coercive power being used against her may believe that she must support a tenured full professor

in a group controversy if the full professor is a member of the department promotion and tenure committee.

Legitimate power is based upon an individual's perception that another person has the right to prescribe behavior for him (French & Raven, 1959). For example, a post-doc may see an associate professor as having legitimate power because he believes that the higher academic rank allows the associate professor to tell him how to teach a particular topic (French & Raven).

Referent power differs from legitimate power in that an individual has a desire to emulate the individual who has the legitimate power (French & Raven, 1959). For example, a new assistant professor who admires the person and desires the rank held by a respected associate professor in her department may assume practices, attitudes and values similar to those of the associate professor because of his referent power.

Another type of power defined by French and Raven (1959) is that of an expert. An expert is a member of a community who is seen as having the most knowledge or experience regarding the subject at hand (French & Raven). This experience is based upon how much knowledge the individual has compared to an absolute standard (French & Raven). For example, the author of the text book used for a multiple section course may be seen as the expert by the other instructors teaching other sections of the course. Therefore, they may defer to her judgment when there is a question about how to teach a section of the textbook.

Along with norms, values, and relative power, the conversation and the communication used in a community of practice may influence individual and collective sensemaking. The type of communication is as important as the subject being discussed.

2.2.3.3 Communication

In a community of practice, group members share their thoughts and ideas (Haberman, 2004). This communication is a necessary part of group work, so that each member understands what the others are thinking. Working together in a group requires collaboration and dialogue among the members. In order to understand the interactions of the members of a community of practice, it is necessary to examine not only how the individuals are talking to each other or their type of communication, but also the topics of their conversations.

2.2.3.3.1 Type of Communication

The type of communication refers to the various forms of communication demonstrated by the members of a community of practice. In an analysis of group communication, Campbell (2001) discovered how various types of communication influenced the progress of problem-solving for groups of undergraduate engineering students. For example, Campbell (2001) found that clarification statements, statements asking for clarification, and off-task communication inhibited the progress of problem-solving while encouragement and support helped to facilitate the process. The types of communication Campbell (2001) identified were expanded for this study and are defined in Table 2-2.

Table 2-2: Type of Communication

Initiation	Earliest mention of a specific issue
Restatement	Repeating a statement/question, or asking for something to be repeated
Asking for restatement	Asking for something to be repeated
Clarification	Development of an idea through elaboration, example or explanation
Asking for clarification	Asking for an explanation of an idea
Substantiation	Offering proof or evidence
Asking for substantiation	Asking for proof or evidence
Modification	Revising an idea
Asking for modification	Asking for the revision of an idea
Acceptance	Accepting an idea
Asking for acceptance	Asking others to accept an idea
Rejection	Rejection of an idea
Asking for rejection	Asking others to reject an idea
Synthesis	Making connections between ideas
Asking for synthesis	Asking someone to present the connection
Summary	Paraphrasing
Support	Helping or praising

2.2.3.3.2 Topic of Communication

A community of practice may provide a context where the participants can share ideas and analyze the learning, knowledge and work to be transformed (Brown & Duguid, 2001). The communication that occurs within a group involves give and take between members, talking and sharing their individual interpretations during the process of sensemaking (Weick, 1993). The process of sharing interpretations and conversing

with each other in the group lends itself to individuals becoming committed to their actions. The community of practice observed for this research was exposed to a topic that was new to some of the members, the concept of Teaching-as-Research.

The topic of communication in the community of practice refers to what goal the communication is directed towards (Campbell, 2001; Hirokawa, 1980). In this study, the goal of the communication was identified as: teaching, research, teaching as research, procedural (related to the group mechanics), logistics (planning of meetings other than that of the community of practice), administrative (related to equipment purchases, budgets), or off-task (statements or questions not related to the previously listed topics). Initially, I had not identified the categories of procedural and administrative. However, after I began coding the topics of communication, it was evident that these were additional topics that the group discussed and so I added them to my coding scheme.

Another major concept within the framework of the study is sensemaking, both individual and collective.

2.2.4 Sensemaking

2.2.4.1 Individual Sensemaking

Individual sensemaking or reflection involves what a group member is thinking as a result of participation in collective sensemaking or their own current experiences. Reflection, which Reiman (1999) refers to as constructing meaning from experience,

frequently coincides with engaging in a new activity or refocusing on a current activity such as a method of teaching (Reiman).

Schön (1983)'s theory of professional development discusses how teachers and other professionals learn through their experiences. He describes reflection-in-action and reflection-on-action (Schön). When reflecting-in-action, individuals think about what they are doing while they do it, "thinking on your feet" (Schön). Instructors' reflection about current experience in the classroom, doing assessment, research in the laboratory, or informal meetings with students may affect their professional identities.

Similar to Weick's sensemaking, Schön's reflection-on-action is retrospective. Instructors think about past experiences, analyzing and summarizing them in order to make generalizations that may affect their future actions. Individual sensemaking becomes collective when a group is involved in trying to understand and derive meaning from a situation.

2.2.4.2 Collective Sensemaking/Committed Interpretation

Committed interpretation within a group focuses the collective sensemaking process as group members review their actions and justify the meaning of those actions. As individuals participate in a community of practice, collective sensemaking with other participants may, over time, lead to changes in their professional identities.

The explanations voiced during committed interpretation are voluntary, public, and explicit, features that help solidify the commitment of the individual to the justifications (Weick, 1993). Justifications are *voluntary*, in that the individuals have not

been coerced to share their interpretation, but do so because they are invested in the learning and participate of their own free will. Justifications are *public* rather than private or secret, because they are articulated to others inside or outside the group. In addition, justifications are *explicit;* they are explained in clear terms so that group members understand each other and outsiders understand the group. Because committed interpretation involves justifications that are voluntary, public and explicit, the meaning the group and participating individuals derive from their communications may, over time, change individual instructors' sense of professional identity.

2.2.5 Eventual professional identity

According to Stryker (2002), self-perception, or the identity individuals attribute to themselves, is shaped through interactions with others. In describing identity, Stryker draws on components of the symbolic-interactionist framework, which is similar to Weick's theory of sensemaking. Both symbolic interactionism and sensemaking consider that the actions and reactions individuals exhibit are based on interpretations of their interactions with others. The meaning individuals construct from these interactions helps to shape their individual identity. Within a community of practice, the interactions and collaboration may affect an individual group member's professional identity (hooks, 1994). Through ongoing communication with each other in the community of practice, instructors share with each other, expand each others' knowledge, and may find their sense of professional identity changing because of their participation (Buysse, et al., 2003). Barab and Duffy (2000) suggest that "the development of self through

participation in the community (p.35)" is a distinguishing characteristic of communities of practice.

When engaging in collective sensemaking about a specific topic, such as Teaching-as-Research, the individual characteristics of the instructors (including rank, gender, ethnicity and experience) as well as the characteristics of the community of practice (such as the norms and values, relative power, and communication) may interact to influence changes in one or more aspect of individual professional identity. It is also possible that an individual participant may experience little or no change in professional identity.

For example, a female faculty member who has taught full time for several years but is ineligible for tenure may initially have a strong sense of professional identity as a teacher, but not as a researcher nor as an integrated professional. If the norms, values, and nature of communication of the community of practice foster her active participation, and she feels rewarded by colleagues with more status and power for articulating how she engages in Teaching-as-Research in her classroom, her professional identity may change. She may now see herself as an instructor who integrates teaching and research in her work.

A second hypothetical example is a male emeritus professor who has conducted basic scientific research and taught for many years. Initially, he may have strong identities as a researcher and as a teacher, but not as an integrated professional. If conversations about Teaching-as-Research encourage him to apply his research skills to his teaching, and if the group provides validation for his efforts, the emeritus professor may gain a stronger sense of identity as an integrated professional.

Finally, a male assistant professor who has many externally-funded research projects and a reduced teaching load may see himself primarily as a researcher rather than as a teacher or integrated professional. He may be attracted to participate in the community of practice because he perceives other participants have legitimate power over his upcoming promotion. He may decide, however, that the concept of Teaching-as-Research and the group discussion are not relevant to his primary role, and participate only sporadically. Consequently, there would be little change in any of his professional identities.

Chapter 3

Research Methods

This case study explored how the process of sensemaking about Teaching-as-Research within a community of practice affected individual instructors' professional identities as teachers and researchers, and how they viewed the integration of these two roles. Sensemaking has been used in research as a lens through which to examine organizational changes, both in the corporate world and in academia. This study focused on changes in the professional identities of instructors that may have occurred as a result of their participation in collective sensemaking in a community of practice. Sensemaking is an ongoing process for group members, but this particular study focused on interactions and changes that took place in the time period of one academic semester during which the members of the community of practice were introduced to the concept of Teaching-as-Research.

This case study used qualitative research methods because the focus was on how the individuals in the community of practice made sense of what occurred within the group and how participation influenced their professional identities. A research study that focuses on understanding how a unique context shapes individual perceptions and events is best suited for qualitative methods (Maxwell, 1996). Case study research often uses an entire population so that results can be used to build or extend theory (Eisenhardt, 1989). The generalizability of a case study relates to theoretical propositions and not to

populations (Yin, 2002). There are several working propositions that may be derived from this study, and even though they are based on a single case study, the propositions derived can be tested in studies involving other communities of practice.

3.1 Overview

I contacted each member of the community of practice and asked if they would be willing to be observed and to learn about the concept of Teaching-as-Research as defined by the Center for the Integration of Teaching, Research, and Learning (CIRTL) (2003). The mission of CIRTL is to develop a national faculty in the disciplines of science, technology, engineering, and mathematics who are committed to implementing and advancing effective teaching methods (CIRTL, 2003). Initially, CIRTL focused on the development, implementation, and evaluation of a professional development program for teaching and learning based on three guiding principles, Teaching-as-Research, learning communities, and learning-though-diversity (CIRTL). CIRTL (2003) defines Teaching-as-Research as involving the deliberate, systematic, and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and outcomes of students and teachers. Learning communities are opportunities to bring people together for shared learning, discovery, and the generation of knowledge, where everyone takes responsibility for the group achieving learning goals (CIRTL). Finally, the third pillar, learning-through-diversity is grounded in the belief that effective teaching capitalizes on the resources of the faculty and students (their collection of background, experiences, and skills) for the benefit of all (CIRTL). Once the

professional development program was developed, CIRTL moved to its current focus which is the development of a network community of ten universities that will adapt the program to meet the needs of their specific graduate students, post-doctoral researchers and faculty members in the disciplines of science, technology, engineering, and mathematics.

The researcher, who has been involved in CIRTL, chose the group because they are a community of practice interested in undergraduate science education sharing similar objectives to those of CIRTL. I interviewed each member of the core community of practice two times. The first interviews were conducted early in the semester. After the first interview, a visitor was supposed to describe the concept of Teaching-as-Research. Instead, she described how her department had accomplished curriculum changes over the past few years. The changes involved Teaching-as-Research, but the visitor neither used nor defined the concept. Therefore, another visitor came to the group the following week and provided a presentation on Teaching-as-Research.

Over the course of the semester, I observed a total of twelve weekly sessions of the community of practice. These observations focused on the group's norms and values, demonstration of relative power, communication, and collective sensemaking. At the beginning of the following semester, I interviewed individual participants again to determine if there were any changes to their own perception of their professional identities.

3.1.1 Sample

This Woodland University community of practice has been meeting regularly for more than ten years. The participants were instructors in the same department within the College of Science at Woodland University. Membership in the group has changed over time, but initial conversations with a key informant indicated that the group values and norms have remained constant. The group continues to meet approximately one hour per week over lunch to discuss issues related to the curriculum and other ideas focused on improving undergraduate education in their department. Initially all fourteen members who attend regularly agreed to participate in the research. One attended only four of the twelve sessions and was unable to participate in the final interview, so only thirteen participants are included in the analysis[6]. The group included tenured faculty, tenure-line faculty, emeritus faculty, and full-time faculty not eligible for tenure. There was also a post-doctoral scholar who participated actively.

3.1.2 Data Collection

Data collection strategies included gathering demographic information from the participating members of the community of practice, interviews with each member, and observations of the group meetings. Appendix A relates the components of the Conceptual Framework to the information that was gathered from each of the strategies.

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[6] All study participants regularly attended in the groups, which I defined as attending at least half or six of the total meetings observed, and participated in both the initial and final interviews.

3.1.2.1 Demographics and Initial Interview

I interviewed each member of the community of practice early in the semester before they were introduced to the concept of Teaching-as-Research. The questions that framed these interviews are contained in Appendix B. Open-ended questions elicited the participants' points of view without the prejudice of the interviewer (Patton, 2002). Each interview was approximately one hour in length and was tape-recorded. The interviews were then transcribed.

The questions addressed the individuals' personal characteristics, their professional identities, and characteristics of the group. Questions about each participant's characteristics and identities included their rank and experience, identities as teachers and as researchers, and integration of teaching and research. Questions about group characteristics included level of participation, communication in the group, norms and values, and the relative power of the group members. An additional question was asked of the participants by phone or email after the initial interviews, but prior to the intervention: "What does the term 'Teaching-as-Research' mean to you?"

3.1.2.2 Intervention

Following the completion of the initial interviews, the community of practice was introduced to the concept, Teaching-as-Research. An individual who is involved with the CIRTL project presented the idea of Teaching-as-Research during the Fourth Session of the community of practice. She provided participants with an overview of Teaching-as-Research and discussed its relevance to their field. The members of the community of

practice had the opportunity to ask questions regarding Teaching-as-Research. The visitor specifically asked members of the group to discuss in pairs ways that they may have applied the concept of Teaching-as-Research.

3.1.2.3 Observations

The observations involved the entire community of practice during their weekly lunch sessions. Observations of these sessions provided rich data regarding their interactions and collective sensemaking. I audio-taped the sessions and transcribed each one. I also took field notes to assist with the transcription because there were thirteen voices to recognize. I focused on the collective sensemaking, norms and values, the topic and the type of communication, and any evidence of individuals' relative power. Appendix C lists the codes that I used to classify each utterance during the weekly sessions. An utterance is described by Hirokawa (1980) as "the continuous flow of verbal communication by a group member to the point at which s/he terminates verbal output or is interrupted by another participant (p. 314)." Appendix D shows how these utterances and the corresponding codes were documented.

Observation of the group began as soon as the first member arrived at each scheduled session and continued until all of the participants left the room. This complete record of informal communication provided additional insight into the relationships among members in the group. There were no activities during the group that were not recorded, and there were no sessions of the whole community of practice other than the weekly lunch sessions.

3.1.2.4 Final Interviews

I conducted final interviews with all (but one member) of the community of practice who were interviewed at the beginning of the fall semester. The final interviews took place at the beginning of the spring semester 2005. The final interview guide is in Appendix E. This interview elicited information about each individual's identity as a teacher, researcher, and integrated professional. I asked each participant to define the concept of Teaching-as-Research and discuss how, if at all, discussing this concept in the community of practice affected his or her professional identity. Participants were also asked to discuss their opinions about how discussing the concept of Teaching-as-Research affected the community of practice as a whole. These interviews were tape-recorded, and most were 45 to 60 minutes in length, although some were longer. These interviews were also transcribed.

3.1.3 Data Analysis

Data analysis was an ongoing process. As suggested by Maxwell (1996), analysis began once the first interview was completed and continued until after all the data was collected. This process helped me to avoid a difficult and overwhelming final analysis. The data analysis for this research involved both descriptive and relational analyses focusing on 1) similarities and differences in patterns of change (or no change) in professional identities among members of the community of practice; 2) associations between communication patterns, power dynamics, and collective sensemaking in the

group; and 3) relationships between relative power in the group, individual sensemaking, and change in professional identity.

3.1.3.1 Participants

The first level of analysis was to characterize the group members, and describe them in terms of individual characteristics, such as rank, gender, ethnicity, and level of experience. This information was collected from the transcripts of the initial interviews. I compared their initial professional identities as teachers, researchers, and integrated professionals with patterns derived from the literatures on teaching philosophy (Posner, 1995), scholarship (Boyer, 1990), and integrated professionals (Colbeck, 1998). These patterns, however, did not prevent me from exploring other possibilities suggested by the empirical data.

Any changes in the participants' professional identities were ascertained from analysis of the final interviews. I compared responses to identical questions about identities as teacher, researcher, and integrated professionals asked during both the first and final interviews. I then compared participants' own comments about how they had or had not changed with my observations of any changes in their participation in the group over the duration of the study. I charted each individual's responses and comments separately and compared statements to determine any change in verbalization or comments made. If a participant did not answer the question, I coded it an N/A, indicating no response. Responses were coded as *no change*, *some change* (where there was some change in the response such as an elaboration or modification in explanation),

and *change* (when the majority of the response changed). With eventual teacher and researcher identity, I indicated the specific description of change.

Finally, I analyzed transcripts of the interviews for individuals' perceptions abut norms, values, communications, power, and sensemaking in the community of practice.

3.1.3.2 Coding of Communication

The next step was to examine communication and relationships within the community of practice. First, I coded each utterance of the transcripts of the group's weekly sessions according to the topics of communication discussed and the types of communication used by rank, gender, ethnicity, and experience of the speaker. I also decided that if an individual's continuous communication changed topic or type, then I would count the speech as two separate utterances. For example, during Session Two, Keith agreed with a statement made by Ben and then continued to talk about how that curriculum change would be made.

> I mean, I agree with Ben, I just had a science major come up to me on the second week of classes saying, "I'm dropping this course". This is somebody who has decided in two weeks he's not going to be a science major…
>
> If the goal is going to be, if the course is oriented toward what is your life going to be like within the classroom, what kind of activities are available to you outside the classroom, how are you going to be able to grow and develop most within this major…

I coded these two utterances separately. While both were concerned with the topic of teaching, the first supported another's statement (10) and the second served as an elaboration (4).

3.1.3.2.1 Topic of Communication

When coding each utterance, I set specific guidelines for deciding the topic of conversation. When I coded an utterance as *teaching*, it was related to students' coursework, curriculum, the role of TAs, or testing. Examples are:

> I mean you don't want to educate another generation of scientists who don't know what a molecule is, but only talk about ACTA using letter acronyms instead of understanding that there are bonds holding atoms together.

> Well, you would know too, with the number of TAs you have, you would know what the learning curve is for them to enter the grades. If the learning curve is too steep, then we just wouldn't use it, but if the learning curve seems really reasonable…

An utterance coded as *research* dealt with issues such as writing a proposal for a research grant from NSF, sustainability of programs after grant monies are gone, and research faculty projects. For example,

> If I am going to write another NSF proposal, I need more university and probably College of Science demographics; who should I get them from?

> The big ticket that we have is all the projects that we do. We do projects and we have huge amounts of people in our labs. We do these projects and I think that's going to be the selling point. To continue to do these projects, to do innovative work we …I just wanted to see how you guys felt before I sort of plunged ahead.

Utterances that I coded as *Teaching-as-Research* related to changes made in curriculum or pedagogy based on research or feedback from students, discussions regarding educational research, and ways that the faculty members sought feedback from students.

> There's a very simple way of getting information on how to improve your teaching that I am amazed that we don't use more often. "Ask the students." I give them a thing, their name on the top, and you get credit if you fill this survey out. They always answer and they always answer

> honestly. They don't care if it's bad, good, or indifferent; but the deal is you have to be specific.

> I have a weekly advisory committee and the composition of the advisory committee changes weekly. I invite students with certain last names each week, the size is typically 25 students… it's just like they are the board of directors for the course and I'm their CEO. They talk to me about the course, what's working, what's not; what should I be doing, what shouldn't I be doing and I gear my lectures towards that.

Procedural utterances were related to the functioning of the community of practice such as the addition of a new group member, the time and day of the week to meet, agenda items, and people who might come and present information to the group.

> I have one more item before we go, maybe or I go. Should we start these meetings at 12:15, since until then, only 2 or 3 people are ever here and we go until 1:15 anyway?

> We thought that it would be fun to offer the opportunity to whoever wanted to take the podium for a while and say something about an advancement in a class or something that's going on in a specific class or lab situation rather than doing just always tons of miscellaneous items like we usually do. Donna has been waiting patiently for a few weeks to talk about (specific class).

Conversation that I coded as *logistics* were utterances related to other meetings that members of the community of practice might be interested in, including when the other meetings were scheduled, who should attend, what the agenda might be.

> (Name) emailed me about wanting us to come in so I thought that it would be a good thing for (student organization) to do. One of the three of us should probably be there with them; it doesn't matter who goes with them?

> Last year (at University meeting) we had little 5 minute presentations on new stuff, and then basically a free for all, question and answer, and gripe session about what was going on and the whole point is just to network.

Administrative utterances were related to purchases of equipment, budgets, arranging classroom space, developing a floor plan for newly available space, and how to present the plan to the administrators.

> We don't have to have 25 grand, but Kim needs new computers upstairs and we do need a couple new computers down here. They get hammered down here because they get so much use and we need to sit down and look at…
>
> (Discussing how to provide electricity to a laboratory room) Well, you could bring it in overhead and drop it down like they do in the big research labs. You don't want to get into jack hammering up a concrete floor to put in a trench, just pull them over head from a drop framework.

Finally, statements that were not related to academic work, such as personal concerns, current weather, sports, or local news, I coded as *off-task* utterances.

> I spent a lot of money this summer getting a water abatement deal. We had a sump pump put in my basement and we've been dry all summer for the first summer in quite a while. How about you?
>
> I'll leave places when the football team is down and go places when the football team is up. Maybe that will be the way I pick my jobs in the future.

There were some utterances that initially could have been coded in more than one category. For example, I initially thought I could code the following utterance as either research or teaching. However, upon further review, because the research is related to studying science and making curricular changes, I coded it as Teaching-as-Research (TAR).

> They are asking if there is anyone who would participate in the math-science partnership…I wish education would come to us and say, "This is the question we'd like to study, this is what we are interested in finding out, and we need scientists to partner on this curricular issue."

