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Iowa community college Science, Engineering and Mathematics (SEM) faculty: Demographics and job satisfaction

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**Iowa community college
Science, Engineering and Mathematics (SEM) faculty:
Demographics and job satisfaction**

by

Kathy Rogotzke

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Education (Educational Leadership)

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ABSTRACT

Community college faculty members play an increasingly important role in the educational system in the United States. However, over the past decade, concerns have arisen, especially in several high demand fields of science, technology, engineering and mathematics (STEM), that a shortage of qualified faculty in these fields exists. Furthermore, the average age of community college faculty is increasing, which creates added concern of an increased shortage of qualified faculty due to a potentially large number of faculty retiring. To help further understand the current population of community college faculty, as well as their training needs and their satisfaction with their jobs, data needs to be collected from them and examined.

Currently, several national surveys are given to faculty at institutions of higher education, most notably the Higher Education Research Institute Faculty Survey, the National Study of Postsecondary Faculty, and the Community College Faculty Survey of Student Engagement. Of these surveys the Community College Faculty Survey of Student Engagement is the only survey focused solely on community college faculty. This creates a problem because community college faculty members differ from faculty at 4-year institutions in several significant ways.

First, qualifications for hiring community college faculty are different at 4-year colleges or universities. Whereas universities and colleges typically require their faculty to have a Ph.D., community colleges require their arts and science faculty to have a only master's degree and their career faculty to have experience and the appropriate training and certification in their field with only a bachelor's degree.

The work duties and expectations for community college faculty are also different at 4-year colleges or universities. Community college faculty typically teach 14 to 19 credit hours a semester and do little, if any research, whereas faculty at 4-year colleges typically teach 9 to 12 credit hours a semester and are expected to conduct research and publish their findings.

In addition, community colleges often have what is referred to as an “open door” policy of admission meaning that students are not required to have a particular score on a college placement test, such as the ACT or SAT, nor are they required to have a specified high school grade point average or rank. Most 4-year colleges and universities require a minimum score on a college placement test in addition to a minimum high school grade point average or rank. Because of these differing entrance requirements, or lack thereof, community colleges often have a higher percentage of students needing remedial or developmental coursework.

This dissertation reports on data collected from a survey administered to full-time faculty at all 15 community colleges in Iowa. The survey was administered using Qualtrics software with assistance from the Office of Community College Research and Policy at Iowa State University. The results of the study were used to further examine who community college science, engineering and mathematics (SEM) faculty are in terms of their demographics and background, along with investigating factors from the survey that contribute to their overall job satisfaction. Multiple regression analysis on these variables along with gender and age examined different models for predicting overall job satisfaction.

CHAPTER 1. INTRODUCTION

Background and Significance

Community colleges are an increasingly critical component in the United States educational system. Not only are they educating a high percentage of undergraduates, but they also offer a very affordable option for those needing to further their training and education. According to the most recent statistics available, 44% of all undergraduates in the United States were enrolled in community colleges, and this number is expected to continue to grow (American Association of Community Colleges [AACC], 2011). Higher education and training are going to be critical for obtaining and keeping a well-paying job. In a report on projections of jobs and education requirements through 2018, researchers stated that “over the next five years, 60 million Americans are at risk of being locked out of the middle class, toiling in predominantly low-wage jobs that require high school diplomas or less” Carnevale, Smith, & Strohl, 2010, p. 2). Furthermore, “postsecondary education and training is no longer just the preferred pathway to middle and upper income classes it is increasingly the only pathway” (Carnevale et al., 2010, p. 4). Community colleges can help provide this needed education and training as they have already been doing.

Community colleges have been a part of the United States educational system for over 100 years. They serve their communities in a variety of ways. Cohen and Brawer (2003), well-known researchers and authors of an authoritative textbook on community colleges, identified four primary functions of community colleges: providing occupational education, collegiate and transfer education, remedial education, and adult and community education. Not all community colleges provide all types of education, varying, in part, according to the needs of the communities in which they are located and changing with the

needs of the times. In the 1960s, workforce and economic development were strong, whereas in the 1970s there was greater attention given to adult education and community services (Dougherty & Townsend, 2006). More recently, a strong interest in facilitating students pursuing a bachelor's degree has emerged, and some community colleges even are offering their own baccalaureate degree. These offerings can vary by geographical region; for example, community colleges in North Carolina have been strongly oriented to occupational training, whereas those in Florida has been focused on college degrees, with community colleges there fairly recently offering their own baccalaureate degrees (Floyd, Skolnik, & Walker, 2005).