Another example of an utterance that could have been coded in multiple categories is the following statement:

> Whatever we do, we are not going to solve the problem, but we can make a midcourse correction and try to improve things from where they are.

At first I considered coding the statement as Teaching-as-Research because it talks about making changes to a course. However, when read in context, the statement deals with grading for TAs and the need to be more specific in the requirements for that position. Therefore, I coded it as teaching.

I coded the following utterance as administrative because, although it is related to teaching, the focus was on the purchasing of equipment for classes. All other budgeting and purchases for courses were coded as administrative.

> I need my computer to write the labs, to grade the labs, to write the lectures and other stuff. She needs one because we are doing projects in (specific course).

3.1.3.2.2 Type of Communication

There were several types of communication that were used most frequently during the twelve sessions: clarification, statements asking for clarification, acceptance, and statements of modification. Two of the types of communication that participants used frequently were clarification statements and statements asking for clarification. A *statement of clarification* occurred when the participant developed an idea or concept by providing some elaboration, an example, or more information; and when a participant asked for more information, this was a statement *asking for clarification*. In a session

when the new major was being discussed, for example, Eric talked to the others about the courses that should be added:

> Eric: this is a lab-oriented course, so we have to fit it into our lab schedule (clarification statement)
>
> Justin: so what is the time line here, I don't understand. Do they want it now? (asking for clarification)
>
> Eric: for now we are proposing next spring for this course (clarification statement)

A third type of communication participants used often during the sessions was acceptance. A *statement of acceptance* occurred when on participant agreed with or verbalized approval of another participant's statement. An example of a statement of acceptance occurred when the group members were planning an evening meeting with freshmen, at which senior members in the program were going to talk about their experience in the major.

> Justin: you could plant some questions with some of the freshmen you know better and make sure that those important questions get asked (clarification of a previous statement)
>
> Keith: it's a great idea. How about I confer with the two of you...(acceptance statement)

Modification statements also occurred rather frequently. A *modification statement* occurred when an original idea was revised by a participant. Participants used modification statements, for example, during Session Seven when members of the community of practice asked Donna about the changes she made in her course.

> Donna: You know I do tell my TAs to go about this grading thoroughly; you've got to look for every little thing. And there was one TA who wasn't really aware of this and he said, "Oh, grammar counts?" And I said, "This is a writing course." And I did make that clear at the beginning but I guess he wasn't listening but now his grading is better. (substantiation statement)

> Eric: I think some of their grade should be spelling, at least 75% or more. Follow [specific program] format (modification statement)
>
> Kathy: You could also hit on content (modification statement)
>
> Justin: just say, "Awkward, bad grammar", and hand it back to the student to fix it (modification statement)

Additional types of communications used by participants, although not as frequently, include substantiation statements, initiation statements, and statements of rejection. A *statement of substantiation* occurred when an individual would offer evidence to support her or another member's previous statement. One example took place in Session Three when members of the community of practice were discussing student cheating on an online placement test:

> Justin: we used to give the test on campus, and then we went to an online system that is un-proctored and means nothing (clarification statement)
>
> Shelley: it's cheaper and that's it (clarification statement)
>
> Michael: the students will admit that they use books or other resources while taking the exams (substantiation statement)

Initiation statements occurred each time a new topic was first mentioned by a group member. For example, during Session Seven:

> Eric: this is a discussion that Shelley, Donna, and I had about what we can do to integrate our curriculum. It seems what we are doing is making attempts at writing our curriculum but it is compartmentalized and so what I have been doing… (initiation statement)

Finally, *statements of rejection* were when one individual did not agree with another member's clarification. In Session Six, the members were talking about having access to computational facilities and services for the students.

> Janice: at (another university) they have over 1000 old computers and they linked them together almost like a brain center. Different instructors give access to their students and then through the network you can access the computer of all these machines.
>
> Jack: it's not hardware that is a problem, it's personnel that's really a problem (rejection statement)

I added an additional code to communication for interruptions. I defined an *interruption* as a break in the flow of the conversation. Each utterance was coded for topic and type of communication, and in some cases, also as an interruption. For example, in Session One, the issue of grading teaching assistants was discussed briefly before the members in the community of practice tabled it for a future session:

> Shelley: I can't believe, I mean, if this person tried, were there times when you met with this person to discuss ways in which they could improve? (teaching and asking for clarification utterance)
>
> Keith: well, I (teaching and clarification utterance)
>
> Justin: (interruption) hey, Shelley, this person had every opportunity in the world (teaching and rejection utterance)

All utterances of communication were coded regarding topic and type of communication, as well as interruption when appropriate. The communication was then analyzed in several ways.

3.1.3.3 Group communication

I first analyzed the frequencies of topics and types of communication as well as interruptions in communication, by individual characteristics. This analysis provided evidence of power related to interactions within the community of practice, and the extent

to which participants engaged in discussions about Teaching-as-Research and other topics. Next I reviewed the group transcripts and coded extended interactions for norms and values espoused and the relative power expressed. Finally, I compared any patterns derived from my analysis of the interviews and observations to derive the working propositions about the relationship between individual characteristics, group characteristics, sensemaking, and change in individual professional identity (Yin, 2002).

Chapter Three described the research design and methodology used in this research study. Chapter Four will provide characterization of the group members, and the individuals' perceptions of their professional identities. In addition, Chapter Four provides a detailed description of the twelve group sessions observed and a discussion of the topics and types of communication.

Chapter 4

The Community of Practice: Members and Sessions

Chapter Four provides an overview of the participants and sessions in this study. Community of practice members' individual characteristics are described, including rank, gender, ethnicity, experience, and professional identity as self-reported in the initial interviews. The group sessions are reviewed, and details are provided about the topics and types of communication that occurred during the twelve sessions I observed.

4.1 The members of the community

This community of practice began meeting 14 years ago to discuss undergraduate education. During the semester I observed their sessions, three participants taught the introductory level courses; two of them were tenure-ineligible instructors, and the third was a full professor.

Three other faculty members in the department taught one of the two introductory courses; they were on the tenure-track, but were not members of the community of practice. Perhaps their hesitancy to attend meetings about teaching was related to their focus on research in order to earn tenure at a research university such as Woodland where teaching takes second place to research. In many research universities, tenure-line faculty members - especially those who have not yet attained tenure - are strongly encouraged to focus on research at the expense of teaching. A professor who is on the tenure track will

gain more rewards from research conducted than from undergraduate teaching (Tierney & Bensimon, 1996). While teaching is one piece of the tenure evaluation, the assessment is based on student evaluations with no real agreement as to what good teaching is. This lack of agreement on what makes for good teaching reinforces the lesson that it is not important; if it were, there would be clear guidelines as to what constitutes good teaching (Tierney & Bensimon, 1996).

Of the thirteen members of the community of practice, five were tenure-track faculty members; however they all successfully reached full tenure status prior to becoming involved in the community of practice. As one of the emeritus faculty stated during his initial interview,

> I became involved in the group when I retired. I no longer had to keep up a facade of being just a researcher and keeping the rest of the secret. It came out anyway, because I would get teaching awards…

4.1.1 Individual characteristics

The thirteen participants included three emeritus professors, two full professors, and eight tenure-ineligible faculty members (five lab directors and one post-doctorate). The gender composition was eight males and five females. All of the participants were Caucasian; therefore, ethnicity will not be a focus in the discussion of how the individual characteristics of the participants affected the interactions within the community of practice. The level of experience for the thirteen participants ranged from one to 43 years. For this study, experience was defined as the number of years each participant had spent teaching undergraduates after receiving his PhD. Table 4-1 illustrates the demographic and professional characteristics of the participants.

Table 4-1: Individual Professional Characteristics

Rank Emeritus: 3 Full professors: 2 Tenure-ineligible: 8	Gender Male: 8 Female: 5
Ethnicity Caucasian: 13	Experience Less than 10 years: 5 10 to 20 years: 3 21 to 30 years: 1 31 to 43 years: 4
Professional Identity Teacher: 6 Researcher: 1 Integrated Professional: 6	

4.1.1.1 Initial Professional Identity

During the first interview, participants were asked to identify themselves as primarily teachers, primarily researchers or as integrated professionals (those who purposefully combine their role as both a teacher and a researcher). Six of the thirteen participants identified themselves as primarily teachers, one individual identified himself primarily as a researcher, and six identified themselves as both teachers and researchers.

Of the participants who identified themselves as primarily teachers, one was an emeritus professor and the five were tenure ineligible faculty members; three were male and three were female. The individual who identified himself primarily as a researcher was a full professor. Of the six who identified as both a teacher and a researcher (integrated professionals), three were full professors and three were tenure-ineligible

faculty members; four were male and two were female. I used ideas from Posner (1995), Boyer (1990), and Colbeck (1998) to explore various aspects of teacher identity, researcher identity, and integrated professional identities respectively, keeping in mind that these are only a few examples of how to define professional identities.

4.1.1.1.1 Teachers

During their initial interviews, the six participants who identified themselves primarily as teachers all expressed an interest in whether or not their students were learning (understanding) and how best to teach the students the information they needed to know. Thinking about the best teaching approach, making sure the students "get it", and communicating well were all descriptors they used to describe teaching.

Five of the six participants who identified themselves as teachers were tenure-ineligible faculty members and all had less than 15 years of experience. Their primary responsibility was teaching, and three of the five were also responsible for directing the laboratories in their specific discipline.

I reviewed the interview responses from the individuals who identified themselves as primarily teachers and compared them to the curricular perspectives described by Posner (1995). Although the participants provided details about what being a teacher meant to them, I was unable to categorize their responses using Posner's (1995) perspectives because they did not concur with his specific definitions. Teacher identities do not exist in pure forms; rather individuals hold various combinations of teaching philosophies or curricular perspectives (Stark and Lattuca, 1997). Therefore, I analyzed

participants' descriptions of their own identities and found three groups of similar explanations: helping students develop knowledge, listening to students, and providing support.

Three of the participants who identified primarily as teachers talked about how important it was to them that the students were learning and developing knowledge. A male tenure-ineligible participant said, "this is everything to me; to be able to help the students and watch their development…" Another male tenure ineligible participant stated, "it is important to provide a professional role model for students at this level; to teach them ways to learn and how to be good students. One of my strengths is my willingness to work with students until they understand concepts." The emeritus faculty member who had achieved full tenure status said, "I really care about whether or not my students understand what I am trying to teach. I try to get them to see things the way I see them." When he talked about his research, he stated, "My professional development was slower than others, due to my publications." During his initial interview he made it clear that teaching was always his primary focus and remained so.

Two of the participants who identified themselves as teachers talked about the importance of connecting and learning with the students. One of the female instructors stated,

> Being a good communicator, finding ways to connect with the students and connect to what they already know so we are all on the same page; that is important. I recognize that people learn differently, at a different speed, so you may have to do a number of things to get a point across.

Another female tenure ineligible participant stated, "I keep listening to the students and learning with them. If I am not learning, then I stop being a good teacher."

Finally, the sixth participant, a female tenure ineligible faculty member answered

> It means a lot of responsibility. It means presenting myself well, being professional, and trying to be as optimistic and supportive as possible, having students understand what I am teaching them.

4.1.1.1.2 Researchers

There was only one participant in the community of practice who identified himself as primarily a researcher. When talking about his teaching, he stated, "I don't view myself as a particularly good lecturer." However, when discussing research, he stated he was happy to be at a research university so he could engage in his research. "I am very interested in how things work…I work very hard and am persistent in my research."

During his initial interview this participant said that he "got into teaching and the academic life so I could continue learning myself and doing research." This approach to research is similar to the scholarship of discovery described by Boyer (1990). This participant was "interested in how the stuff works…discovering new things" and to keep learning. Boyer identifies the characteristics of an individual who engages in the scholarship of discovery as invested in pursuing knowledge for its own sake. This participant said,

> There is an experiment we have been working on for a number of years and we were struggling until we got to a point this past summer where it was producing nice data and I created a fairly large program to analyze the data and that is always rewarding…when something gets completed and it turns out well.

Boyer also stated that the research of faculty members at research universities, such as Woodland University, is more likely to focus on scholarship of discovery than that of faculty members at other types of institutions.

4.1.1.1.3 Integrated professionals

The six participants who identified themselves as both teachers and researchers were a mixed group. There were two with less than ten years of experience, one who was in mid career, one towards the end of his career, and two who had already retired. There was also a range in their academic rank, from emeritus and full professor to tenure-ineligible faculty members.

Two of the tenure-ineligible faculty members described the relationship between teaching and research in terms of applying research skills to teaching and learning. One talked about being a teacher and a researcher of student learning. “When you’re doing research in education or even in the sciences… you have to understand how people learn in very different ways.” She described herself as an educational researcher and that she was “excited about helping young people to learn science more effectively.” The other had difficulty stating whether teaching or research was more important. Instead he told me,

> I don’t really draw a distinction in my case. My picture of teaching is I want to be confident that students advance and grow and learn and the research is trying to adjust the system to make sure that happens better and better. Research in a sense, is “how is the classroom environment?” and if it is not what it could be or should be, what is broken and what needs to change to improve it.

The third tenure-ineligible faculty member who identified herself as both a teacher and a researcher talked about how her research and teaching interact

> To be able to make some new discoveries, to make some new compounds that have never existed before (excites her), to accomplish things and then communicate this with others. Whatever research I am doing, I think of how I can apply this to my teaching; how can I teach students better so that they will be more research oriented?

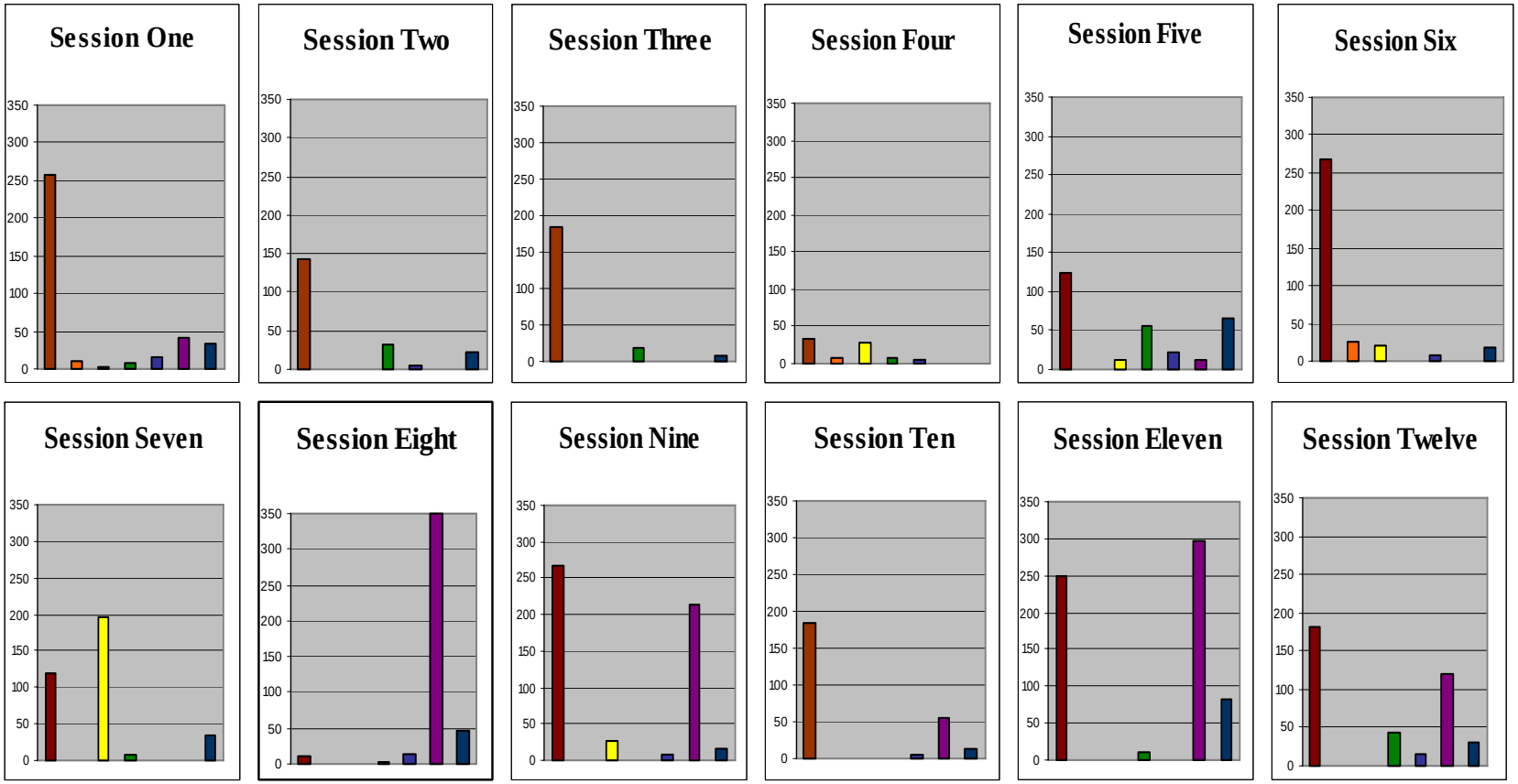
Older, tenured faculty members described about teaching and research integration in terms of how laboratory research and classroom teaching are two separate activities that enhance each other. One stated, “I could never have been a very good teacher without being a researcher.” The other said, “Teaching has enhanced my research in the sense that I can present ideas more clearly.” Yet a third stated, “research and teaching are two compartments of my life.” However he also stated that, “my research does not inform my teaching; rather the other way around.”

4.2 Community of Practice Sessions

I observed twelve sessions of this community of practice over a period of one academic semester. The group typically met for an hour over lunch, although the starting time varied depending on when a majority of the thirteen participants arrived. Three of the thirteen attended all of the twelve sessions I observed; however, all of the members of the community that are included in this research attended at least seven of the twelve sessions. Figure 4-1 depicts how the topic of communication fluctuated from one session to the next. In addition, there were topic changes within each session. A description of each session illustrates changes in topic and type of communication within and across

sessions. Appendix F contains a breakdown of the topics and types of communication for each session, as well as the total for all twelve sessions.

Figure 4-1: Total Topic utterances for each session



4.2.1 Session One

The topic of conversation in the first session was mostly about teaching (258 out of 372 utterances). The discussion started with a brief logistical conversation (16 out of 372 utterances) about an additional meeting some of the participants would be attending later in the month. After a majority of the group members were present, the conversation quickly shifted to a discussion of how to place students in the most appropriate class based on ability. Conversation ensued related to placement testing and whether or not the testing was accomplishing the goal set by administrators

> The size of that number (students trying to drop out of a higher level class and enter a lower level class) is a direct measure of the failure of the testing and advising process university wide…
>
> That's correct
>
> …University-wide because there, to the first approximation, almost none of those students should have been in (specific class) in the first place

As the conversation continued…

> Yeah, but part of the reason they aren't getting into (class name) has to do with the University setting up the placement testing the way it is and the advising. so they're not, it's not entirely their (the students') fault
>
> We need to have an advisor education. I mean, if it's science, it's…
>
> But whatever we come up with here has got to get out to the advising offices

During this discussion, several of the members made off-task comments, some of which related to their being observed by the researcher ("so she will have to sign a consent form.") Three utterances coded as TAR during this conversation. These Teaching-as-Research statements related to a placement test given during a class meeting in the introductory courses at the beginning of the semester, and whether or not this process helped place students in the appropriate level of study. Another teaching issue was raised regarding graduate teaching assistants, but this topic was tabled for a future session. The session ran for 1 ½ hours (they are scheduled for one hour), with members lingering in the room talking with one another.

One administrative issue was discussed toward the end of the session; the purchase of a used piece of equipment for the laboratories. The group members talked about various ways to secure the funding for the purchase and delegated one member to take the lead on this initiative. This conversation consisted of 42 of the total 372 utterances.

The type of communication demonstrated during Session One was mostly clarification and involved 143 of the total 372 utterances. There were also some questions asked in response to the clarification statements (55 of 372) and some utterances that involved accepting an idea (42 of 372) that someone else had presented.

4.2.2 Session Two

The second session lasted one hour, and was focused primarily on the topic of teaching. Of 205 total utterances, 144 were related to teaching. The session began with

several members talking about students deciding to enroll in their courses after three weeks of the semester had already past (19 teaching utterances). Others in the group shared personal concerns (coded as off-task) such as flooding from recent rains (10 utterances). The discussion then shifted to inviting a new stock room staff hire in the department to join the community of practice. This conversation was coded as procedural since it related to the functioning of the group (32 utterances out of the 205 total). Members talked about various ideas for making her feel welcome, such as buying flowers and a card (9 statements coded as off-task). After the decisions were made on gifts for the new stock room staff, the remainder of the session focused on teaching.

The group spent half of the hour discussing a curricular issue: whether or not to continue offering the freshman seminar for students in science during the spring semester or change the seminar to the fall.

> I guess October 6 is teaching assignment day, for the curriculum committee, one of the obvious things some people thought about was switching (freshman seminar) to the fall from the spring
>
> Some of the pros for the spring are, the students you have as declared majors in the spring are actually going to stay as majors, if you have it in the fall, you have got a bunch of students taking it who are not going to be majors. Another factor is doing it in the spring, makes it a little easier for them to understand what's going on, if you tour them around, have them visit some labs, it just seems that particular exposure is more suitable that semester. Another factor is, there is a tendency for some of the first year seminars to focus on how to be a good student, and it's offered in the first semester and that's when the students are getting adjusted and getting their study habits adjusted and all that and in my opinion
>
> How many majors or intended majors do you actually lose from the fall or pick up in the spring?

> I would add at least one more reason for leaving it in spring semester, I think in fall semester, the freshmen are getting hit with a lot of orientation stuff and I think that for the kind of course we run they're really more prepared to absorb the information and integrate it into their thinking by the time they're second semester so I think I'm in favor of leaving it in the spring semester as it is.

There were 52 of the total 84 clarifications for this session related to this teaching issue, and 32 questions addressed those clarifications. The members of the group expressed their own preferences about changing the semester when the course should be offered; five utterances were coded as rejected ideas and seven accepted ideas. No final decision was made regarding timing of the freshman seminar during this session. The decision was tabled for two reasons: the meeting time had expired and many of the members were leaving, and the instructor for the course was not present during this session.

4.2.3 Session Three

During Session Three, a visitor from another research university came to talk with the community of practice. Initially, she was going to introduce the concept of Teaching-as-Research to the members; instead she presented a case study from her university regarding curriculum changes over the past few years. This session lasted more than an hour. There were only 210 utterances by community of practice members; I did not code the statements made by the visitor.

I coded the topics of communication for Session Three as procedural (19 utterances), off-task (seven utterances), and teaching (184 utterances). Statements coded as procedural or off-task occurred at the beginning of the session. Procedural utterances included when the group members introduced themselves to the new member and the

visitor. The off-task utterances were related to the cake that the group enjoyed as part of the welcome to the clerical staff member.

Teaching utterances focused on three topics; general curriculum issues (six of 184), a new degree program to be offered by the college and related course requirements (123 of 184), and conversation with the visitor (55 of 184). The following is an example of an exchange regarding the new degree program between a few of the group members,

> Do they have a quantitative course order? That would have to be in place. For someone to take, what would be a prerequisite for your (specific level course)?
>
> Well, I think that most (employers) require this and would have to have a quantitative course
>
> So, that must be an eventual goal of the (new degree program); to offer a quantitative course, because you won't get hired for the (job) without that course
>
> Well, we don't have a quantitative course right now, but we can certainly provide a lab with the thought in mind that whatever the lab is, it will prepare people for this major as well as for our own majors

The types of utterances coded as teaching were either clarifications (98 of 184) or questions asking for more clarification (49 of 184).

4.2.4 Session Four

An individual who is involved in CIRTL research regarding Teaching-as-Research presented the idea of Teaching-as-Research to this community of practice during Session Four. She provided participants with an overview of Teaching-as-Research and discussed its relevance to their field. As with Session Three, I did not code

the statements made by this visitor, so the total utterances coded for Session Four were 80. The session began 15 minutes late and lasted only one hour.

The topic of communication for Session Four focused primarily on teaching (33 of 80 utterances) or TAR (28 of 80 utterances). The members of the community of practice had the opportunity to ask questions regarding Teaching-as-Research and engaged in some small group activities. When members of the group shared certain teaching techniques that they used or had used in the past, I coded these statements as teaching. The presenter talked about differences in student ratings when using alternative instruction methods. One of the group members engaged in a conversation about the difference

> Is there that big of a difference between the two courses, one where you use PowerPoint and one where you don't?
>
> So, you don't use it, but you are recognizing it as a possible solution. (talking to another group member) Do you post the PowerPoint presentations before class so that the students can download them and have them?
>
> Some people do, and some don't…
>
> I post them a couple of days ahead and I always undo all of the links at the beginning of the semester and then redo them and if it doesn't change, fine, but it always changes so…

Later during the session, the group members continued talk about their use of PowerPoint and handouts

> When I put something on the overhead, the students will write exactly what's on the overhead. I can talk faster when I use overheads. That's why I use this great big chalk. The students have to read it, they have to write it. They learn more by having to write something…
>
> What I find with overheads is that I leave lots of blanks so I might have the problem typed but I leave room so I can solve the problem on the

> overhead. I think the more you make it active, the more you work questions in and it definitely makes a huge difference

TAR utterances focused on changes participants had made to their courses based on feedback from their students, different evaluation tools they were using currently, and specific questions they asked of the visitor. During this session, there was only one utterance coded as off-task; a group member made a comment about people wanting to attend the sessions because the members are appealing (attractive).

Most utterances involved clarification (37 of 80) or asking for clarification (11 of 80). When the participants changed the subject and provided information regarding their own teaching, I coded these 12 statements as initiation.

4.2.5 Session Five

Session Five began fifteen minutes late. One group member asked if they were waiting for a particular member before they could “officially” start. The session began with a conversation regarding the medical status of the administrative assistant in the department. She had been sick and the group discussed sending flowers, a cooked meal and other options to let her know they were thinking about her. This conversation was coded as off-task and accounted for 65 of the total 290 utterances for this session. The group decided to send flowers and a card, and requested that the observer take a photo of them to include in the card they sent. This activity accounted for fifteen minutes of the total group time.

During the remaining 45 minutes, the group discussed the focus they might take for future sessions. One vocal member of the group initiated conversation regarding the

discussion of Teaching-as-Research that occurred during Session Four, and proposed that the community of practice could dedicate time during some of their meetings to talk about teaching. He stated that Ben specifically suggested that Donna share with the group curricular changes she had made based on student feedback. Ben never stated this during any of the sessions, so I surmised that this conversation took place outside the sessions I observed. The same vocal individual also acknowledged that there were policy and administrative issues that they needed to focus on as a group. A lengthy discussion regarding curriculum issues (54 utterances coded as teaching) followed the brief procedural conversation (7 utterances).

> …Getting control of the basic curriculum
>
> The same thing is happening in (specific course). Eric is teaching a completely different course than has been taught by everybody else for the last ten years. Whether that's a good thing or a bad thing, it's certainly different.
>
> So here's my two pronged plan. First, figure out where we're at by nailing down the 400 word descriptions for the courses we are currently offering and that begins to address some curricular issues such there be a prerequisite for (certain course) or can it be taken separately?
>
> So this is where it starts to get complicated. The second thing is I think we're in general agreement that the curriculum committee should not attempt to micromanage our courses but that we should focus on the major and that (the descriptions) that's a more management problem. I think a much more appropriate and possible to be tackled by curriculum committee than the fifty majors and many myriad other kinds of problems that come up the moment you start talking…
>
> …And I think it really focuses on the students too. We need to focus on that issue in a lot of ways.

For the remainder of Session Five, the topic of communication fluctuated between procedural issues and teaching concerns. The group concluded with a lengthy discussion

of when to begin the meetings because several of the recent sessions had been delayed at least fifteen minutes until the majority of the members were present.

> …Lunch at 12 and business at 12:15?
>
> You want to say, by 12:15 be here?
>
> I didn't know why people came at 12:15, I mean…
>
> …Because they came at 12 and they don't get around to buying their lunches until 2 minutes to 12.
>
> But then if we say business at 12:15, then people will be here at 12:30.
>
> Right, that's what I was going to say.
>
> Exactly.
>
> That's why I think we shouldn't say it

The types of communications that occurred during Session Five, other than the off-task utterances, were clarification (119 of 290), asking for clarification (28 of 290), modification or revising an idea (21 of 290), and acceptance of a stated idea (22 of 290). There were also eight utterances that I coded as rejections of ideas, and they involved teaching and procedural topics of communication. An example of a rejection related to teaching was: "we can't tailor a program based on a few anecdotal stories…" A rejection of a procedural topic was "I don't see the advantage."

4.2.6 Session Six

The overall theme to Session Six was the strategic plan for the department. There were 342 total utterances made during this session, and 268 of them related to teaching in the context of the strategic plan. The individual responsible for writing the plan asked

specific members' questions about their courses (coded as asking for clarification) and I coded the responses as clarification. Other types of teaching utterances included substantiating and modifying statements regarding teaching and courses offered.

> Are we writing the strategic plan?
>
> I am glad you asked that. This is really an update and I don't think anything grandiose is required…my thought was to basically update the comments that were put in there in the department plan and talk about other things that aren't really addressed, so I was going to ask people for some specific things…
>
> One of the areas I think we need to address the professional master's degree and what's been done there
>
> There are some things like the expansion of the curriculum and integration of lab and lecture. I was going to mention the TA coupling of (several classes) as one of the things that's new. Is there, have we actually done anything in terms of coupling lecture and labs in terms of higher level courses?

In addition to the communication related to teaching, research and Teaching-as-Research were also topics of conversation (27 utterances and 21 utterances, respectively). The communication related to research focused on undergraduates involved in a research project, and the Teaching-as-Research conversations related to educational research in conjunction with other colleges at the university. The session ended with a conversation about football, parades, and politics; all coded as off-task utterances.

4.2.7 Session Seven

During Session Seven, Donna discussed changes she made to a course based on student feedback. Outside the community of practice meetings, Ben had suggested that she present this information and then during Session Five, other members of the

community of practice reinforced this suggestion. The majority of the communication that occurred during this group focused on that discussion. There were a total of 359 utterances during this session.

At the beginning of the session, a personal conversation coded as off-task involved 27 of the 35 off-task utterances for this session. The conversation changed to topic of teaching (120 utterances) and TAR (195 utterances) as the course changes were discussed. A sample of one of the discussions regarding teaching is:

> So, this is a graded assignment for the students?
>
> …It is a graded assignment…
>
> So it's one more assignment and they have to take it seriously and they do it early?
>
> I have seen nothing from these students that tell me that they have gained any insight from what they've done. I just graded a bunch of reports and it's really pathetic and maybe that's probably a result or a reflection of my teaching, but I just see these students doing the bare minimum and they don't care about how they present themselves in writing. Their grammar and spelling is just atrocious and they just give you the bare minimum, its pure description there's no insight in any of their answers whatsoever.

A partial conversation regarding Teaching-as-Research focused on feedback.

> I do have an example of an experimental in the lab guide itself so when students say well I didn't really look at the manual I looked more at the example there was confusion there, which again is another wrinkle I have to iron out for next year. But at least I think this assignment was beneficial for them getting their writing up to a certain level.
>
> After the discussions we had about teaching as research this is absolutely right along that line, bringing the research lab and the publication of original results closer together with a classroom exercise environment to enrich the student's environment and that's a great thing.
>
> I think they found it beneficial
>
> At the end of the year when you have them do evaluations, you do have a question that asks specifically what they thought of that (assignment)?

Right

There were also nine procedural utterances related to group members presenting information in upcoming sessions.

The types of communication during Session Seven varied. Almost half of the total utterances (170 of 359) were clarification statements. Fifty-four utterances asked for clarification. Other types of communication included 31 utterances that accepted an idea, 20 substantiations (offering evidence), and 16 modification statements (revising an idea). The individual who presented the information about her course made 89 of the total 359 utterances. This contrasts with her participation in other sessions she attended; her utterances ranged from less than 1of 342 to no more than 16 of 423 of the total utterances for each session.

4.2.8 Session Eight

Session Eight began with an update about the old stock room and moved on to an in-depth discussion regarding newly available rooms in the building. Some of the research faculty had moved into a new building and this opened space that the members of the community of practice wanted to renovate for the undergraduate students in their department. There were a total of 423 utterances during this session, and 351 of them were administrative. One segment of the conversation regarding renovations involved finances.

> I asked Justin for a few moments to just update you on what's happening with the old stock room on the first floor and this is not completely to scale (hands out drawings) I photocopied the plans, and the stuff I drew in, to let you know where we're at and where I think we're headed. This is a

> new venture and I am not completely sure we are headed in the right direction so I kind of wanted to let you know where we're at but feel free to tell me…
>
> Exactly, so we spent some money not very much as it turned out (gives details of room changes) so the original estimate was $17,000 based on what was done in (another room). This turned out to be much less, I haven't seen the actual number but they were throwing around numbers around four or five thousand dollars and maybe close to $3000. It's somewhere in the three to five thousand dollar range.
>
> So who did the work?

There were 46 off-task utterances that occurred throughout the discussion about the renovations. Other topics of communication during Session Eight were coded as teaching (10), logistical (13), and procedural (3). All of these utterances were somehow related to the overall conversation about space. For example, an utterance I coded as teaching was about having peer tutors for classes available in the renovated space.

The types of communication that occurred during this administrative conversation included clarification, which accounted for almost one half of the total (206 out of 423). The other types of communication that occurred somewhat frequently were asking for clarification (53 out of 423), modifying or revising an idea (28 of 423), and accepting an idea (55 of 423).

4.2.9 Session Nine

There were two major topics of communication that occurred during Session Nine. Of a total of 535 utterances, 268 were teaching utterances and 214 were coded as administrative. There were also 27 utterances coded as TAR.

The conversations related to teaching focused on issues such as a student who was seeking help from several members of the group, how to connect students new to the major with current students, setting up a formal mentor program, and annual teaching award nominations. Snippets of the conversation regarding the student who was hoping to receive assistance from the group members related to the student working in a study group.

> (Name) is coming to talk to me this afternoon, I am going to tell her how to make up the lab.
>
> That's going to take me a lot of time I am already behind with the participation. If they are going to do it right that is what we really should be doing but…
>
> Well, I think that just to make…
>
> …She was just in my office.
>
> I told her, she should be studying with a group of people. I asked if she has a study group, and she said no. I said get yourself into one.
>
> I told her the name of somebody I thought was taking the course or I told somebody else about her one or the other I tried to get her hooked up with somebody.

The administrative discussions related to the open space discussed in Session Eight how to present the community of practice's plan to the administrators, and budget issues such as purchasing new equipment. When the group talked about presenting their plan to the administration, they discussed having students involved in the presentation.

> So the tactic we are using to try to change this is, that we've got a meeting set up with the Dean and the Associate Dean and three of us, we are not sure exactly which subset of us and several committed undergraduates to make the point that the (extra space in the building) needs to be an undergraduate space and therefore…
>
> …(Student's name) would be good.

> …What we're going to do is sort of dare the Dean to look the students in the face and say no, undergraduates don't matter…
>
> Right, she's the one.

The Teaching-as-Research communication occurred toward the end of the session and related to a member presenting results from an online mid-semester survey that she had administered to students in her class.

The types of utterances that occurred during Session Nine were mostly clarification (355 out of 535), or asking for clarification (89 out of 535). There were also more statements that were coded as accepting an idea (55 out of 535) than in previous sessions.

4.2.10 Session Ten

Session Ten focused mainly on the topic of teaching (185 of the 259 utterances). A large part of the conversation related to an issue raised during Session One; grading graduate student teaching assistants.

> (After a brief discussion of using pass/fail grades)…Part of me really wants to retain using letter grades because there is no doubt in my mind that the new TAs need some motivation.
>
> It's good that the students get a letter grade but it is hard work for me. Now if the rest of us had to choose which side to fall on that, we say, go for the letter grade.
>
> I don't see a problem with sticking with letter grades but I think we need to have clear guidelines among ourselves as to what the criteria are…we need to figure out how we're going to assign grades that have some semblance of fairness.
>
> What brought it up?

> One of the main things that started the discussion was giving grades that are too wimpy and I think that's the thing we need to worry about. If we give grades that are Bs and B+s to TAs that are really substandard…

Other teaching conversations included a discussion of the new major scheduled to be offered the following fall, and a summary of the meeting between new and current students (discussed in Session Nine). Another follow-up conversation was coded as logistical (five utterances) because it related to an outside meeting some of the members attended, and had been previously discussed in Session One. There were also conversations about administrative issues (55 utterances) such as storage space for various reference books that members of the community of practice would like housed in a common area, and the best security to use to ensure limited access to rooms that housed equipment.

The types of communication that occurred in Session Ten included initiating a discussion of a particular topic (20 out of 259), the development of an idea (clarification) (134 out of 259), asking clarifying questions (35 out of 259), and accepting another's idea (23 out of 259).

4.2.11 Session Eleven

During Session Eleven, there were 640 utterances, more communication than occurred in any of the twelve sessions. The next most vocal was Session Nine when there were 535 coded utterances. An overwhelming majority of the Session Eleven utterances either involved teaching (249) or administration (298). The rest of the utterances were either procedural (10 of 640) or off-task (83 of 640).

The communication about teaching during this session involved discussions of curriculum changes and an in-depth discussion of online teaching resources and the course management system. One of the participants spoke at length about her experience with the course management system and how she was using it to post some assignments and for grading. She also talked about how she was encouraging her teaching assistants to access this resource.

> There are definitely things in (the online teaching resources) that we can use and I think would be an improvement. Principally the grade book and the surveys can be done much more effectively
>
> I'd like the grade book because Donna and I are always looking at our students' grades.
>
> That's a good indicator of how the grading is going, how a lot of things are going by just looking at those grades in that grade book. I have asked the TAs, and I pretty much have to ask all the time, can you send me your new grades, and it's a pain in the butt.
>
> It drives you crazy, but if you just teach them at the beginning of the year how to enter into the program… now again, I don't know how hard it's going to be to learn that.
>
> Are there formulas you can put in the grade book?
>
> I am assuming that you can.
>
> And then those grades can be sent to the student instantaneously too.

The conversation about administrative issues focused once again on access to unused space in the building. Several members of the group had met with college administrators in the college, and reported to the rest that they had tentatively been granted use of the space. This precipitated a lengthy conversation about how to use the space, monies that would be needed for renovations, equipment to be housed in the rooms, and how to ensure security.

> There is no real news here. We were talking to the Associate Dean about the renovations and the original intent I had for the meeting was to ask how we leverage the new major to get money from University administrators to do that, and what I got from him was that he thought that the College could do most it. The Dean might want to ask the administration for money but that the Associate Dean thought it was a worthwhile project. He was not sure about how committed the department was, he wanted to talk to some of the others.
>
> Yes, especially since we've already had to spend $30,000 on a facility issue.
>
> So that's just part of waiting and Eric will just give him a revised plan. I guess one concern the Associate Dean had was that electricity in this building might be a problem that there is a lack of enough electricity.
>
> We just spent a third of a million dollars in the early 90s upgrading this building's electricity.

Procedural utterances took place primarily at the beginning of the session and focused on change in the meeting space for this session, and how the group might be interested in continuing to meet in the room. Off-task communication occurred throughout the session, and related to personal issues such as the food one member was eating, the dessert another shared with the group, and general gossip.

The types of communication evident during Session Eleven were quite varied, including clarification (270) and also more verbalization of ideas being accepted (88) than had been present in previous groups. A number of ideas were rejected (22). Other types of communication included: initiation of various topics (16), asking for clarification (59), substantiating ideas (28), modifying thoughts or ideas (58), and synthesizing ideas (11).

4.2.12 Session Twelve

Session Twelve was the last session I observed of this community of practice. It occurred close to the end of the semester and seemed to wrap up several ideas discussed in previous meetings. There were 391 utterances coded for this session. The topics of communication included: logistics (16), off-task (30), procedural (44), administrative (120) and teaching (181).

Three topics of communication comprised a small amount of the total group utterances. First logistical communication related to a committee meeting that involved some of the group members. The off-task communication focused briefly on the last session for the researcher, and various jokes made throughout the session. The procedural communications were conversations about the option of changing the day and time for the community of practice to meet during the next semester so that certain members could attend more consistently, and the possibility of having professionals from other universities or organizations present to the group via conference calls.

The administrative communication involved purchasing or borrowing equipment for conference calls (45 out of 120 administrative utterances). The group also talked about monies for purchasing other office equipment such as a copier.

> There was one other thing that is also pretty trivial and that had to do with the copier. I did find out about that and I don't know if I have the information with me but that will be unplugged come Jan 1.
>
> Basically that's a rental unit and the cost is about $4000 for some period. Basically it works out to be 1.3 cents a copy if you make a lot of copies. From January to June it's going to be $2000. It's not something that we own, I don't know if there's a real need to have another copier or not.
>
> Are we talking about in addition to this one?

> Yes.
>
> An extra $4000 a year compared to walking down the hall doesn't seem like much of a choice.
>
> No there was the question of whether we owned that and could bring it over and the answer is that it's leased. I guess because there is no one other than Fred over there, it won't be continued past the end of this year.

The topic of communication that occurred most frequently during Session Twelve related to teaching. Specific program issues were discussed and a lengthy conversation about new ideas for the freshman seminar (discussed in Session Two) occurred.

> I was going to pose the question that freshman, First Year Seminar it was started 10 years ago or more, way before the university made it a university-wide requirement. I don't ever remember this group having had discussions about or brainstorming about what kinds of things might be useful our students. But now I am teaching both sections of it in the spring this time.
>
> Well, it always involves having students bring in the Science Times once a week.
>
> Anything that has any (subject matter) relevance or magazines. Trying to link science to current events.
>
> Even though this is at the end of the semester, why not have them attend the poster session?
>
> That's a great idea.
>
> Well one of the things that I didn't mention that I have typically done every spring semester is have them go to the lectures or whatever is going on and then write a little paper about it often which says I didn't understand anything I heard but what the speaker was trying to tell me was…
>
> Having a discussion afterwards is much more effective, so I have done that the last couple of years.

At the end of the session, several of the members also discussed an article in their professional journal related to teaching.

The types of communication that took place during Session Twelve varied greatly. There were 197 utterances that related to clarifying an idea, and 43 utterances made requesting more clarification. There were 45 statements that accepted an idea, 20 involved initiation of an issue, and 20 that modified an idea.

4.3 Changes in communication

The topic of communication during the twelve sessions changed from week to week, and within sessions. I observed that whenever a participant had an issue that they wanted to talk about, the group addressed it, and the topic of communication would change. The communication was free flowing, and any one member of the community of practice could redirect the topic.

4.3.1 Changes within sessions

The topic of communication changed within sessions to varying degrees. During some sessions the members changed topics frequently, and during other sessions, the topic of communication remained fairly consistent. For example, during Session Five, the group members spent a great deal of time in off-task communication regarding the health of the departmental administrative assistant. The conversation then moved to the logistics of the group, then to teaching issues, and still again to procedural concerns regarding meeting time. In contrast, during Session Eight, the topic of conversation was fairly consistent and most of the time was spent on administrative issues.

4.3.2 Changes across sessions

I compared the twelve sessions to determine if there were any patterns of change in the topic or type of communication that occurred. I found that while there were changes in topic, the types of communication used across the sessions were fairly consistent.

4.3.2.1 **Changes in topics**

A review of the topics of communication during the twelve sessions showed that there were two major changes in topic across sessions. The major changes in the topic of communication across sessions occurred with the number of Teaching-as-Research utterances and those related to administration. Table 4-2 indicates that while the number of Teaching-as-Research utterances was small during Sessions One through Three and Sessions Eight through Twelve. During Sessions Four through Seven, however, almost one-fourth of the utterances were related to Teaching-as-Research. In contrast the utterances related to administrative issues were minimal during Sessions One through Seven, but comprised almost one-fourth of the utterances during Sessions Eight through Twelve.