At all community colleges, faculty are “the very heart and soul of community colleges” (Hardy & Laanan, 2006, p. 787). Having qualified faculty is critical for community colleges to provide a quality education to their students. However, there is a growing concern that there are not enough qualified faculty members, especially in the high demand fields of science, technology, engineering and mathematics (STEM; George, Neale, Van Horne, & Malcom, 2001). Hiring and keeping qualified STEM faculty in the current environment is especially challenging because they are in high demand for jobs, many of which pay more than a teaching position. Further compounding this problem is the “graying” of community college faculty, as a large number of current faculty members are expected to retire in the next decade (Barnett & San Felice, 2006) potentially leading to an even greater shortage of community college faculty.

To better understand community college faculty, particularly in disciplines facing potential shortages, this study examined data collected on community college faculty background and training, their experiences in the classroom, their workload, and their

satisfaction with their job. There have been numerous studies on faculty job satisfaction, but many of these studies used data from national surveys given to faculty at institutions of higher education. These surveys are aimed primarily at faculty teaching at 4-year institutions or universities, and few focus solely on community college faculty. Community college faculty members differ from faculty at 4-year colleges or universities in qualifications required, job expectations, and the students served.

Community college faculty who teach primarily transfer-level courses are required to have a master's degree in their field, whereas faculty teaching in the career areas need "relevant work experience," and often their highest degree earned is a bachelor's degree (Townsend & Twombly, 2007, p. 59). This differs from faculty at 4-year colleges and institutions who are usually required to have a doctoral degree because it represents "evidence that the holder has mastered certain content knowledge as well as in-depth research skills" (Townsend & Twombly, 2007, p. 59).

Community college faculty members spend about 85% percent of their work week on instruction, whereas university faculty members spend about 66% of their work week on instruction (Townsend & Twombly, 2007). Faculty research resulting in publication of the findings in their field of study is done by very few community college faculty (Townsend & Twombly, 2007). Ernest Boyer (1990), former president of the Carnegie Foundation for the Advancement of Teaching, broadened the definition of faculty research as the "scholarship of discovery" (p. 17). If the definition of faculty research is expanded to include what Boyer called "the scholarship of integration" (p. 19), "the scholarship of application" (p. 21), and "the scholarship of teaching" (p. 21), then more community college faculty members would actively participate in research. Unfortunately, there have not been any national studies that

have examined the extent to which these other types of research are occurring (Townsend & Twombly, 2007).

Community college faculty members often teach a higher percentage of students who need remedial or developmental coursework than do faculty at 4-year colleges or universities. In the fall of 2002, 42% of entering freshmen at community colleges needed remedial coursework compared to 20% at public 4-year colleges (Parsad, 2003). This is due, in part, to a hallmark characteristic of community colleges: their “open door” policies of admission. These policies help many strive for the American dream of a higher education, providing access for many who could not otherwise afford or qualify for higher education (Grubb & Associates, 1999).

Faculty at community colleges teach a wide variety of students who come with varying levels of preparation, motivation, and commitment. This is due in part to the expansion of community colleges’ missions, as they are providing an increasingly wider array of services to help meet the community needs (Outcalt, 2002a). As the missions of community colleges have expanded, the role of the faculty also has changed. Not only are faculty preparing students to transfer on to complete their bachelor’s degree, but they are also helping to prepare students for specific careers that do not require further higher education at a transfer institution, to further enhance their career opportunities, or to take remedial coursework (Townsend & Twombly, 2007).

The increased diversity of abilities and goals of community college students has generated discussions and some research about defining the appropriate training and qualifications for community college faculty. During the hiring boons of the 1960s, because many community college faculty were recruited from high schools to teach in the community

college system (Outcalt, 2002b), they had had coursework in pedagogy, education classes, and classroom teaching experiences. Several studies have indicated that this has changed. The majority of community college faculty members no longer come from the K–12 system (Townsend & Twombly, 2007). Even though faculty members who do not come from the K–12 system possess knowledge about their subject area because they are required to have a master’s degree or experience in their subject area, they lack teaching experience and have limited or no knowledge about pedagogy, classroom management, and best teaching practices. This can be problematic when the majority of their duties are teaching a diverse group of students in terms of preparation, abilities, and educational goals.