Table 4-2**:** Communication Topics

Topic of Discussion - % of total Utterances				
TAR			Administration	
Sessions 1 – 3	Sessions 4 – 7	Sessions 8 - 12	Sessions 1 – 7	Sessions 8 – 12
.1%	23.9%	1.2%	1.3%	25.3%

During Sessions One through Three, communication that reflected Teaching-as-Research involved issues related to whether students were enrolled in the appropriate courses and the impact that placement testing had on course assignment:

> But we had no way of knowing how many students it would drive into (course name)" and it turns out in retrospect that those two sections should not have been closed…

After the fourth session, there were some conversations related to what one member termed "educational research," for example,

> Are there any people who have had some sort of distinguished research careers who are now turning their focus towards education and wanting to do more educational research?

In Session Seven, 195 out of 359 utterances were about Teaching-as-Research when Donna presented and the discussion focused on what she had done for her class. She gave the students data from actual experiments and required them to use this data for their assignments. The changes she made were based on student feedback. The members of the community of practice made suggestions about gathering student feedback ("At the end of the year when you ask students to do evaluations, add a question that specifically addresses what they thought of that…"), specific questions about grading ("Does this get a grade based on structure or does it include grammar and spelling?") , and several supportive statements to the changes she discussed ("The way she has done it, she's been able to pick and choose good examples that made the right point for the right reason.") During the remaining five sessions, the only utterances related to Teaching-as-Research occurred in Session Nine. The 27 Teaching-as-Research utterances (out of the total 535

utterances) during Session Nine involved one of the members presenting the results of an online survey that she had administered to students in her class.

The frequency of utterances about the topic of administration greatly increased during and after Session Eight. During this session, the members began to discuss their plan to present how to use newly vacated space in the building to the administrators of their college. There were 351 out of 423 utterances (83%) about administration in Session Eight.

An example of an administrative utterance prior to Session Eight was part of a conversation that focused on purchasing needed equipment for the labs:

> How is the donation system around here? Do you have to compete with big companies to bring in systems to be donated or do they just sell off the big instruments?

During Session Eight, the community of practice began focusing a great deal of the conversation on the space they hoped their department could acquire from the college:

> Well, it's a mess in there right now because what is happening is there are bunches of graduate student cubicles in there because salvage is so far behind. They are like a month behind, and so they still haven't taken away the stuff in that room.

During his final interview, one of the emeritus faculty members indicated this shift in the community of practice's focus to administration was becoming the norm:

> A development that has had an important impact on the group is the fact that it became recognized as a sort of quasi-independent administrative feature with our own budget and…a lot more administrative stuff is stocked, so a lot more of our group meeting time goes to discussing these things and we put in a remarkably small amount of time…we are becoming less effective as an educational change agent.

4.3.2.2 Changes in communication ypes

The types of communication used by the participants were consistent across the sessions. The largest number of utterances involved clarification (2005 of 4106). These were statements used by participants to elaborate or explain an idea that had already been initiated. There were also a consistently high number of questions asking for an explanation (573 of 4106). During sessions when there were no outside presenters (this excludes Sessions Three and Four) there were between 8 and 20 utterances per session when a participant introduced a new topic that was coded as initiation statements. The other two types of communication frequently used by the participants were modifying statements (when the speaker revised an idea) and acceptance statements (when the speaker accepted an idea presented by another). The other types of communication occurred at varying rates throughout the sessions. While there were 85 out of the total 4106 utterances that were coded as “rejection of an idea,” there were no utterances coded as “asking for rejection.” This is consistent with the stated norms and values of the group, which are addressed in Chapter Five.

In closing, Chapter Four provided descriptive information about the participants of the community of practice. In summary, over one-half of the participants were tenure-ineligible faculty members, there were slightly more males than females (8 compared to 5), and there were five participants who had ten years of experience, four with 11 to 29 years of experience, and four who had more than thirty years of experience. Chapter Four also provided descriptions of the topics of communication that occurred during each session. While the utterances related to teaching were consistently high (at least 30%),

the number of utterances related to Teaching-as-Research were low during the early sessions, increased during Sessions Four through Seven, and decreased for the remaining sessions. The Administrative utterances were low until Session Eight, when they accounted for one-fourth of the total utterances for the session and remained high for Sessions Nine through Twelve.

Chapter Five addresses the three original research questions and discusses the major findings of the study. It also includes working propositions that were formulated based on the results of the analysis.

Chapter 5

The community of practice as a whole

In this chapter I address the research questions, summarize the major findings and formulate working propositions. A proposition or hypothesis suggests how concepts may be related to each other; it communicates their potential relationship based on empirical data derived from exploratory or case study research (Eisenhardt, 1989; Strauss & Corbin, 1990). I analyzed relationships between the individual characteristics of the participants, communication patterns in the community of practice, relative power of participants, and individual and collective sensemaking. I also explored whether there were any relationships between relative power, individual and collective sensemaking, and changes in professional identity.

5.1 Question 1

The first research question asked how the individual characteristics of participants in the community of practice, including rank, gender, ethnicity, experience, and their professional identities, affected communication within the community of practice.

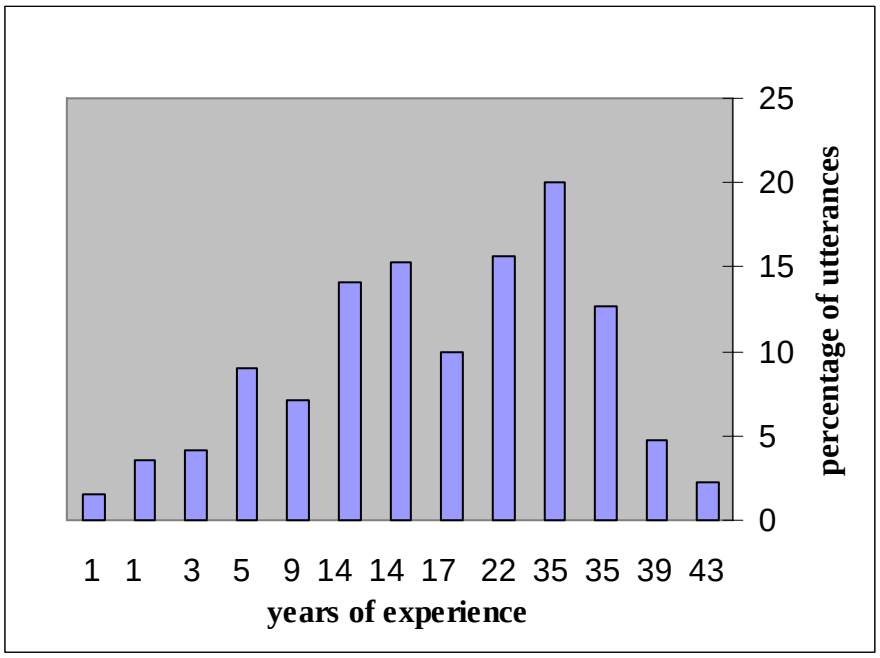
5.1.1 Individual characteristics and overall frequency of communication

I analyzed the communication of the members of the community of practice in terms of overall frequency, relative frequency of topic, and relative frequency of type. *Experience* is the only individual characteristic that appeared to influence the frequency of individual participation within the community of practice. Those participants who were in mid career (14 – 22 years of teaching experience) were the most vocal in the group. Those participants who had nine or less years or more than 35 years of teaching experience (except for one), made fewer utterances than those with 14 – 22 years of experience. As illustrated in

Figure 5-1, the utterance rates per individual approximate a bell-shaped curve. (An utterance is described by Hirokawa [1980] as "the continuous flow of verbal communication by a group member to the point at which s/he terminates verbal output or is interrupted by another participant [p. 314].") The exception was one individual who had 35 years of experience and also had one of the highest percentages of utterances in the group. This individual was a full professor. The talkativeness of this individual indicates that the characteristic of academic rank may be confounded with experience. Participants who had less than 10 years of experience were all tenure-ineligible instructors, and those with more than 22 years of experience were all full professors or emeritus faculty members. However, those in the mid-range, 14 – 22 years of experience, included both tenure ineligible and full professors. It is difficult to tease out the relative influence of career age, and rank in this case because of the small number of participants in this study. This leads to two propositions that may be tested with future studies about

interactions within other communities of practice. Proposition 1: *Instructors who are in the midst of their careers will participate more actively in an educational community of practice than individuals who are at the beginning or near the end of their careers.* Proposition 2: *Instructors who are at the highest academic rank will participate more actively in an educational community of practice than individuals who are emeritus faculty members or tenure-ineligible faculty members.*

Figure 5-1: Individual's percentage of total utterances by years of experience



There were no apparent patterns of relative frequency of participation associated with gender. I expected that the female members of the group would be less verbal, because there were fewer females in the community of practice and they were all tenure-

ineligible instructors. Prior research (Hibbard & Buhrmester, 1998; Reevy &Maslach, 2001) indicated that women's participation would be affected by gender role socialization; that is women would tend to speak less often. However, as indicated in Table 5-1, the number of utterances for males and females in the community of practice ranged from minimal (1.5% for Kim and 2.3% for Fred) to at least 15% of the total group utterances for the groups they attended (15.3% for Shelley and 20% for Justin). Ethnicity was not a factor since all of the participants were Caucasian.

5.1.2 Individual characteristics and relative frequency of topic of communication

There was no apparent pattern associating the participants' professional identities with topic of communication. Individuals who identified themselves primarily as teachers had just as many (or few) utterances regarding teaching as those who identified themselves primarily as integrated professionals or researchers. For example, Donna identified herself primarily as a teacher and contributed 2.2% of the total utterances about teaching in the sessions she attended. Fred, who identified himself as an integrated professional, contributed 1.5% of the total utterances regarding teaching during the sessions that he attended. Another example is Scott, who identified himself as a researcher, but contributed 10.3% of the total utterances about teaching, and only 5.3% of the total utterances about research. Thus, I found no discernable pattern of association between the ways participants identified themselves as professionals and their relative share of utterances about any communication topic. In addition to on-task topics of communication, there was no apparent pattern between individual characteristics and off-

task communication. Those individuals with high percentages of off-task utterances were full professors or emeritus as well as tenure ineligible faculty members, male and female, and identified themselves as primarily either integrated professionals or as teachers.

Table 5-1*: Individual Participants and Percentage of Utterances by Topic*

Name	Communication Topics							Total number of group sessions attended	Total utterance % for group sessions attended*
	Teach	Research	TAR	Procedural	Logistics	Admin	Off-task		
Justin	20.2	26.7	22.0	25.8	22.2	17.4	20.8	12	20.0
Keith	12.0	11.1	7.7	26.8	21.2	21.3	18.1	12	15.6
Shelley	16.1	9.1	6.6	10.8	17.3	18.2	14.7	10	15.3
Kathy	14.1	23.5	13.2	7.4	8.2	16.1	13.8	10	14.1
Jack	12.2	3.6	2.6	6.5	5.6	18.2	12.9	8	12.7
Scott	10.3	5.3	0.4	13.9	24.4	10.2	9.0	10	9.9
Janice	9.9	15.8	14.6	1.3	2.8	5.8	5.7	7	9.0
Eric	9.9	20.0	5.8	80.0	0.0	3.6	3.6	10	7.1
Ben	6.0	5.3	6.1	4.7	1.7	1.4	4.8	8	4.7
Donna	2.2	0.0	28.1	5.2	2.6	1.6	3.1	11	4.1
Michael	2.7	0.0	0.0	1.0	16.1	6.8	5.1	6	3.5
Fred	1.5	0.0	0.0	1.2	3.2	2.9	6.1	7	2.3
Kim	0.8	0.0	0.0	5.0	0.0	2.2	0.8	7	1.5

* Utterance % is participant's total number of topic utterances divided by the total topic utterances for the sessions attended by the participant.

5.1.3 Individual characteristics and relative frequency of type of communication

I analyzed all of the utterances by types of communication to determine if there were any possible associations with the individual characteristics of the participants. Out of the seventeen different types of communication that I identified and coded for, I found relationships with at least one individual characteristic and seven types of communication utterances. In the sections that follow, I describe them based on the communication type.

5.1.3.1 Initiation statements

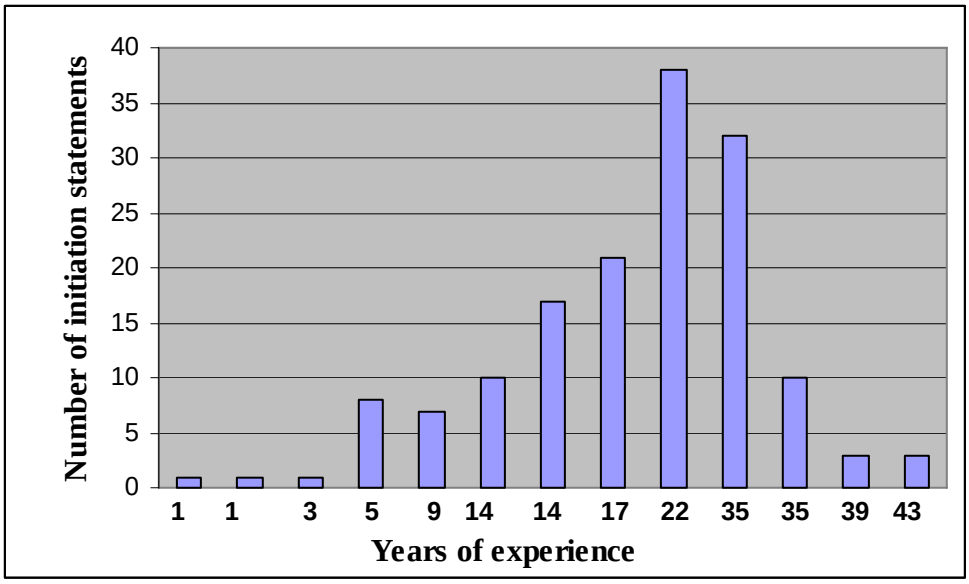
An initiation statement occurred each time a new topic was first mentioned by a participant. The relationship between initiation utterances and experience is similar to that between frequency of utterances and experience. The members of the community of practice who were in mid-career initiated more new conversations in the group than those who were in their early or late career. There was also a relationship between gender and the number of initiation utterances. Males initiated more new conversations than females. On average, the males had 9 initiation utterances while the female participants averaged 7 initiation utterances. The individual characteristic of professional identity of the participants did not seem to be related to the relative percent of initiation utterances within the community of practice. Six individuals had at least 10 initiation utterances (see Table 5-2**)**.

Table 5-2*: Number of Initiation Utterances*

Name	Teaching	Research	TAR	Procedure	Logistics	Admin	Total for all Sessions
Keith	16		5	7		10	38
Justin	11	2	3	7	4	5	32
Scott	9	1		6	1	4	21
Shelley	11			1		5	17
Kathy	7		1		1	1	10
Jack	5			1		4	10
Janice	5	3	2				8
Eric	4		3				7
Fred	2				1		3
Ben			1	1		1	3
Michael	1						1
Donna			1				1
Kim						1	1

Within this community of practice, frequency of initiation utterances was related to gender and experience during the observation period. Figure 5-2 illustrates the number of initiation statements by years of teaching experience.

Figure 5-*2: Number of initiation statements based on years of experience*



5.1.3.2 Clarification statements

Clarification statements occurred when a member of the community of practice developed an idea or concept by providing some elaboration, more information, or an example. *Experience* is the only individual characteristic that appeared to influence the relative frequency of clarification statements made by participants in the community of practice. Those participants who had between 14 and 35 years of experience (in the midst of their careers) made an average of 241 clarifying statements compared to those with less experience (less than 14 years) who averaged five clarification utterances or those who had more experience (over 35 years) who averaged 47 clarification statements. It did

not appear that gender, rank, or professional identity was associated with the relative amount of clarification statements during the semester.

5.1.3.3 Substantiation statements

A statement of substantiation occurred when a member of the community of practice would offer evidence to support her or another member's previous statement. As with statements of clarification, the individual characteristic of *experience* appeared to be associated with the relative number of substantiation utterances during the semester. The members of the community of practice who had between 14 and 35 years of experience averaged 22 statements of substantiations compared to those with less than 14 years of experience who averaged five utterances, and those with more than 35 years of experience (who averaged only three substantiation utterances.) The relative number of substantiation statements did not appear to be associated with the individual characteristics of rank, gender, or professional identity.

5.1.3.4 Statements asking for substantiation

Statements asking for substantiation occurred when a member of the community of practice asked another member for proof or evidence regarding a previous statement. *Gender* was the only individual characteristic that was associated with the relative frequency of statements asking for substantiation. Male members of the community of

practice averaged twice as many utterances asking for substantiation than the female members.

5.1.3.5 Modification statements

A statement of modification occurred when an original idea was revised by a participant. The individual characteristic of *gender* was associated with the number of modification statements. Males within the community of practice averaged 20 utterances while females averaged 17 modification utterances. The individual characteristics of rank, experience, and professional identity did not appear to be associated with the number of modification statements.

5.1.3.6 Statements of rejection

Statements of rejection occurred when one individual did not agree with another member's clarification. Both the characteristics of *gender* and *rank* were associated with the number of rejection statements in this community of practice. Male participants averaged seven statements of rejection compared to female participants who averaged five statements of rejection for the twelve sessions. The members of the community of practice who were full professors averaged at least three times more rejection utterances than did those members who were tenure-ineligible or of emeritus status. The full professors averaged 17 statements; the tenure-ineligible averaged five, and the emeritus averaged only three rejection utterances. It did not appear that there was any association

between experience and professional identity in regards to statements of rejection. The frequency of rejection statements was not related to the individual characteristics of experience of professional identity.

5.1.3.7 Summary statements

Summary statements were made when a member of the community of practice paraphrased a thought or set of thoughts that had been discussed within the group. As with statements of rejection, frequency of summary statements was related to both *gender* and *rank*. Male participants averaged at least three summary statements compared to the female participants who averaged only one. The full professors averaged nine summary statements while the tenure-ineligible faculty members averaged only two, and the emeritus faculty offered no summary statements.

5.1.4 Summary of associations between individual characteristics and communication

Overall, while experience, gender, and rank appeared to play a part in the frequency of participation regarding specific topics and types of communication, professional identity was not associated with the topics and types of communication that occurred, for this study. In summary, *experience* was related to the frequency of initiation statements, clarification statements, and statements of substantiation. *Gender* was related to the frequency of initiation statements, asking for substantiation, modification

statements, rejection statements, and summary statements. The frequency of rejection statements and summary statements was also related to the *rank* of the participants.

The associations found were for the particular community of practice during a specific time period. Table 5-3 summarizes the associations found. All associations found could be investigated with other community of practices.

Table 5-3*: Associations between overall communication frequency and individual characteristics*

Individual Characteristics	Rank	Gender	Experience
Communication			
Overall frequency	X		X
Topic			
Type			
1. initiation		X	X
2. clarification			X
3. substantiation			X
4. asking for substantiation		X	
5. modification		X	
6. rejection	X	X	
7. summary	X	X	

5.2 Question Two

The second research question examined how characteristics of the community of practice, including norms, values, relative power of members, and the topics and types of communication, influenced individual and collective sensemaking. The norms and values expressed by the members of the community of practice influenced the collective sensemaking that occurred within this community of practice. The majority of the

members of the community of practice expressed norms and values related to respect which may have influenced the participants to stay focused on a few issues related to teaching and administration rather than risk potential conflict by discussing new topics. In addition, the results indicate that the relative power of group members may have influenced the frequency of focus on particular topics of communication during the twelve group sessions. The participant who initiated the most conversations during the semester of observations was also one of two individuals identified by the members of the community of practice as being especially influential.

5.2.1 Norms

Norms are informal or unspoken rules that govern members' behaviors, including who speaks first in the group, who provides the agenda for a meeting, and whether interruptions are tolerated (Scott, 1998). The group norms that participants identified during their initial interviews focused on respect and collegiality. The communication observed in the community of practice during the semester reflected these norms as it was collegial and affirming. While group members did interrupt each other throughout the twelve sessions, most interruptions were supportive or neutral, only 12% were intrusive. In addition, the members who interrupted the most were not identified as influential group members.

When elaborating about his response one of the participants went so far as to describe the group as "Camelot". He explained this comparison by stating that members interacted without "in-fighting," that "there is peace and tranquility… the members are

sensitive to the feelings of others and decisions are made by the group." Similarly, other participants said that "we respect each other," and "there is a professional attitude." Still others stated, "we are never insulting," "we have a congenial environment," and "it is a collegial environment." Therefore, I analyzed whether the norms they identified were evident in the types of communication participants used during all observed sessions. Table 5-4 summarizes the types and topics of communication used in all twelve sessions (see Appendix F for tables for each of the 12 sessions).

Table 5-4*: Total Frequency of Utterances by Type and Topic for all Twelve Sessions*

Grand Total	Off-task	Initiation	Restate	Ask for Restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Acceptance	Rejection	Ask for Rejection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		71	14	12	1050	300	114	12	138	3	206	1	53		18	1	19	11	2023
Research		4			26	9		1	1		2		2						45
TAR		16	2	2	147	51	16	3	14		22		3		2		2	6	286
Procedure		23	1		107	36	1		6		11		4				1		190
Logistics		7			57	16			5		13				1				99
Admin		31	1	1	618	161	29		80		123		23		13		9	4	1093
Off-task	370																		
Total	370	151	18	15	2005	573	160	16	244	3	377	1	85	0	34	1	31	21	4106

As illustrated in Table 5-4 most of the communication within the community of practice was collegial and respectful. There were far fewer negative statements than affirming utterances. Only 85 out of the total 4106 utterances involved rejection of another's idea. An example of a statement coded as rejection is "that's not necessarily true," or "don't belittle his effort" (in regards to a participant buying flowers for a staff member who was ill). During Session Nine, when the communication focused on the teaching issues about students' needs, and the administrative issue of presenting a plan for requested building space to the administrators, there were no utterances that involved the rejection of another's idea. In contrast, there were 22 utterances of rejection (out of a total of 640) during Session Eleven when the group was talking about an online course management system and how to use the building space the group members had requested. For the rest of the sessions, the number of utterances rejecting another's idea ranged from three to 12.