More data are needed about community college faculty, in particular information about their training, experiences, background, future plans, and job satisfaction. With this information a deeper understanding of community college faculty can be gained, which in turn can help community colleges recruit, train, and retain quality faculty members. As there is more emphasis on the seamless transfer of students between educational sections (high schools to community colleges to 4-year colleges), data about community college faculty can help provide a clearer understanding and appreciation of the role of community college faculty to faculty at other educational institutions.

Statement of the Problem

Community colleges play a vital role in the higher education system of the United States. Predictions indicate there will be a shortage of qualified workers in America (Carnevale et al., 2010), making it more difficult to remain competitive in the growing global market; therefore, providing postsecondary education and training is critical. Because community colleges are an important provider of both postsecondary education and

workforce training, they need qualified faculty members to provide these services. The current population of community college faculty is approaching retirement age. In fact, some estimate that about three-fourths of the full-time faculty at community colleges will retire within the next few years (Fleming, 2002). This shortage in the STEM disciplines is expected to be more severe and challenging due, in part, to increased competition for employees in these disciplines.

Due to the likely shortage of qualified faculty, coupled with the anticipation of a high percentage of retirements, recruiting and keeping qualified faculty in math and science will be a challenge. Understanding factors contributing to job satisfaction could help attract and perhaps retain faculty. Many of the studies conducted on job satisfaction have used data from several national surveys given to college faculty: the Higher Education Research Institute Faculty Survey, the National Study of Postsecondary Faculty, the National Faculty Survey of Student Engagement, and the Community College Faculty Survey of Student Engagement. Of these surveys, the Community College Faculty Survey of Student Engagement is the only survey that is given solely to community college faculty.

Examining data from a survey developed specifically for community college faculty can help in better understanding the backgrounds, current practices in teaching, factors that contribute to job satisfaction, and future intentions of community college faculty. This knowledge can help human resource directors and administration in determining appropriate qualifications and training for community college faculty, what support and professional development is needed and wanted, and finally, ways to satisfy and retain qualified faculty. This is especially critical in the STEM fields.

A 2005 report to the U.S. legislators on American's competitive position, popularly referred to as *Gathering Storm* (Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, & Institute of Medicine, 2005), and the 2010 follow up report, *Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5* (Members of the 2005 "Rising Above the Gathering Storm" Committee [Members], 2010), both emphasized the need for attracting students to STEM fields and improving the education offered in these fields. To help meet these recommendations, excellent, qualified instructors are needed in the STEM disciplines. This, however, is not an easy requirement for educational institutions to meet. According to a 2006 report by the American Association of Community Colleges, The American Mathematical Association of Two-Year Colleges, and the National Science Foundation,

one of the critical factors affecting the community college role in STEM education is the recruitment and development of community college STEM faculty. Community colleges face enormous challenges as they strive to find and retain qualified educators in the high-demand STEM fields. (Barnett & San Felice, 2006, p. i)

Purpose and Research Questions

Because community colleges are a critical component in the higher education system of the United States, having enough highly qualified faculty members in the STEM fields is a concern. This study examined primarily mathematics and science full-time community college faculty, investigating their demographics, backgrounds, qualifications, responsibilities, teaching practices, and job satisfaction. Because there were not enough faculty members who identified themselves as engineering faculty or technology faculty in

the survey administered, they were not studied as separate groups. Information from this study could help administrators and human resource leaders better understand how to attract and keep faculty by determining appropriate qualifications, training, and support needed or desired. Information from this study may help protect one of the largest investments of a community college—their faculty—and determine how to attract the best faculty at a time when it may be difficult to recruit faculty in some areas, such as science, engineering, and mathematics (SEM).

The following research questions were addressed in this study:

1. What are the demographic characteristics of community college full-time science, engineering and mathematics (SEM) faculty? Are there differences in gender, age, and race between SEM faculty and other arts and science (non-SEM) faculty? Are there differences in gender, age, and race between arts and science faculty and career and technology faculty?
2. What are the background qualifications and previous experiences of community college full-time SEM faculty? In particular, are there differences in degrees attained between SEM and non-SEM faculty? Are there differences in experiences in both secondary and postsecondary teaching between SEM and non-SEM faculty? Or between arts and science and career and technical faculty?
3. Are there differences in overall job satisfaction of community college full-time SEM and non-SEM faculty, or between arts and science and career and technical faculty?
4. What factors contribute to community college full-time faculty's job satisfaction? Is there a difference in how well the model predicts job satisfaction for arts and

science faculty compared to career and technical faculty? Does the model predict job satisfaction for SEM faculty better than for other arts and science faculty?