In contrast, 377 out of the 4106 utterances involved acceptance of others' statements. Statements of acceptance included "this is really better," and "I think Scott is right" (when discussing grade issues). During Session Four (when the concept of Teaching-as-Research was presented), there were only two utterances accepting another's idea. However, during Session Twelve when the group was deciding how to spend monies and which presenters to invite to speak to the group, there were 88 utterances of acceptance. The number of utterances of accepting another's idea ranged from nine to 55 for the other sessions.

When discussing norms during their interviews, individual members of this community of practice talked about mutual respect and how members were sensitive to

the feelings of others. To determine if their actual interactions substantiated what they had told me, I analyzed the number of times participants interrupted one another. Interruptions accounted for 7% (285 of 4106) of the total utterances in the group. I defined interruptions as occurring when someone broke into the flow of another's conversation. Interruptions can be classified as one of three different types: supportive, neutral, or intrusive (Karakowsky, McBey, & Miller, 2004). Supportive interruptions are those when an individual agrees with a statement made by another, or perhaps asks, in a positive way, for more information (Karakowsky, et al.). A neutral interruption occurs when an individual asks for clarification or elaboration with no evaluation of the content of the former speaker's statement (Karakowsky, et al.). When an individual changes the topic or makes objections to another's statement, this involves an intrusive interruption (Karakowsky, et al.). Table 5-5 shows the frequency of each type of interruption made during the interactions among this community of practice for each session.

Neutral interruptions occurred most often (45% of total interruptions). In a conversation during Session One for example, some of the participants in the community of practice discussed the difficulty grading a certain student.

> Justin: This person had every opportunity in the world (rejection)
>
> Shelley: That's what I mean; I wouldn't feel bad about giving that person a D. (acceptance)
>
> Kathy: (interrupts) She has poor judgment, she tried and tried (acceptance)

There was also a high percent of supportive interruptions (43%) in this community of practice. An example occurred during Session Eight during a conversation involving decisions about laboratory space.

> Kathy: There might be times when there is no lab meeting, and then we could have open instrument room hours for students to work on projects (clarification)
>
> Keith: (interrupts) I think that is exactly the kind of thing I am imagining (acceptance)

A small proportion (12%) of total interruptions was intrusive. One example occurred in Session Five during a discussion about curricular drift and an instructor's course changes.

> Michael: he was great with the kids; you could see that he really enjoyed the experience(substantiation)
>
> Shelley: yes, I think collecting some of the (acceptance)
>
> Justin: (interrupting) but we cannot tailor a program based on a few anecdotal stories (rejection)

Table 5-5: Types of interruptions per group

Session #	Types of interruptions		
	Supportive	Neutral	Intrusive
1	19	10	6
2	5	4	4
3	8	8	1
4	3	3	1
5	3	6	2
6	0	1	2
7	3	9	2
8	24	25	0
9	14	13	4
10	9	12	1
11	25	28	9
12	20	18	4
Total	122	127	36

Two individuals who were among the most vocal in the group were also the most frequent interrupters of conversation. Neither was identified as being influential by more than two other group members. These findings are consistent with the results of a study by Karakowsky and others (2004) that examined influences of power and verbal interruptions in groups. They found that group members who interrupt are less likely to be viewed by other members as leaders in the group. The findings from Karakowsky and his colleagues (2004) along with the results of my analysis (that the two most frequent interrupters were not seen as influential by other group members) lead to the empirically grounded Proposition 3: *Individuals who frequently interrupt others are less likely to be viewed by other members of a community of practice as having power or influencing others.*

I also analyzed initiation, and as illustrated in Table 5-4, there were a low number of initiation statements (151 out of the total 4106 utterances). Considering this amount of initiating statements, the community of practice spent a great deal of time discussing the same topics rather than embarking on new issues.

I also found that there were a low number of intrusive interruptions (36 of 4106 utterances) and minimal rejection statements (85 of the 4106 utterances). The two topics that the group spent a great deal of time discussing were teaching (2023 of the total 4106 utterances) and administrative issues (1093 of 4106). These two topics also had the highest number of initiation statements (71 initiating new conversations about teaching and 31 initiating new conversations about administrative issues). Conversely, the group did not spend a lot of time discussing new topics, such as Teaching-as-Research. Overall, only 286 of the total 4106 utterances addressed Teaching-as-Research. Only 16 of the

total 151 initiating statements were about Teaching-as-Research, which means the group did not spend a lot of time involved in discussion about this new concept. The four individuals who had the highest number of initiating statements and the highest number of total utterances initiated conversations within the community of practice regarding teaching and administration and maintained these conversations (see Tables 5-3, and Figures 5-1 and 5-2.) These same participants did not, however, contribute a great deal to the conversations about Teaching-as-Research. In fact, it was the topic of communication to which they contributed the least.

Considering that the participants who initiated and maintained the most conversations talked about teaching and administrative issues rather than Teaching-as-Research, the norms appeared to minimize collective communication about Teaching-as-Research within the community of practice. Because of the norm for polite and respectful communication within the community, participants may have continued to address the same issues rather than risk possible conflict by proposing many new topics. The four participants who initiated the most conversations and contributed the most to the overall interactions kept the topics of communication focused on teaching or administration with the support of the group norms. This reduced opportunities for collective sensemaking about Teaching-as-Research.

5.2.2 Values

When I asked participants what values were most important to the group they responded in one of two ways. Five participants in the community of practice focused on

the *process* of the group communication, such as demonstrating mutual respect, never demeaning one another, and being honest. The values expressed by these participants were quite similar to the norms expressed and described in the previous section. One participant even said the group value is like the musketeers. He elaborated by saying, "We are all in this together. You should think about how your actions affect the whole." This subgroup was comprised of one emeritus and four tenure ineligible faculty members, two of who were male and three female.

The other eight participants discussed the *content* of communication, stating that the group valued undergraduate education. Of these individuals, two were emeritus, two were full professors, and four were tenure ineligible. There were six males and two females in this category. For example, one male participant said, "the group exists for the improvement and enhancement of undergraduate education." A female participant stated that the key value in the group was "the well-being of the undergraduate students, and providing the best possible training for them and their futures."

Members of the community of practice who discussed the value of undergraduate education had an average of 167 utterances regarding teaching compared to those who valued mutual respect, who had an average of 138 teaching utterances. Those who stated that mutual respect was a group value had more procedural utterances (an average of 18) compared to those who discussed undergraduate education as a value (an average of 13 utterances.)

The amount of time spent discussing the topic of teaching reinforced that the community of practice valued undergraduate education and teaching. The participants spent most of their time discussing teaching issues but little time on the new concept of

Teaching-as-Research. While Teaching-as-Research is related to teaching, it involves evaluation and change in teaching strategies to improve student learning. The teaching issues discussed by the members of the community of practice involved placement testing for students, the scheduling of courses, the mentoring program for undergraduates, and curricular issues related to the freshman seminar. While these issues also relate to student learning, they do not involve making changes to teaching strategies. The value of mutual respect, which addresses the process of the group, is a restatement of the norms discussed by group members (collegiality, respect, and professionalism.) This leads me to believe that, like the group norms, the values of this community of practice may have reduced chances for collective sensemaking regarding Teaching-as-Research.

5.2.3 Relative power

During the first interview, two individuals were identified by a majority of participants as especially influential either within the community as a whole or to each individual respondent (see Appendix B for the initial interview questions). The Sage and the Organizer[7] were identified as most influential by 11 of 12 and six of 12 participants respectively. In contrast, the most any other participant was identified as influential was by three of 12 participants (One of the 13 did not respond to this question because she was a member of another department). The Sage and the Organizer identified each other

[7] To ensure the confidentiality of the participants in this study, their pseudonyms are not used in this discussion.

as influential. I observed that these two influential participants had differing effects on the topics of communication over the course of the semester.

The Sage was one of the more senior members of the group. He was identified by the others as “having values and ethics beyond approach,” “one of those people who does think of the greater good,” and is “the kind of teacher I aspire to be.” As an outside observer, I was aware of his presence even when he did not speak. I observed that individual members would look at him more often than at other participants when talking. Reasons participants gave for why the Sage was influential to the group included “he is the foundation,” and “he developed a consensus and talked through things.” Participants explained that the Sage was personally influential with statements such as “he was my mentor,” and “he taught me to think better.” The Sage stated that he used to have much influence on the group, but now he believed the Organizer had more influence.

The Organizer had also been a member of the group since its inception, and was in the prime of his career. The Organizer was described as one who “thinks about things deeply,” and “thinks things through, and very open to others.” I observed that the Organizer appeared to manage the group. Other members asked him about agenda items, and he proposed the issues that should be addressed during the sessions. He also attended every session. Participants said the Organizer influenced the group because “he is thorough and detailed,” and “he organizes and keeps track of things.” Participants felt the Organizer was influential to them personally because: “he is very patient,” and “he really has the overall picture.”

The Organizer was one of two members of the group who had the highest percentage of utterances during all the sessions: 15.6% of the total utterances. In contrast,

the Sage's utterances comprised only 4.7% of the group's total. While there were differences in their frequency, topics, and types of communication, (see Table 5-6), the Sage was identified as an icon of what the group hoped to represent ("his values and personal ethics are beyond reproach and everyone honors him for that") and Organizer was perceived as the person in charge ("he has been the key person in the group for about the last four or five years"). The communication styles and interests of the Sage and the Organizer influenced the group's topic of interaction at two key points during the semester.

Table 5-6*: Frequency of Topics and Types of Communication for the Sage and Organizer*

Sage	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for clarify	Substantiate	Ask for substantiate	Modify	Ask for modify	Acceptance	Ask for acceptance	Rejection	Ask for rejection	Synthesis	Ask for synthesis	Summary	Support	**Total**
Teach					53	25	5		7	1	7		2		1				**101**
Research						2													**2**
TAR		1			4	10													**15**
Procedure		1			2	1			1										**5**
Logistics						1													**1**
Admin		1			8	1													**10**
Off-task	12																		**12**
Total	**12**	**3**	**0**	**0**	**67**	**40**	**5**	**0**	**8**	**1**	**7**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**146**
Organizer																			
Teach		16	1	2	102	39	15	2	2		30		8		2		2	3	**243**
Research					1	2	1				1								**5**
TAR		5			12	2	1				2								**22**
Procedure		7			26	12			3		3								**51**
Logistics					8	7			2		4								**21**
Admin		10			123	30	8		22		28		3		4		4	1	**233**
Off-task	67																		**67**
Total	**67**	**38**	**1**	**2**	**272**	**92**	**25**	**2**	**48**	**0**	**48**	**0**	**11**	**0**	**6**	**0**	**6**	**4**	**642**

The Sage and the Organizer influenced the topic for discussion in the community of practice in different ways. During Session Five, after the group had learned about Teaching-as-Research, the Organizer said that presentation made him think about how much the group had moved away from discussions of teaching and that there should be a conscious effort to return to those conversations whenever possible. Apparently outside the group sessions (see section 4.2.5), the Sage suggested that Donna present her reflective efforts at curricular or teaching improvement. During Session Seven, one member of the group stated,

> We thought that it would be fun to offer the opportunity to whoever wanted to take the podium for a while periodically and say something about an advancement in a class or something that's going on in a specific class or lab situation rather than doing just always tons of miscellaneous items like we usually do. Donna has been waiting patiently for a few weeks to talk about the subject of (class name).

Donna began her presentation by stating, "well, this is actually [the Sage's] idea to talk about it…" Donna spent most of Session Seven discussing changes she had made to one of her classes based on student feedback. Group members asked questions, and made suggestions for further refinement of the course. [So both the Organizer and the Sage played a role in one continuation of conversation about Teaching-as-Research.] In later sessions, however, there were few discussions about Teaching-as-Research.

The Organizer's frequent communications about administration of the curriculum and procedures of the group appeared to exert a stronger influence on topics discussed in the community of practice than comments by the Sage. Early in Session Eight, for example, the Organizer initiated conversation about administrative issues. He provided the group with an update on some improvements made in the stock rooms and then

continued to lead the discussion regarding College space the community of practice was interested in renovating for undergraduates. The number of administrative utterances increased beginning with Session Eight, and remained substantial for the remaining sessions as the Organizer initiated similar conversations about administrative issues. The Organizer had the highest percentage of utterances regarding administration (21.3%) while the Sage had the lowest (1.4%) for the groups they attended.

The informal influences of the Sage and the Organizer were consistent with Huzzard's (2004) theorizing about power in communities of practice. Although there may be no formal power structure within a community of practice, there is likely to be an informal sense of relative influence among members of the group (Huzzard, 2004). Power need not involve conflict, but may be manifest as individuals manipulate agendas or engage in subtle avoidance of decision-making (Bacharach & Baratz, 1962). For example, in Session Five the Organizer suggested having future discussions of teaching-as-research and this idea was reinforced by another vocal participant. This exchange comprised only ten utterances, however, then the topic quickly changed when a different participant asked the Organizer about course descriptions. While the Organizer said teaching and issues related to Teaching-as-Research were important, other topics of communication took precedence for him. (In fact, the Organizer had 22 of the group's total 286 utterances about Teaching-as-Research).

The Organizer initiated more topics of conversation during the twelve sessions than any other participant. The Organizer spoke 38 of the 151 initiation utterances. As shown in Table 5-2, only two other participants initiated a large number of topics for discussion (32 and 21). The Organizer's initiating statements were mostly about teaching,

procedural, and administrative issues. In particular, the Organizer initiated an average of 38% of the conversations regarding administration issues in Sessions Eight through Twelve.

French and Raven (1959) state that there are several types of power that a group member may have based on individual characteristics. An individual may attribute power to another based on his or her own desire to emulate the other (referent power) or the other's ability to give rewards, legitimate rights, or expertise, or the ability to give or threaten punishments coercively (French & Raven, 1959). Based on the categories of power defined by French and Raven (1959), the Sage had both referent and expert power and the Organizer had expert power. Statements made by participants in the community of practice reflect the expert power of the Sage, "he was the kind of teacher I would aspire to be," and his referent power, "he was the foundation of the group" and "he is well respected and extremely professional." The Organizer was identified as "the key person in the group for about the last four or five years." Group members' comments reflected his expert power through statements such as "he has a great deal of teaching experience and has influenced my teaching." He had demonstrated the ability to initiate topics of conversation within the group and had over 20 years of experience of teaching.

One of the characteristics of a good leader is the ability to communicate (Hollander, 1964; Meindl, 1993; Underwood, 2004). In addition to verbal effectiveness, Hollander (1964) also stresses that a good leader be able to motivate a group, know what is expected (group goals) and what he can do to initiate change. Underwood (2004) (based on his interview with Jerry Porras) stressed how leaders want their group (or company) to live their values, know their purpose, and help the group or organization

pursue its purpose. Leadership emerges as a result of how group members think about their goals and their relationships to each other (Meindl, 1993).

According to Huzzard (2004), power in a community of practice "finds its expression in the discourse through which parties to a relationship interact (p.355)." Communication, therefore, is a necessary part of group work so that each understands what others are thinking. It also becomes a way by which dominant participants may take a more active role than others in constructing the group's learning (Huzzard, 2004). In a study of decision-making groups, (Hirokawa & Pace, 1983) found that each group in their sample contained at least one member who was able to influence the thinking and discussion that occurred in the group, which in turn influenced the quality of the decisions made by the group.

In this community of practice, the Organizer contributed more than others (see Table 5-1) to the conversations regarding administration (21.3 % of the total utterances), and this was one of the two topics most discussed (there were 2023 utterances of teaching, and 1093 utterances of administration of the total 4106 total utterances) during the semester this community of practice was observed. In contrast, the Sage made only three of the 151 initiating statements during the twelve observed sessions of the community of practice. He had a total of 146 out of the total 4106 utterances for the group and contributed minimally to the conversations regarding administration (1.4% of the total utterances). While many of the participants in this community of practice identified the Sage as being personally influential to them, it appears that this influence did not continue within the community of practice. This is consistent with a statement he

made during his initial interview, “I may have been influential before; but now it is (the Organizer).”

The Organizer contributed a great amount to the conversations of teaching and administration. He was identified by the group as being someone who was influential, had the highest number of initiation utterances and so was informally setting the agenda. These findings lead to Proposition 4: *An individual in a community of practice, who initiates and contributes new conversations more than other members, will informally set the agenda by influencing which topics are discussed within the group.*

5.3 Question Three

The third research question examined how, if at all, the professional identities of individual members were modified by individual and collective sensemaking about Teaching-as Research, a concept that was new – at least by name -- to the community of practice. I approached this question in three phases. First, I analyzed individuals’ sensemaking about the concept of Teaching-as-Research. Second I analyzed whether collective sensemaking about Teaching-as-Research occurred in the community of practice. To do so, I contrasted discussions of Teaching-as-Research with four other discussions held by members of the community of practice and compared aspects of all five discussions with Weick’s (1993) description of collective sensemaking. Third, I analyzed whether individual or collective sensemaking in the group regarding Teaching-as-Research had affected the participants’ professional identities.

5.3.1 Individual Sensemaking about Teaching-as-Research

Initially, I planned to ask each individual to explain the concept of Teaching-as-Research at the beginning of the semester, and again during their final interviews. However, when I attempted to ask the participants for a definition of Teaching-as-Research at the beginning of the semester (after the initial interview) I was able to obtain a response from 9 of the 13 participants prior to the discussion of Teaching-as-Research in Session Four. Four participants were not available to answer the question regarding a definition of Teaching-as-Research. When I asked them to define Teaching-as-Research at the end of the semester, these four participants defined the term similarly to the definition provided during the presentation: Teaching-as-Research involves the deliberate, systematic, and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and outcomes of students and teachers (CIRTL, 2003).

Three of the nine individuals who responded to the initial question reported they did not understand the concept or did not have an interest in it. Two of these individuals maintained that opinion at the end of the semester, and the third identified Teaching-as-Research as defining his current instructional program. The six remaining individuals defined Teaching-as-Research in a similar manner both times they were asked but with more elaboration the second time. Their definitions were similar to those given during the CIRTL presentation. Table 5-7 summarizes the remarks of the participants during the initial and final interviews.

Table 5-*7: Teaching-as-Research defined*

Name	Initial definition	Final definition
Ben	Not available	Teaching-as-Research suggests that in the process of teaching, you are doing research. Teaching as learning works for me
Jack	Not available	You come up with an idea, you do a careful assessment, and you get a positive response. I think it is hard to make a worthwhile assessment
Janice	Not available	Teaching inquiry
Michael	Not available	Backroom research; make changes, implement different ways of teaching by assessing
Eric	Not sure what that means	My teaching and research are intimately integrated (my instructional development program)
Fred	I don't even understand that	I didn't follow the presentation very well
Scott	Nothing, my research has little to do with teaching	to say "teaching as research" doesn't fit the way I think about things very well
Kathy	Look at research, how do students learn and what is the most effective way to teach them?	Look at how students learn, and are they achieving the outcomes you set?
Keith	Take a hard look at what we did last year, and how we can improve on that.	Learn new ways to manipulate; I am training in my field, not as a professional educator
Kim	Make learning fun; search for ways to teach better; adapt the current curriculum	There are different ways of teaching and you have to find the good ways to teach in the best possible way
Justin	Bring research into the classroom; a process, do and see if it works	The integration of a research mentality into the classroom
Donna	As with research, teaching is constant development	Teaching itself is research, you experiment and then try different things
Shelley	How to contextualize what I know and teach it; in order to understand a concept I have to try it myself	Teaching is research to me. How can we convey the information that we need to convey? It's all those things you need to do to solve a problem.

Twelve of the thirteen participants understood the concept of Teaching-as-Research. The final definitions given by these participants focused on how the concept specifically related to them and their work. Eric, for example, stated that his teaching and research were intimately integrated. Shelley demonstrated a more general understanding of the concept, when she stated that teaching is research to her.

In order to understand individual sensemaking about Teaching-as-Research, I analyzed the individual reflections participants made about this concept during their final interviews. Weick (1993) stated that sensemaking is retrospective and ongoing; and that individuals repeatedly rationalize what they have done and decisions they have made in order to understand them (Weick, 1993). Sensemaking involves acting and then trying to understand one's own action (Weick, 1993). While some of the participants stated during their final interview that they were not interested in the idea of Teaching-as-Research, they still engaged in individual sensemaking about the concept. For example, Scott, who stated that the concept of Teaching-as-Research did not fit with how he thinks about his work, developed an understanding of the concept and *justified* his disinterest (action) when responding to the interview questions. Similarly, when others in the group defined Teaching-as-Research during their final interview, they talked in terms of their own teaching, using their teaching methods and beliefs to *assign meaning* or define the term Teaching-as-Research.

Perhaps they were defining Teaching-as-Research in terms of their teaching and using personal teaching examples to refine their definitions because they were talking to me (the person responsible for bringing persons to talk about Teaching-as-Research to the group) and they felt it was important to do so. Individuals typically explain their actions

in terms of the values and norms of the social groups they view as being important. For example, Eric defined Teaching-as-Research as "What I have been doing in terms of my instructional developmental program development as research." When Donna defined Teaching-as-Research, she stated, "Teaching itself is research; trying different methods, trying new things, or changing curriculum a little bit. When I think of teaching as research, it is changing the way I present things." Kathy also discussed Teaching-as-Research in regards to her teaching,

> Whenever you deal with a course, there are going to be problems. What is my goal and are they (the students) getting it? Looking at how students learn, are they achieving the outcomes that you hope they are going to achieve.

Regardless of whether or not the participants bought into Teaching-as-Research, based on their *interpretations,* reinforced by their *justifications* during the final interviews, they had engaged in individual sensemaking about the concept. The participants were *voluntarily* defining Teaching-as-Research based on their own experiences, being *explicit* in their definitions, and doing so *publicly*, during their interviews with me.

5.3.2 Collective Sensemaking within this Community of Practice

In a group setting, collective sensemaking occurs as group members try to understand something ambiguous together (Weick, 1995). As the members of a group try to understand, they are involved in committed interpretation; their actions are voluntary, public, and explicit (Weick, 1993). When sensemaking occurs within a group, the

members become bound to their interactions with others, and this causes the individuals to become committed because their action is public, voluntary, and irrevocable to the others in the group (Weick, 1993). Collective sensemaking is a reciprocal process where group members obtain information from each other, and give meaning to what they have learned. Collective sensemaking involves the individuals justifying actions in order to clarify an ambiguous topic to others present (Weick, 1993). Individual group members justify their actions with explanations likely to be credible to and supported by the other group members (Weick, 1993).

To analyze sensemaking about Teaching-as-Research in this community of practice, I compared members' discussions about Teaching-as-Research with their discussions about other topics. In particular, there were five topics discussed during the semester which members of the community of practice discussed at some length (see Table 5-8.) These five topics constituted over one half of the total group utterances (2658 of 4106.) One was the concept of Teaching-as-Research. They also discussed three additional issues related to the topic of teaching; a new major offered within the College, the use of online resources to help with teaching, and grading graduate students who work as TAs. A fifth issue discussed during the semester was an administrative issue, and involved the group's request to the dean to use additional space in the building. Some of these issues were introduced early in the semester and raised again at least once more (the online teaching resources issue was discussed at the beginning of the semester prior to my recorded observations); while the issue of space was first discussed during Session Eight, and then discussed again in Session Nine and Eleven. With the exception of

Teaching-as-Research, each time the issues were discussed, the group engaged in strings of at least 40 utterances.

Table 5-*8: Total Utterances for Key Discussions*

Topic	Teaching Assistants	Space	New Major	Online Teaching Resources	Teaching-as-Research
Session #					
One	74				3
Two					
Three			126		
Four					28
Five					12
Six					21
Seven					195
Eight		339			
Nine		145			27
Ten	60		40	190	
Eleven		94			
Twelve					
Total	**134**	**478**	**166**	**190**	**286**

With each of these topics, the group members engaged in conversation as they tried to understand the current situation in attempt to improve it. After conversation regarding each issue was initiated, participants' utterances included much clarification and asking for clarification. When each issue was readdressed, there were more utterances that I coded as modification, substantiation, and acceptance.

I describe each of these issues separately in the following sections and explain why collective sensemaking occurred in some discussions and not in others. When the

group discussed grading the TAs and the group request for additional space, they engaged in collective sensemaking. However, the discussions the members of the community of practice had regarding a new major in the College, the use of online resources for teaching, and Teaching-as-Research did not involve collective sensemaking.

5.3.2.1 Discussion about Grading Teaching Assistants

The first issue involved the grading of teaching assistants. During Session One, a participant raised the issue of grading for teaching assistants and asserted that the grading scale should be adjusted. Up to that point in time, no graduate student had received a grade lower than a B for serving as a TA, regardless of the student's performance. A situation occurred prior to this semester in which two of the group members gave a specific TA a B even though "her performance was abysmal and everyone said the TA should be fired." One of the group members had to explain to administration how the TA could have received B's, but yet should be fired. Previously, B's reflected average performance. However, B's did not reflect this student's ability, and so the group talked about making a decision about whether to continue with the current scale or adopt new standards. During Session Ten, Scott raised the issue again. At that time, the group decided that because their current grading system did not accurately reflect the performance of the TA being discussed, they needed to make a change. The following is an example of the discussion about grading TAs during Session Ten:

> Justin: in our current system, a B has been a very marginal grade…
>
> Scott: we need to have more realistic grades if we are really going to be using letter grades for something. Some fractions of C's or even some

> lower grades, if we have a case where the student is completely unacceptable. Otherwise, the grade is a B and a B+ and it seems as though the person is doing fine. If the person was doing badly, then what are these grades?
>
> Keith: if I had to do it over again, and I am the one who gave the B, I would have given a C because I think that would communicate an unacceptable.

These three group members tried to understand the grading process, how others would interpret the grades and the implications regarding the TAs grades for future teaching assignments. The group decided to change the grading system. This was a *voluntary* decision by the community of practice, based on their desire to grade TAs in ways that reflected the TA's actual performance. They engaged in *explicit* conversations about how a grade communicated performance to the students. Finally, members of the community of practice vocalized the need for the conversation to be *public* with the other professors who had TAs working with them and were not members of the group. Thus, they were engaged in collective sensemaking regarding the current system.

5.3.2.2 Discussion about use of space

The administrative issue of use of space provides another example of collective sensemaking. Utterances related to the topic of administration increased greatly beginning with Session Eight. At that time, the community of practice discussed the relocation of half of the department and what the College administration planned for the now vacant space. The group focused much of their conversation around their decision to obtain the space for their usage for undergraduate education and how to *justify* this issue to the administration. These utterances involved collective sensemaking because the

members of the community of practice were involved in committed interpretation; they were public, explicit, and voluntary. First, they were going *public* by presenting their decision to use the space to the administrators of their College. The decision and their plans were *explicit* and *voluntary*; there was no outside pressure for them to use the requested space. For example, in Session Nine,

> Keith: I would like to know what is being planned for the building. The only thing I know is we are asking "we want this, will you give it to us". And the dean is saying yes, no, maybe. I don't know if he would tell us if we asked him straight out, "what are your plans for the whole building?" I am really curious. Maybe we can negotiate more effectively.
>
> Eric: We don't, so we can't.
>
> Keith: he doesn't want the separate departments to know and I feel like he's afraid if we get together…

Later during the same session, the conversation returned to the space issue as Justin talked about an upcoming meeting with the dean:

> Justin: …it's easily accessible to the undergraduate students and we are planning on marching some of the undergraduate students in there to talk to the dean as well.

Both of these quotes demonstrate the *explicitness* of the plan of the community of practice. Throughout the rest of Session Nine, other participants vocalized ideas about how to present the rationale for the community of practice to have access to the space. Action was taken: the community of practice asked the administration if they could use additional building space. Then the members of the community justified their actions, and became involved in committed interpretation. The administrative utterances triggered a noticeable change in the relative proportion of focus on the topic of communication for the semester observed.

5.3.2.3 Discussion about a New Major

An issue related to teaching discussed during several sessions was planning for a new major to be offered by the College. Administrators in the College had decided to offer a new major within the next academic year. Group members discussed the College's decision to offer the new major, including what considerations were involved in the decision:

> Justin: I assume, were you on the committee that put this all together?
>
> Eric: Yes.
>
> Justin: is there a demand for (major) graduates?
>
> Eric: Yes, as far as I can tell, I think it is preparation for both graduate school and for industry. I think that if they're "A" students, they will have no problem finding a job. My only concern is that at the moment the program is a little light in (science) and I think that will probably change over time, I think if you get the degree in (major) right now and applied to grad school in (science) you probably wouldn't get accepted because I don't think they have a strong enough background in (science) today to warrant the attention of a graduate program. But we cannot solve all the problems in one semester; it is a program that will develop over time.

During that conversation, the group members tried to understand the administrators' rationale for the new major, as well as what it would mean for students. The community of practice did not need to take action because the College had already decided to take the necessary steps to offer the new major. Eric engaged in individual sensemaking as he talked about the decision with the group. He engaged in committed interpretation; he used a social environment where others understand the process to discuss the decision that was made in order to rationalize or reinforce understanding (Weick, 1993). The members of the community of practice discussed the new major and

tried to understand the details. There was no need for the group members to *justify* the new major, because they were not the ones who developed the major. Although they discussed the major during several sessions, they had no *explicit* plan to *publicly* present the major. The community of practice took no action and thus the members of the community of practice were not engaged in collective sensemaking.

5.3.2.4 Discussion of Online Teaching Resources

Another teaching concern that the community of practice discussed was online teaching resources. The instructors could use an online program to assist in communicating with students and grading students' work. This issue was discussed early in the semester and was revisited during Session Eleven. There was external influence for the members of the community of practice to use the resource.

> Kathy: I found out it can do the grade book and so I thought I could make my TAs enter their quizzes weekly and if they keep their scores in the grade book, I can access them 24/7.
>
> Keith: I don't want any more administrative work and I
>
> Kathy: no, it in theory should be less. The grades would be on there and
>
> Shelley: all you'd have to do is go look at them.

This conversation involved several of the participants. The members of the community of practice talked about what they did or did not like about the program. The College had decided that the faculty members should use the online resources. The use of online resources was not one that the group needed to *justify*; they had not made the decision, so

it was not *voluntary* and the group did not need to *publicly* present the idea to others. Thus there was no collective sensemaking that occurred.

5.3.2.5 Discussion about Teaching-as-Research

The members of the community of practice had conversations about examples of Teaching-as-Research. Some strings of conversation were short (only two utterances long during Session Nine) while others were rather extensive (39 utterances long during Session Seven). These conversations were about examples of Teaching-as-Research such as using in- class feedback with students in Session Nine and Donna's presentation in Session Seven (see section 4.2.7), but were not about the meaning of the concept itself. The other issues discussed in the group had longer strings of utterances, such as the grading of TAs (a string of 60 utterances occurred during Session Ten), discussions about the space to be acquired (94 utterances in a string during Session Eleven), or the new major (a string of 40 utterances occurred during Session Ten).

During the semester of observation, the effort to encourage the community of practice to explore Teaching-as-Research did not seem to have a lasting effect. One reason for this may be because the community of practice had no investment in discussing Teaching-as-Research; there was no external push for the group to focus on the subject of Teaching-as-Research other than the researcher had requested that they learn about this concept. This was not a *voluntary* conversation. The group learned about the concept of Teaching-as-Research but did not maintain a focused discussion on the subject.

Therefore, while the members of the community of practice talked about situations that illustrated Teaching-as-Research, they were not involved in collective sensemaking regarding Teaching-as-Research as a concept. There was no *commitment* to have further discussions of the concept of Teaching-as-Research; the group did not take any action that needed to be *explicit* or discussed *publicly*. Sensemaking is retrospective and ongoing; it involves taking an action and then trying to understand that action (Weick, 1993). This community of practice did not take any action regarding Teaching-as-Research, so there was no need to *justify* their actions.

5.3.2.6 Discussion and Collective Sensemaking

During the fall semester, the members of this community of practice discussed five topics I identified as significant. They spent a great deal of time talking about these five issues (see Table 5-8) and these topics were all discussed during more than one of the 12 sessions (with the exception of the discussion of online teaching resources which was initially discussed at the meeting prior to my recorded observations.) When they discussed two of these issues, the participants engaged in collective sensemaking. However, when they discussed the other three, they did not.

The issues of grading teaching assistants and requesting available building space involved the members of the community of practice taking *voluntary* action (changing the grading system and requesting building space) to which they were *committed*. In addition, they were also *explicit* in their plans and planned to discuss it *publicly* with outside individuals who were affected by their actions. These teaching and

administrative conversations continued during several of the sessions (the grading during Sessions One and Ten and the space issue during Sessions Eight, Nine, and Eleven) and involved collective sensemaking in the community of practice.

The discussions the members of the community of practice had regarding the new major, online resources, and Teaching-as-Research did not involve any action or decisions made by the group. There was no need for the participants to *justify* the new major or the use of online resources since they had not made the decisions to offer the programs. They also had no need to *explicitl*y plan to *publicly* present these ideas. The discussion regarding Teaching-as-Research was also not one that the participants had *voluntarily* chosen, it was introduced by an external source. None of these three ideas required *commitment* on the part of the members of the community of practice, and there was no collective sensemaking involved in their discussions of them. This analysis leads to a working proposition that may be tested in future studies regarding collective sensemaking in communities of practice. Proposition 5: *Members of a community of practice are more likely to be involved in collective sensemaking about an issue when it involves a need for them to make a decision, commitment to take voluntary action, and efforts to present their plan explicitly to an external individual or group.*

5.3.3 Professional Identity

To understand how, if at all, individual or collective sensemaking about Teaching-as-Research influenced any change in individual professional identity over the

course of the semester, I engaged in several analyses. First, I reviewed how individuals in the community of practice initially described their professional identities during their initial interview. Then I compared participants' descriptions of their identities at the beginning and end of the semester. Third, I reviewed each participant's opinion of change to their professional identity. Finally, I reviewed the individuals' opinion of how the discussions about Teaching-as-Research affected their overall professional identities.

5.3.3.1 Initial Professional Identity

As discussed in section 4.1.1, participants of this study were asked during their initial interview to identify themselves as primarily teachers, primarily researchers, or as integrated professionals (those who purposefully combine the two roles.) Six of the participants identified themselves as primarily teachers, one identified himself as primarily a researcher, and the remaining six of the thirteen participants identified themselves as both teachers and researchers. The individual characteristics of these participants are discussed in detail in section 4.1.1.

Those who identified primarily as teachers all expressed an interest in student learning, and how best to teach students. They talked about specific teaching issues that were important to them. Three of the six participants stated that it was important that students were learning and developing knowledge, two talked about how it was important to connect and learn with the students, and one stated that being a teacher is simply, "the best job in the world."

There was only one individual who identified primarily as a researcher, and he talked about his interest in continuing his own learning and research. His approach was similar to what Boyer (1990) calls the “scholarship of discovery”, pursuing knowledge for its own sake.

Finally, those six individuals who identified themselves as both teachers and researchers described the interaction between teaching and research in one of three ways. Two of the participants described the relationship in terms of applying research skills to teaching and learning, one of them talked about how her research influenced her teaching, and three older faculty members described how laboratory research and teaching are two separate activities that enhance each other.

This research was focused not only on the individual participants’ initial professional identities, but also on their final professional identities once the semester of observation was over, to determine if there were any changes, and what may have contributed to those changes. These issues are discussed in the following sections.

5.3.3.2 Changes in Identity

In order to determine whether or not individual participants experienced any changes in their professional identities I used two strategies. First, I asked identical questions in both the initial interview and the final interview and compared similarities and differences in individual’s responses. These questions included asking the participant what it meant to be a teacher, to be a researcher, and how (if at all) their roles as a teacher and as a researcher influence each other. As illustrated in Table 5-9, most of the

participants used very similar language in both interviews. Most changes noted involved elaborations of what participants had stated during the first interviews.

Answers participants gave to the questions regarding being a teacher or being a researcher were abstract in both interviews. For example, in her initial interview, Kim stated that being a teacher meant "being sure that students are learning." During her final interview, Kim specified that being a teacher meant "having students understand concepts." Another example is Scott's definition of being a researcher. During his initial interview, he stated it means, "asking questions and finding answers." In the final interview he elaborated that being a researcher means to "discover new things." When participants talked about the mutual influence between or integration of teaching and research, their answers were also consistent in both interviews. For example, in the initial interview, Donna said, "they go hand-in-hand" and in her final interview, she stated, "they are definitely related."

There were three individuals whose responses to a question of final identity reflected how they integrated teaching and research in their own careers. For example, Eric whose initial researcher answer was "being a teacher is more important" stated in his final interview that research "helps me improve my teaching." A second example is Justin. When he talked about the integration of teaching and research, he initially said "they are not really integrated." In his final interview, Justin said, "my research does not inform my teaching, but rather the other way around."

Table 5-9: Interview answers regarding professional identity

Name	Initial Teacher	Final Teacher	Initial Researcher	Final Researcher	Initial Integrated Professional	Final Integrated Professional
Ben	Doing something well	n/a	You figure things out	n/a	They are connected	They are definitely related
Donna	It is the best job	It is my dream job	Having creativity and good judgment	Teaching is research	They go hand-in-hand	They are definitely related
Eric	It is everything	It is everything to me	Being a teacher is more important	Helps me improve my teaching	Certainly they are integrated	Yes, they are integrated
Fred	To have an effect on the students	It means a lot	Not having to tell they students what to do	Directing a group of students	Yes they are integrated	They are enormously related
Jack	To organize and challenge students	It is a great job	To work on something unique	A chance to exercise intellect	A balancing act	It is a creative act to integrate them
Janice	To be a role model	Being a role model	Educational research	It is how you see the world	Sure they are integrated	Yes they are integrated
Justin	It is a job and I get recognition	It is worthwhile and fulfilling	It takes different skills than teaching	It is another modality of teaching	Not really integrated	Teaching informs my research
Kathy	To listen and learn	A learner with the students		Educational research	Certainly integrated	I think they are integrated
Keith	Be a facilitator	Communicate knowledge	Educational research	Develop new teaching approaches	Yes they are integrated	Integrate research into teaching
Kim	Be sure students are learning	For students to understand concepts	To try new techniques	Prepare for the future	Yes they are integrated	I think about if my research can be applied to teaching
Michael	Impart knowledge, be role model	Teach students to be professional	I'm not a researcher	Don't do much research	Influenced by research around me	I do research on teaching
Scott	Try to get students interested	Help people think	Ask questions and find answers	Discover new things	They are integrated	Teaching influences my research
Shelley	Be a communicator	Conveyor of knowledge	Constant searching	See what needs to be understood	They are integrated	Absolutely

5.3.3.3 Final Professional Identity

A second strategy I used to discover if any of the participants had experienced changes in their professional identities was to ask for their own opinions about change. During the final interview, I asked the participants if they felt that their sense of self as a teacher had changed since the initial interview, and if their sense of self as researcher had changed in that time.

Five participants stated that there were changes to their teacher and researcher identities, two stated there were changes in their teacher identity but not their researcher identity, and six of the twelve participants did not believe their teacher or researcher identities had changed over the semester. These responses vary from the conclusions drawn from the first strategy. When I compared the participants' responses to the initial and final interviews, the differences were mostly elaborations of the first response. When I used this first strategy I was reviewing responses. However, when reviewing responses the participants gave to specific questions regarding changes in their teacher or researcher identities, their responses showed that they recognized change and provided personal and specific information regarding changes. I compared these responses with their individual characteristics to determine if there were any relationships between self-reported identity changes and gender, rank, or experience.

Of the five individuals who reported changes to their teacher and researcher identities, four were tenure-ineligible and three had less than ten years of experience. These individuals provided details to their responses such as:

> I have been growing into more of a professional. The first semester I was teaching, I felt like I was still a graduate student. Now I have moved away from that. I think it was due to my situation, had I been at any other institution, I don't know if I would have the same feeling.
>
> As a teacher, I am always evolving; I don't think I would be a good teacher if that didn't happen. I am definitely changing as a researcher, looking into educational research. A lot of my colleagues are involved in research, and are teaching, but they are not looking at the "nitty gritties" of teaching courses, and that is what I am starting to look at.
>
> I am now more confident in myself as a teacher. I know that students appreciate the things that I have tried, based on the comments on my evaluations. I feel that they have a better learning experience because of what I have done. Since my research is guided by what I do in terms of my teaching, it is also improving.

These individuals shared changes that addressed their professional development; these were changes they saw as being positive and productive. Most of these individuals had less than ten years of experience and were continuing to progress in their teacher development.

The two participants who stated they had changed as teachers but not as researchers gave contrasting reasons that were likely related to their years of experience. A tenure ineligible faculty member with less than 20 years of experience stated that her identity as a teacher "changes all the time." She saw her professional identity as still developing, "I need to learn more and more to teach, even some of the things that I think I feel really comfortable with; sometimes I see myself more as a student in a lot of ways." In contrast, an emeritus faculty member said his teacher identity was "starting to deteriorate." He saw that his most productive years were behind him and that he was no longer the teacher he strived to be, "I got better until about four or five years ago, now I

feel like I have said the same things too many times. If you wanted to hear the best lecture I ever gave, it would be about three or four years ago."

A third group of participants reported no changes to either their teacher identities or researcher identities. Of the six individuals in this category, four were male; three were full or emeritus faculty, three were tenure ineligible, and their teaching experience ranged from less than 10 years to over 35 years. One individual stated

> There are not really any changes now. I tweak things a bit but basically I do the same things. I did have highs and lows like winning teaching awards and not have research proposal accepted. The students do change.

Another said,

> I don't think my goals have changed. I think my confidence has increased as well as my awareness of what is going on in the field, but I see that as experience.

A third individual expressed,

> Neither my teacher nor researcher identity has changed. My vision of how good I am goes up and down but I think the mean stays the same year to year.

These individuals did not see their professional identities changing over the course of a semester, especially those who had more years of experience.

After engaging in both analyses of change in professional identity, I decided to honor the participants' interpretation of change to their professional identity over my comparison of interview responses. The identification and explanation of any change to professional identity that the participants gave when specifically asked fits better with this particular study. I was interested in determining how each member of the community of practice would identify her professional identity at the end of the semester, and how each one made sense of any changes that occurred. While the combination of both

analyses provides a more holistic view of the final professional identity of the members of the community of practice, the interpretations gathered from the participants provided richer data and reflected their own individual sensemaking.

5.3.4 Teaching-as-Research and Overall Professional Identity

During the final interview, I asked the participants three questions about any group discussion about Teaching-as-Research: 1) how it may have affected their overall professional identities, 2) how they would describe the group's understanding of the concept, and 3) if they felt that the introduction of this concept had any impact on the conversations that occurred in the group.

As shown in Table 5-10, five participants acknowledged changes to their overall professional identities and attributed the changes to conversations about Teaching-as-Research, three saw some change in their identities, four felt there was no change, and one individual did not answer the question. Of the five individuals who reported changes to their overall professional identities, three also talked about changes to their teacher and researcher identities as reported in section 5.3.3.3. The other two individuals who reported changes to their overall professional identities that they attributed to the conversations about Teaching-as-Research had previously reported no change to their professional identity (in section 5.3.3.3). I have grouped these participants into three categories; change, some change, and no change.

Table 5-10: The effect of collective sensemaking about Teaching-as-Research on the individual participants' overall professional identities as teachers and/or researchers

Change	TAR utterances/ total individual utterances for Sessions 1-3	TAR utterances/total individual utterances for Sessions 4-12
Yes	0.0%	10.3%
Yes	0.0%	7.1%
Yes	0.0%	3.6%
Yes	0.0%	3.4%
Yes	0.0%	1.6%
Some	0.0%	49.7%
Some	0.2%	6.9%
Some	0.0%	0.0%
None	0.2%	7.4%
None	0.0%	0.3%
None	0.0%	0.0%
None	0.0%	0.0%
No answer	0.0%	14.9%

5.3.4.1Changed Overall Professional Identity

When the participants talked about the group's understanding of the concept of Teaching-as-Research and whether being introduced to the concept of Teaching-as-Research affected the group discussion, they had varying opinions. Of the five individuals who reported changes in their overall professional identities associated with the discussions of Teaching-as-Research, four were male and one female. Two were emeritus professors and three were tenure ineligible faculty members; their level of

experience was widely varied. Four of these five individuals were identified by other group members in the community of practice (during the initial interview) as influential to the group or themselves. One individual stated, “It (Teaching-as-Research) enlightens my teaching, and reinforced my intuitive ideas.” Another participant stated, “It informs me; learning and research permits me to be the teacher I desire to be.” Another stated, “I am changing my curriculum based on the process.”

All of the individuals who reported changes in their overall professional identities and attributed these changes to the conversations about Teaching-as-Research talked about the personal impact the conversations had on their professional identities. Their responses were focused on their continual growth as teaching professionals. Of these, five individuals had identified themselves as either primarily teachers (three of the five) or as integrated professionals (two of the five).

5.3.4.2 Some change in Professional Identity

The three individuals who indicated they experienced some change in overall professional identity because of talking about Teaching-as-Research were all tenure ineligible faculty members. Two were male and one was female. Two had less than five years of experience; the third had 10 to 20 years experience. Some of the comments they made include, “I have already been doing it,” and “teaching is an opportunity to do research.” I coded these responses as “some change” because Teaching-as-Research clarified work they were doing or had thought of engaging in. One of these individuals had over 49% of her Teaching-as-Research utterances during Sessions 4-12. Most of

these utterances occurred during Session Four when she discussed changes she had made to her curriculum as a result of feedback from her students. Another one of these individuals had no utterances related to Teaching-as-Research (he had very few communication utterances overall) which indicates that while he did not join in on the conversations regarding Teaching-as-Research, he was involved in individual sensemaking about the concept during these group interactions. The responses of these individuals focused on how discussions about Teaching-as-Research had reinforced their current beliefs and attitudes toward teaching. All three identified their professional identity as primarily that of a teacher.

In addition to the three individuals who talked about experiencing some change, there was one individual who had no response to the question of whether or not the group discussion about Teaching-as-Research affected her overall professional identity. As illustrated in Table 5-10, the topic of Teaching-as-Research comprised 14.9% of total utterances for this individual. Her Teaching-as-Research utterances occurred primarily during Sessions Six and Seven and were related to education research issues. She identified herself as an integrated professional during the initial interview, and stated that her research is primarily educational research. This participant learned about Teaching-as-Research during Session Four and recognized that it fit with her professional identity of an educational researcher. She engaged more in the conversations related to Teaching-as-Research during later sessions, and I would consider her to have experienced some change in her overall professional identity, as a result of this recognition of the relationship between Teaching-as-Research and educational research.

5.3.4.3 No change in Professional Identity

Of the four participants who felt that the discussion of Teaching-as-Research had no effect on their overall professional identities, three were full professors or emeritus faculty and one was a tenure ineligible faculty member. Three of the four were male and one was female. One of the individuals stated, “To say ‘Teaching-as-Research’ does not fit the way I think about things very well.” Another participant said that the presentation about Teaching-as-Research “was boring.” A third individual who stated that the conversations about Teaching-as-Research did not affect his overall professional identity engaged in the discussions around Teaching-as-Research. He was among one of the most verbal individuals in the community of practice, and contributed a lot to most of the conversations that took place.

Three of these four respondents said their professional identity was that of an integrated professional; the fourth identified as primarily a researcher. Two of the four who felt that the discussion of Teaching-as-Research had no effect on their overall professional identities stated that there had been no change to their professional identity during the semester; two stated they had experienced some changes in their teacher identity (one felt his teacher identity had deteriorated).

5.3.4.4 Identity Change and Communication

The individuals who stated they experienced at least some identity change after the Teaching-as-Research presentation engaged in talk within the community of practice about teaching as research one and a half times more, on average, than those who stated

that the discussion of Teaching-as-Research had no effect on their professional identity. In fact, only one of the four individuals in the "no change" group contributed a significant amount to that conversation. This leads to another working proposition that could be further investigated in additional research studies: Proposition 6: *The more an individual talks about a concept within a community of practice, the more likely the individual is to engage in individual sensemaking about the concept leading to individual change and learning. Possible exceptions include individuals who are generally quiet, or individuals who are generally talkative.*

5.3.5 Summary

Chapter Five addressed the research questions asked in this study and formulated working propositions based on the analysis of the data. Details were provided regarding the group interactions and the power, norms, and values that were evident. The individual and collective sensemaking that occurred were discussed. Reported changes in professional identity were also included. Chapter Six summarizes the findings from this study, discusses the implications for practice and theory, addresses the limitations, and provides recommendations for future research.

Chapter 6

Discussion, Conclusion, and Implications

In this chapter I review the purpose of this study, provide a summary of the research conducted, and formulate conclusions. I also examine the implications for practice and theory as well as for future research. The benefits and limitations of the study are discussed along with my conclusions.

6.1 Purpose of the study

Over the past ten years there has been a call by organizations such as the National Science Foundation (1996), and the National Research Council (1999, 2003) to improve undergraduate education in the fields of science, technology, engineering, and mathematics. It is especially difficult to address this task of improving undergraduate education at research universities because teaching effectiveness is not as valued as highly as research productivity (National Research Council, 2003). Historically, faculty members collaborate more about their research endeavors than about their teaching. Recent efforts have been made to bring groups of teachers together in communities of practice to discuss curriculum and teaching, but efforts in the sciences are lagging behind the other disciplines (National Research Council).

Educational communities of practice have developed to address issues such as teacher education, changes in departments, or curriculum issues. Research on these

communities of practice has focused on how learning takes place as well as the process of becoming a member (Lave & Wenger, 1991). However, previous research involving communities of practice has overlooked the effect of the group activity on individual members' professional identities (Hodkinson & Hodkinson, 2003). This dissertation addressed how the communication and collective sensemaking that occurs within a community of practice may affect participating individuals' professional identities.

This dissertation provides insight into the nature of the communication that occurs within a community of practice. This dissertation also provides information about how the relative power of group members in a community of practice shapes the topic of communication and the opportunities for collective sensemaking about these topics.

The research questions examined in this study are:

1. How do the individual characteristics of participants in the community of practice, including rank, gender, ethnicity, expertise, and their professional identities affect interactions within the community of practice?
2. How do characteristics of the community of practice, including norms, values, relative power of members, and the nature, topics and types of communication, influence individual and collective sensemaking?
3. How, if at all, are the professional identities of individual members modified by individual and collective sensemaking about a concept new to the community of practice?

6.1.1 Summary of methods

This study used a case study approach that included direct observations of the community of practice for twelve sessions. The focus was on how the individuals made sense of what occurred within the group and how their participation influenced their professional identities. A case study involving the entire population was used so that working propositions could be derived and results used to build or extend theory (Eisenhardt, 1989).

The observations allowed me to gather data directly on the topics and types of communication that occurred during each session. In addition, each individual participant was interviewed twice; once at the beginning of the observations, and again after the twelve sessions were completed. By interviewing the participants a second time, I was able to ask them directly for their perceptions about changes they believe occurred to their professional identities.

6.1.2 Summary of the findings

The qualitative research methods used for this study do not test theories; rather, the findings add to theoretical knowledge. I derived several working propositions from the findings of this study. These working propositions were discussed within Chapter Five. In the following sections, I review each proposition and discuss their implications for theory and practice.

6.1.2.1 Participation within an educational community of practice

Participation within a community of practice may benefit instructors in several ways. It provides contact with others who have new knowledge about teaching, exposes them to the teaching experience of others, provides them with emotional support, and the opportunity to learn about new teaching skills and to share their own innovative teaching ideas. The characteristics often found in a community of practice include sharing ideas, a sense of community, equal responsibilities for the members and ongoing reflection about the interaction of experience and knowledge (Buysse, et al., 2003; Wenger, 1998). Lave and Wenger (1991) also discuss participation in a community of practice when they refer to the concept of legitimate peripheral participation. This concept involves the process whereby a newcomer becomes part of a community of practice through a type of apprenticeship (Lave & Wenger, 1991). As an apprentice, an individual with minimal experience may tend to watch the group interactions, and speak less than other members of the group. Lave and Wenger describe the communities of practice developmental cycles as newcomers becoming full practitioners, then gradually moving to being old-timers. One emeritus faculty member in my study described the process as he experienced it

> I helped lay the foundation and provide the building blocks. Later we got new blood so I could go… and polish that apple.

This participant's description of his experience in the community of practice is one piece of evidence contributing to the working propositions I developed regarding participation in communities of practice:

1. Instructors who are in the midst of their careers will participate more actively in an educational community of practice than individuals who are at the beginning or near the end of their careers.

2: Instructors who are at the highest academic rank will participate more actively in an educational community of practice than individuals who are emeritus faculty members or tenure-ineligible faculty members.

Experience and academic rank were the individual characteristics that were associated with the overall frequency of interaction within the community of practice. Those individuals who were mid-career professionals spoke more frequently than those who had less than ten years or more than 30 years of experience. The individuals who had less than ten years of experience were all tenure ineligible and those with more than 30 years were either emeritus or had full tenure. The participants who were most talkative included both tenure ineligible and full professors. It was difficult to tease out the relative influence of experience and academic rank because of the small number of participants in this study.

Professional identity did not appear to be associated with the overall frequency of communication within this community of practice. There were also no apparent patterns of relative overall frequency of participation associated with gender, although previous research (Hibbard & Buhrmester, 1998; Reevy & Maslach, 2001) indicated that women's participation would be affected by gender role socialization (they would tend to speak less often than males). However, for this community of practice, the number of utterances for both males and females ranged from minimal to a significant amount, as discussed in Chapter Five (5.1.1).

Possible benefits from having those who are in the midst of their career dominate the conversation may follow because they have a great deal of expertise. However, that also means that opportunities for sharing new ideas from those with less experience or the traditions and wisdom of those with more experience may be reduced. Although those with minimal experience as well as those with a great deal of experience may not be as verbal as those in the midst of their careers, they may be learning and contributing in other ways. An example of benefit to a newcomer is evident in the statement made by a new instructor about this community of practice:

> I had never seen an environment like this before. They are just such a giving group. They are more than willing to help you find out. There is great collaboration in the group; you can share everything. It's very friendly and you should not be scared.

My findings regarding those group members with less experience support the "apprenticeship" concept discussed by Lave and Wenger (1991) about newcomers to a community of practice and their level of verbal participation. Additionally, those group members with a great deal of experience may be similar to those individuals Lave and Wenger (1991) call "old-timers". One of the emeritus faculty members stated that,

> With this group, when there is a lot of talking going on, more often than not, when I say something, nobody hears me.

Encouraging both those with less experience and those with more experience to increase their participation in the community of practice would need to involve all members of the group. Those in the midst of their career should encourage participation by others, as when the Organizer and the Sage encouraged Donna and others with less experience to talk about their efforts in curricular and teaching improvements. The encouragement evidenced within this community of practice moves beyond the current

literature and suggests that relationships among members may help increase participation by those who are newcomers or old-timers.

6.1.2.2 Informal power in a community of practice

Educators tend to emphasize equal responsibility and the absence of formal leadership in communities of practice (Buysse, et al., 2003; Pugach, 1999). Similarly, Brown and Duguid's (2001) distillation of Lave and Wenger's description of communities of practice as locales for learning does not recognize how power may influence what occurs within a community of practice. Contu and Willmott (2003) argue that issues of relations of power need to move from the periphery of the community of practice discussion, and pose the challenge for researchers to examine how relations of power occur within a community of practice.

Accepting that challenge, this study explored how individual power differences, expressed through patterns of communication, shaped opportunities for collective learning in a community of practice. The results of the study led me to two working propositions that are related to informal power or influence in a community of practice:

3: Individuals who frequently interrupt others are less likely to be viewed by other members of a community of practice as having power or influencing others.

4: An individual in a community of practice, who initiates and contributes new conversations more than other members, will informally set the agenda by influencing which topics are discussed within the group.

The members of the community of practice identified respect and collegiality as group norms. There were minimal interruptions in the conversations of the group members, most of which were supportive or neutral in nature. The two individuals, who made the most interruptions, whether or not they spoke relatively frequently, were rarely identified as being influential. This finding supports research by Karakowsky and others (2004) that found that group members who interrupt are less likely to be viewed as leaders by other members in the group. In addition to supporting previous research, this study also demonstrates how group members who disregard the norms of the group (respect and collegiality) by frequently interrupting others, are less likely to be viewed as influential.

While an informal community of practice may not have a formal power structure, Huzzard (2004) asserted that there is likely to be an informal sense of influence among the group members. Through their communication, dominant participants may be more active in constructing any learning that occurs in the group (Huzzard). Even when there is no formal structure in a group, one or two individuals may emerge as informal leaders and will direct the topic of conversations in the group.

There were two individuals who were identified as influential by other members of this community of practice. The individual who had a higher frequency of utterances, the Organizer, had a more lasting effect than the relatively quiet Sage on the topics of communication by initiating and leading discussions. The topics of discussion that occurred most frequently in the group, teaching and administration, were also topics that the Organizer spent most of his time talking about. During two of these conversations, the members of the community of practice engaged in collective sensemaking. This supports

research by Hirokawa and Pace (1983) that states that groups contain at least one member who is able to influence the topic of discussion.

This study provides additional insight into how power helps to shape conversations that occur within a community of practice and the direction in which the communication proceeds. Participants in the community of practice asked the Organizer about agenda items, and he was described as "organized and taking care of things." One example, as discussed in Chapter Five (5.2.3), involved the Organizer manipulating the agenda or conversation topic in a session. He suggested the group should discuss Teaching-as-Research and this suggestion was reinforced by another participant. After a short conversation about Teaching-as-Research, however, the direction of the conversation changed when the Organizer responded to another participant's question about curriculum changes. The Organizer continued the discussion about curriculum revisions and other group members joined in. Conversations that the Organizer initiated tended to last longer than those initiated by other participants. His frequent initiations regarding administrative issues during Session Eight and subsequent sessions contributed to the substantial amount of overall group utterances regarding administrative issues during the last five sessions the community of practice was observed.

Based on my findings, it may be in the best interest of a community of practice to designate a member of the group to be the informal leader. A community of practice should take the time to make a collective decision regarding leadership rather than passively allowing several group members to waste valuable meeting time competing for the role. In my study, the Organizer was the informal leader. Other members of this community of practice identified the Organizer as being influential and looked to him for

an agenda and to lead discussions. If the community of practice does not designate a leader, the result may be either a member with hidden power who manipulates the agenda or periods of “non-decision making” (Bacharach & Baratz, 1962).

Further research could be conducted on other communities of practice to determine how differences in the individual characteristics of the group members might affect the informal power in the group and the learning that occurs.

6.1.2.3 Collective sensemaking within a community of practice

Sensemaking, according to Weick (1993) is the retrospective process of trying to understand or assign meaning to actions taken or something that has happened in order to plan for the future. Collective sensemaking is a process in which members of a group (or community of practice) work to make meaning out of a situation or circumstances that are unclear or ambiguous (Kezar & Eckel, 2002; Weick, 1995). During the process of collective sensemaking, the group members become committed to an issue; that is, their actions become voluntary, public, and explicit (Weick, 1993). In regards to the conversations that occurred in this community of practice and the process of collective sensemaking, I found the following relationship:

Proposition 5: Members of a community of practice are more likely to be involved in collective sensemaking about an issue when it involves a need for them to make a decision, their commitment to take voluntary action, and efforts to present their plan explicitly to an external individual or group.

This community of practice discussed several issues throughout the semester; Teaching-as-Research, a new major offered in the College, the use of online resources to help with teaching, grading graduate students who worked as TAs, and use of space the department acquired from the College. Four of these five issues related to teaching, the fifth was an administrative issue. As discussed in Chapter Five, collective sensemaking occurred with two of these issues when the members of this community of practice *voluntarily* decided to *commit* to an *action* that then would be *explicitly* shared *publicly*, to an external individual or group.

The members of the community of practice were engaged in collective sensemaking regarding grading TAs and the space the department was acquiring from the College. Both of these issues involved committed interpretation by the group; they voluntarily made the changes, were explicit in the decision process, and planned to make these decisions public. The TA issue was to be discussed with other faculty members, and the space issue was to be presented to the College administrators. The concern of grading and the request for additional space were both issues that the group members decided should be resolved. It is important to recognize that the decision made needed to be explicitly shared publicly within the larger system that the community of practice is located. In contrast, the community of practice did not feel the need to make collective decisions about Teaching-as-Research, use of online resources to help with teaching, or the new major being offered in the College. Members perceived these issues as less urgent, and therefore they took a backseat to more pressing issues in the group discussions.

These findings may be helpful to department heads or administrators who are interested in encouraging a department or community of practice to adopt a new concept or procedure. According to Buysse and others (2003), educational communities of practice have developed to address issues related to teacher education and integrating educational research and practice. Additionally, funding sources such as the National Science Foundation are investing in research that focuses on how to transfer the concepts used in research to teaching practices. The results of my research indicate that a group should have the opportunity to engage in collective sensemaking about a concept in order for them to adopt it and put it into practice. For example, if a teaching and learning center at a university has developed a new practice for teaching large classes that has benefited the science department and they would like the psychology department to use this same concept in their teaching, simply introducing the new concept to the instructors in psychology would not guarantee their buy-in or use of the new teaching technique. However, if the group of psychology instructors were introduced to the concept, provided with evidence of its benefits to the science department, and then encouraged to come up with their own plan to implement the technique, there would be more opportunity for collective sensemaking to occur. The group of psychology instructors would need the opportunity to make a *voluntary* decision to *commit* to an *action* (whatever plan they develop) that then would be *explicitly* shared *publicly*, to an external group (the teaching and learning center). Future research could also be conducted to determine if this strategy increased the adoption of new concepts compared to the strategy of introducing a strategy and assuming it will be adopted by the department.

6.1.2.4 Individual Sensemaking and Changes in Professional Identity

Individual sensemaking occurs as one looks backwards at an action or decision made, and tries to understand it in order to move forward (Weick, 1993). In a group setting, individual sensemaking may also involve what a group member thinks about the communication within the group as well as their own experience outside the group. The results of my research led to the following working proposition regarding individual sensemaking:

Proposition 6: The more an individual talks about a concept within a community of practice, the more likely the individual is to engage in individual sensemaking about the concept leading to individual change and learning. This finding supports previous work by Printy (2002) that states that there is a significant relationship between an increase in teacher learning and competence and membership in a community of practice when the teacher participates in group discussions and interacts with other members. Changes, including those in instructional practices however, may happen slowly (Bidwell, 2001). Possible exceptions to this proposition about level of group participation and individual sensemaking include individuals who are generally quiet, or individuals who are consistently talkative. One illustration of these exceptions may be found in a classroom setting. The quiet student who sits and listens to the discussion but has minimal verbalizations may still be engaged in processing or individual sensemaking about the topic of discussion. Conversely, the student who actively engages in conversation frequently, but without much reflection may not understand or be able to grasp the concept being discussed.

This community of practice at Woodland University was comprised of instructors for undergraduate science courses who have voluntarily chosen to meet and discuss their teaching in an effort to improve their skills. Their commitment to teaching was demonstrated by the fact that they spent almost half of their time during the observed sessions discussing teaching (2023 of the total 4106 utterances). In addition, another 7% of the total group utterances (286 of 4106) were coded as Teaching-as-Research. During these discussions, the instructors shared innovative teaching strategies they employed, methods to improve or streamline grading, and ideas for increasing student participation in large introductory classes.

Eight of the thirteen members of this community of practice stated that the conversations regarding Teaching-as-Research had an effect on their professional identities. These individuals engaged in conversations within the community of practice about Teaching-as-Research one and a half times more, on average, than those who stated that the discussions about Teaching-as-Research had no effect on their professional identities. Individuals who indicated they experienced at least some change in their identities because of conversations about Teaching-as-Research talked about the personal impact for them. Some discussed their continual growth as teaching professionals, while others focused on how the discussions reinforced their beliefs about teaching. Those who stated that the discussions of Teaching-as-Research had no effect on their professional identities did not discuss a connection between the concept and their own teaching.

I saw little evidence of collective sensemaking involved in the discussions about Teaching-as-Research. However, as discussed in Chapter Five (5.3.1), the members of the community of practice did engage in individual sensemaking about Teaching-as-

Research. They *interpreted* their understanding of Teaching-as-Research, *voluntarily* and *explicitly* defined the concept based on their own experiences, and did so in a *public* setting (their interview with me). This supports Schön's (1983) theory of professional development and reflection-in-action; instructors' reflection about current experiences may affect their professional identities. It also supports research by Buysse and others (2003) that being a member of a community of practice may foster individual growth through collaborative relationships and activities.

6.2 Benefits and limitations of the research

As is the case in any research conducted, there are both benefits (things that assist) in the research process and limitations that may hinder the process. I address both in the following sections.

6.2.1 Benefits

Approaching this research as a case study both benefited and limited the research. By conducting an indepth case study, I was able to obtain a great deal of rich data over the semester that I studied this community of practice. I included thirteen group members (out of fourteen) who met the criteria I had established for participants (attending at least half of the sessions and participation in initial and final interviews). Once I had finished observing twelve sessions, I had over 4000 utterances to code from over 12 hours of meeting time. I also gathered information on each participant in the 26 interviews I

conducted, some of which lasted over an hour and a half. In addition, my field notes helped me to distinguish each individual's voice in conversations from the taped sessions, and I was also able to make notes of the nonverbal behaviors that occurred during the sessions. All of this information added to the richness of my data when I faced the task of analyzing and making sense of it.

Conducting this research as a single investigator, I was able to gather all the data first hand. I developed the categories for coding the topics and types of communication and defined them clearly. While it made the process somewhat overwhelming at times, I was sure that the utterances were all being coded according to the same decisions. The observation data collected for this study provided an in-depth look at a specific community of practice and how it operated. This approach is not widely used when studying academic communities of practice. The results of this study make a significant contribution to understanding how the process of communication within a community of practice affects the individual and collective learning of participants.

Finally, engaging in a case study allowed me to develop working propositions from the data. The propositions were based on the data gathered from my case study research and they focus on relationships between concepts (Eisenhardt, 1989; Strauss & Corbin, 1990). These propositions can then be tested in studies that involve other communities of practice, and thereby contribute to the understanding of communities of practice.

6.2.2 Limitations

One of the limitations of using a case study approach is that the results are not generalizable to any population. The findings however are generalizable to working propositions. These propositions may be tested with other communities of practice and other groups.

Another limitation was that there was only one researcher involved in gathering and analyzing the data. Having more than one investigator helps to bring different perspectives on the observations (Eisenhardt, 1989). This limitation was mitigated by reviewing my coding of the data with my advisor.

A related limitation is that this is a single case study of one community of practice. The working propositions did not involve comparing members of different communities of practice but rather they were based solely on this community of practice.

Another limitation to this research is the time frame. I observed this community of practice for one semester. A semester is only a slice of the fourteen years that this community of practice has been in existence. This affects the results and propositions that I have formulated based on my research. For example; the impact of Teaching-as-Research may have been overshadowed by administrative issues towards the end of the semester; however, that may be a temporary issue. I was informed that in subsequent semesters, the discussion shifted to evaluating tenure ineligible instructors. As events arise and they are brought to the attention of this community of practice, the conversation shifts.

Finally, the lack of ethnic diversity in this community of practice is a limitation. Future research may focus on a community of practice that is more diverse in order to compare the results from this study. This would help to determine if ethnicity is another individual characteristic that effects the interactions within a community of practice.

6.3 Conclusion

A focus of this study was on how a community of practice understood the concept of Teaching-as-Research, and whether or not the members engaged in collective sensemaking about the concept. After Teaching-as-Research was introduced to this community of practice, I observed their group sessions to determine whether or not the group members engaged in collective sensemaking about the topic. The results of this study are helpful for future practice because they clarify in what situations collective sensemaking does or does not occur. I could explain this process by saying that I engaged in Teaching-as-Research about sensemaking regarding the concept of Teaching-as-Research. Teaching-as-Research involves using research methods to implement new teaching practices, studying them, and evaluating whether or not the practice worked.

For this study, I was instrumental in introducing the concept of Teaching-as-Research and I observed the community of practice. My analysis indicated that the community of practice did not engage in collective sensemaking about the concept. Therefore, if I wanted to encourage the group to engage in collective sensemaking about Teaching-as-Research, I would need to use a different approach. I would present the concept of Teaching-as-Research to the group of faculty members, provide them with

evidence of its effectiveness, and then ask them to develop a plan to implement the concept. Others may use these lessons learned to foster change in academe by encouraging faculty to make meaningful and important collective decisions about their work with students.

Teaching-as-Research bears a resemblance to the Scholarship of Teaching and Learning. Both ideas focus on improving teaching and learning by evaluating the teaching process. The Scholarship of Teaching and Learning movement is spreading throughout institutions of higher education in the United States (Cambridge, 2004; Hutchings & Shulman, 1999). While it is important that faculty members research and improve their teaching (Cross, 1998; Hutchings & Shulman, 1999) it is unlikely that all teachers are interested in doing so. With the continuing focus on the Scholarship of Teaching and Learning, to which Teaching-as-Research is related, it is important to study and understand when and why attempts to engage groups of faculty members in this process may be more or less successful. My dissertation study provides one example of an attempt that was only moderately successful and offers suggestions to improve future endeavors. While this community of practice did not always engage in collective sensemaking regarding Teaching-as-Research, it is essential to remember that individual sensemaking about this concept led to self-reported change in several members' professional identities.

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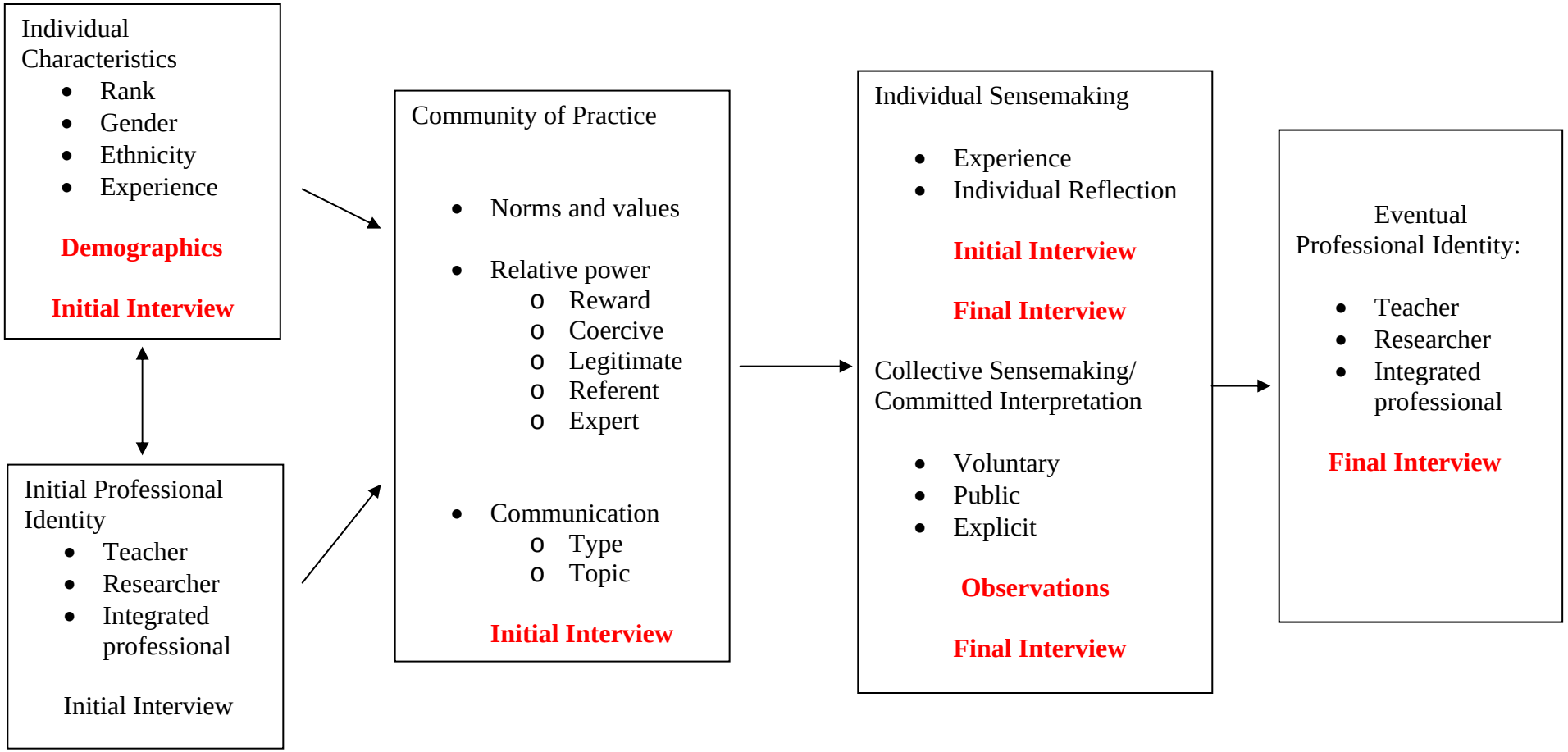
Appendix A

Data Collection



Appendix B

Initial Interview Guide

Thank you for agreeing to participate in this study regarding a community of practice. The purpose of this study is to understand how the process of sensemaking within a community of practice affects an individual instructor's professional identity as a teacher, researcher and the integration of these two roles. Two kinds of information are therefore critical to this study: information regarding your characteristics as an individual and information about your professional identity. To obtain the first kind of information, I will ask you several questions about your background and training. To obtain the second kind of information, I will ask you questions regarding your identity as a teacher, researcher and the possible integration of the two roles. In addition, over the next several months, I will observe your community of practice. The most important information I need is what you think. Your participation is totally voluntary. You can change your mind about participating in this interview at any time or decline to answer any question. In my dissertation, I may quote you, but I will not use your name, the name of this institution, nor any descriptors that may make it possible to identify you. Please review the consent form. There are two copies -- one for you to sign and return to me; one for you to keep.

First I am going to ask you some questions regarding your identity as a teacher, researcher and the possible integration of the two roles.

1. How long have you been teaching undergraduates? (expertise)
2. What has contributed most to your development as a teacher? (teacher identity)
3. What does it mean to you to be a teacher? (teacher identity)
4. What would you say are your strengths as a teacher? (teacher identity)
5. To what extent does your current professional assignment emphasize teaching undergraduates?
6. Please describe one of your best experiences as a teacher. (expertise)
7. How long have you been performing research? (expertise)
8. What has contributed most to your development as a researcher? (researcher identity)
9. What does it mean to you to be a researcher? (researcher identity)
10. What would you say are your strengths as a researcher? (researcher identity)
11. Please tell me about one of your most exciting times as a researcher?
12. For you, is teaching or research more important? Why? (professional identity)
13. How do your roles as a teacher and a researcher influence each other? (If they do) Please describe a situation where they were influencing each other? (integrated professional)
14. Is there anything else about who you are as a professional that you believe I should know?

Now I am going to ask you several questions in regards to your membership in the community of practice).

1. How long have you been a member of the group?
2. How did you first become involved?
3. Since you have been a member of the group, what are the most important topics of communication? Please explain to me how you can tell? (communication)
4. What are some of the unwritten rules for behavior among members of the group? Please give me an example. (norms)
5. What would you say are core values that animate the group? (values)
6. In your perception, which individual(s) has (have) had the greatest influence on the group as a whole? Please tell me why you believe (name/names) has so much influence? (relative power)
7. Which individual in the group has the greatest influence on you personally? Why? (relative power)
8. Is there anything else about the group you think is important for me to know?

Additional Question: Could you please explain what the concept of "Teaching-as-Research" means?

Appendix C

List of Terms and Codes for Observation Record

Topic of Group Communication:
Teaching (T): Statements or questions related to the teaching
Research (R): Statements or questions related to research
Teaching as Research (TAR): Statements or questions related to teaching as research
Procedural (P): Statements or questions related to mechanics of the group
Logistics (L): Discussion of other meetings, schedules and dates, not the group meeting itself
Administrative (A): Issues related to purchases of equipment, monies
Off-task (O): Statements or questions that are not related to teaching, research, or other issues the group is processing

Types of Communication:
Initiation (1): earliest mention of a specific issue
Restatement (2): repeating a statement/question
Asking for restatement (3): asking for something to be repeated
Clarification (4): development of an idea through elaboration, example or explanation
Asking for clarification (5): asking for an explanation of an idea
Substantiation (6): offering proof or evidence
Asking for Substantiation (7): asking for proof or evidence
Modification (8): revising an idea
Asking for modification (9): asking for the revision of an idea
Acceptance (10): accepting an idea
Asking for acceptance (11): asking others to accept an idea
Rejection (12): rejection of an idea
Asking for rejection (13): asking others to reject an idea
Synthesis (14): making connections between ideas
Asking for synthesis (15): asking someone to present the connection
Summary (16): paraphrasing
Support (17): helping or praising

(Adapted from Campbell, 2001)

Appendix D

Observation Record for Community of Practice

Meeting Date _____ **Page _____**

Utterance	Initials	Rank	Gender	Experience	Topic of Comm.	Type of Comm.	Values	Notes

Appendix E

Final Interview Guide

Similar to the discussion we had during the first interview in September, I am going to ask you questions about your professional identity and also your membership in the group.

First, I am going to ask some questions regarding your identity as a teacher, researcher and the possible integration of the two roles.

1. What does it mean to you to be a teacher? (teacher identity)
2. What does it mean to you to be a researcher? (researcher identity)
3. How do your roles as a teacher and a researcher influence each other? (If they do) Can you describe a situation where they were influencing each other? (eventual integrated professional)
4. Please describe one of your best experiences as a teacher this semester. (expertise)
5. Can you tell me about a time when you felt as if something you knew about yourself as a teacher changed?
6. Were there times when you felt as if your identity as a teacher became stronger? Less strong?
7. Please tell me about one of your most exciting times as a researcher this semester?
8. In your perception, how, if at all, has your sense of yourself as a teacher changed since we first talked in September? If it has changed, what do you believe contributed to this change? (individual sensemaking and eventual teacher identity)
9. In your perception, how, if at all, has your sense of yourself as a researcher changed since we first talked in September? If it has changed, what do you believe contributed to this change? (individual sensemaking and eventual researcher identity)
10. Has your sense as a researcher ever changed? Why or why not?
11. Is there anything else about who you are as a professional that we have not discussed that you believe I should know?

Now I am going to ask you several questions in regards to your membership in the community of practice.

1. Late in September, a visitor talked to the group about teaching as research, would you please explain this concept to me? (topic communication)

2. How, if at all, has learning about Teaching-as-Research affected your role as a teacher? As a researcher? (eventual teacher identity and eventual researcher identity)
3. How, if at all, did the group's discussions of Teaching-as-Research affect your professional identity? (individual sensemaking and eventual integrated professional)
4. How would you describe the group's understanding of the concept of Teaching-as-Research? (sensemaking)
5. What, if any, do you see as the impact of the introduction of this concept on the discussion among members of the group? (sensemaking)
6. What other concepts have had an important impact on the group?
7. Is there anything else about the group that we have not discussed, that you think is important for me to know?

Appendix F

Topic and Type of Utterances by Session

Session #1	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Acceptance	Rejection	Ask for Rejection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		9	3	1	104	40	19	2	27	2	35		10		2		2	2	**258**
Research		1			6	1			1		1								**10**
TAR					2		1												**3**
Procedure		4			1	3					1								**9**
Logistics		1			8	2					4				1				**16**
Admin		4			22	9	1		2		1		1				2		**42**
Off-task	34																		**34**
Total	**34**	**19**	**3**	**1**	**143**	**55**	**21**	**2**	**30**	**2**	**42**	**0**	**11**	**0**	**3**	**0**	**4**	**2**	**372**
Session #2																			
Teach		8	1	1	61	23	10	4	17		7	1	5		3	1	2		**144**
Research																			**0**
TAR																			**0**
Procedure		2	1		19	7			1		2								**32**
Logistics					4	2													**6**
Admin																			**0**
Off-task	23																		**23**
Total	**23**	**10**	**2**	**1**	**84**	**32**	**10**	**4**	**18**	**0**	**9**	**1**	**5**	**0**	**3**	**1**	**2**	**0**	**205**

Session #3	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Acceptance	Rejection	Ask for Reiection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		2	3	2	98	49	9		7		8		3		2		1		**184**
Research																			**0**
TAR																			**0**
Procedure		3			15						1								**19**
Logistics																			**0**
Admin																			**0**
Off-task	7																		**7**
Total	**7**	**5**	**3**	**2**	**113**	**49**	**9**	**0**	**7**	**0**	**9**	**0**	**3**	**0**	**2**	**0**	**1**	**0**	**210**
Session #4																			
Teach		3			17	3	4		2				3		1				**33**
Research		1			1	3		1					1						**7**
TAR		6			12	3	1		2		2		1		1				**28**
Procedure					5	2													**7**
Logistics		2			2														**4**
Admin																			**0**
Off-task	1																		**1**
Total	**1**	**12**	**0**	**0**	**37**	**11**	**5**	**1**	**4**	**0**	**2**	**0**	**5**	**0**	**2**	**0**	**0**	**0**	**80**

Session #5	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Accentance	Rejection	Ask for Reiection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		3			59	10	11	1	13		18		4		1		3		**123**
Research																			**0**
TAR		2			7	2			1										**12**
Procedure		4			31	11			3		3		2				1		**55**
Logistics					14	4			4										**22**
Admin		1			8	1					1		2						**13**
Off-task	65																		**65**
Total	**65**	**10**	**0**	**0**	**119**	**28**	**11**	**1**	**21**	**0**	**22**	**0**	**8**	**0**	**1**	**0**	**4**	**0**	**290**
Session #6																			
Teach		6	1	2	143	54	13	3	17	1	14		11				1	2	**268**
Research		1			19	5					1		1						**27**
TAR		3			11	3			2		2								**21**
Procedure																			**0**
Logistics		1			4	3					1								**9**
Admin																			**0**
Off-task	17																		**17**
Total	**17**	**11**	**1**	**2**	**177**	**65**	**13**	**3**	**19**	**1**	**18**	**0**	**12**	**0**	**0**	**0**	**1**	**2**	**342**

Session #7	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Accentance	Rejection	Ask for Reiection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		2	1	1	69	13	8		7		13		3		2		1		**120**
Research																			**0**
TAR		3	2	2	98	40	12	3	9		16		2		1		1	6	**195**
Procedure		3			3	1					2								**9**
Logistics																			**0**
Admin																			**0**
Off-task	35																		**35**
Total	**35**	**8**	**3**	**3**	**170**	**54**	**20**	**3**	**16**	**0**	**31**	**0**	**5**	**0**	**3**	**0**	**2**	**6**	**359**
Session #8																			
Teach		1			7				1		1								**10**
Research																			**0**
TAR																			**0**
Procedure		1			1	1													**3**
Logistics		1			4				1		7								**13**
Admin		5	1	1	194	52	11		26		47		5		4		2	3	**351**
Off-task	46																		**46**
Total	**46**	**8**	**1**	**1**	**206**	**53**	**11**	**0**	**28**	**0**	**55**	**0**	**5**	**0**	**4**	**0**	**2**	**3**	**423**

Session #9	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Accentance	Rejection	Ask for Reiection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		7			184	48	5		6		13						4	1	**268**
Research																			**0**
TAR		2			17	3	2				2						1		**27**
Procedure		1																	**1**
Logistics					5	3													**8**
Admin		3			149	35	2		6		18						1		**214**
Off-task	17																		**17**
Total	**17**	**13**	**0**	**0**	**355**	**89**	**9**	**0**	**12**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**6**	**1**	**535**
Session#10																			
Teach		14	4	4	96	25	6		10		19		2		3		2		**185**
Research		1																	**1**
TAR																			**0**
Procedure		1																	**1**
Logistics		1			4														**5**
Admin		3			34	10			1		4		3						**55**
Off-task	12																		**12**
Total	**12**	**20**	**4**	**4**	**134**	**35**	**6**	**0**	**11**	**0**	**23**	**0**	**5**	**0**	**3**	**0**	**2**	**0**	**259**

Session #11	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Accentance	Rejection	Ask for Reiection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		7			109	17	19		27		53		10		3		1	3	**249**
Research																			**0**
TAR																			**0**
Procedure		1			6	3													**10**
Logistics																			**0**
Admin		8			155	39	9		31		35		12		8		1		**298**
Off-task	83																		**83**
Total	**83**	**16**	**0**	**0**	**270**	**59**	**28**	**0**	**58**	**0**	**88**	**0**	**22**	**0**	**11**	**0**	**2**	**3**	**640**
Session#12																			
Teach		9	1	1	103	18	12	2	4		25		2		1		2	3	**181**
Research																			**0**
TAR																			**0**
Procedure		3			26	8	1		2		2		2						**44**
Logistics		1			12	2					1								**16**
Admin		7			56	15	6		14		17				1		3	1	**120**
Off-task	30																		**30**
Total	**30**	**20**	**1**	**1**	**197**	**43**	**17**	**2**	**20**	**0**	**45**	**0**	**4**	**0**	**2**	**0**	**5**	**4**	**391**

Grand Total	Off-task	Initiation	Restate	Ask for restate	Clarify	Ask for Clarify	Substantiate	Ask for Substantiate	Modify	Ask for Modify	Acceptance	Ask for Accentance	Rejection	Ask for Reiection	Synthesis	Ask for Synthesis	Summary	Support	Total
Teach		71	14	12	1050	300	114	12	138	3	206	1	53		18	1	19	11	**2023**
Research		4			26	9		1	1		2		2						**45**
TAR		16	2	2	147	51	16	3	14		22		3		2		2	6	**286**
Procedure		23	1		107	36	1		6		11		4				1		**190**
Logistics		7			57	16			5		13				1				**99**
Admin		31	1	1	618	161	29		80		123		23		13		9	4	**1093**
Off-task	370																		
Total	**370**	**151**	**18**	**15**	**2005**	**573**	**160**	**16**	**244**	**3**	**377**	**1**	**85**	**0**	**34**	**1**	**31**	**21**	**4106**

VITA

Lisa D. Weaver

Education

Ph.D., Higher Education Administration, The Pennsylvania State University May 2006

M.Ed., Counselor Education, The Pennsylvania State University August 1989

B.S., Individual and Family Studies, The Pennsylvania State University August 1985

Professional Experience

The Pennsylvania State University, 2002 - 2006
Graduate Research Assistant, Center for the Study of Higher Education

Mount Aloysius College, 1998 - 2002
Assistant Professor and Chairperson, Human Services Program
Adjunct Instructor, Center for Lifelong Learning

Northwestern Human Services, 1994 - 1998
Regional Training Director
Training Director
Staff Trainer

Professional Presentations and Service

Made five presentations at national conferences
Served as paper reviewer and meeting chair for professional organizations

Professional Memberships

Association for the Study of Higher Education
American Educational Research Association