Hypotheses

For the first two research questions, descriptive statistics were used to examine the background characteristics, qualifications and experiences of community college full-time SEM faculty. To determine whether or not there are differences between faculty groups in background characteristics, qualifications and experiences, the null hypothesis was that there are no differences between faculty groups, and the alternative hypothesis was that there is a difference between faculty groups in demographics.

For the third research question, the null hypothesis was that there are no differences in job satisfaction between faculty groups, and the alternative hypothesis was that there is a difference between the faculty groups in job satisfaction.

Finally, the null hypothesis for the fourth research question was that none of the variables found in this study can be used to predict overall job satisfaction, and the alternative hypothesis was that there is at least one variable found in this study that can be used to predict overall job satisfaction.

Theoretical Perspectives and Conceptual Frameworks

Abraham Maslow's hierarchy of needs, initially published in 1943, and Frederick Herzberg's two-factor theory of motivation developed in the 1950s and 1960s (Herzberg, Mausner, Peterson, & Capwell, 1957) have been significantly influential in the quest to identify and understand job satisfaction. Both theories are based on the assumption that certain "lower" or most "basic" needs must first be met before other higher order needs can be obtained. Maslow's hierarchy of needs has five levels, often represented in a pyramid,

with the lowest level consisting of the most basic needs that are vital for survival, such as food, water and sleep. He called these needs physiological needs. The second level of needs includes those of safety and security, called safety needs, which can consist of the need for stable employment, health insurance, and a safe place to live. The third level, love or belonging needs, refers to needs that an individual has for acceptance in various groups and for relationships with love and affection. Esteem needs, the fourth level of needs, refers to an individual's need for recognition, a sense of personal worth, accomplishment, and achievement. The highest level of needs is called self-actualization. At this level, an individual has a need for personal growth but is no longer as concerned with the opinions of others. Maslow's (1943) work on motivation, further developed in his book *Motivation and Personality*, provided the foundations for Herzberg, Mausner, and Snyderman's (1959) qualitative research study on job satisfaction.

In Herzberg's et al.'s (1959) research study, accountants and engineers were interviewed and asked what pleased and displeased them about their work. From this research Herzberg et al. (1959) developed their dual factor theory in which they identified factors related to job satisfaction (motivators) and factors related to dissatisfaction (hygienes). Herzberg et al. (1959) identified status, opportunity for advancement, recognition, responsibility, challenging work, opportunity for growth, and a sense of personal achievement as motivators. They stated that motivators are elements of job satisfaction that arise from the nature of the work itself; others have referred to these factors as "intrinsic factors." Herzberg et al. (1959) identified agreement with company policies and administration, salary status, quality of interpersonal relations with peers and superiors, the quality of supervision, pleasant working condition, and job security as hygienes and stated

that hygienes are factors that arise from the work environment or conditions of employment. Others have referred to these factors as “extrinsic factors.” Herzberg et al.’s (1959) theory states that motivators and hygienes are distinct, hence the term “two-factor.”

Linda Hagedorn (2000) modified and expanded on Herzberg et al.’s (1959) model incorporating environmental conditions and life events along with mediators on a continuum. In Hagedorn’s model there are two constructs, called triggers and mediators, that interact together to affect job satisfaction. A trigger is defined as a “significant life event that may be either related or unrelated to the job” (Hagedorn, 2000, p. 6); and in Hagedorn’s model there are six unique triggers: (a) change in life stage, (b) change in family-related or personal circumstances, (c) change in rank or tenure, (d) transfer to new institution, (e) change in perceived justice, and (f) change in mood or emotional state. A mediator is defined as “a variable or situation that influences (moderates) the relationships between other variables or situations producing an interaction effect” (Hagedorn, 2000), p. 6). In her model Hagedorn also lists three types of mediators: (a) motivators and hygienes, (b) demographics, and (c) environmental conditions. Hagedorn’s model represents job satisfaction as a continuum and identifies three points on a continuum: disengagement on the left, acceptance/tolerance in the middle, and appreciation of job/actively engaged in work on the right.

Limitations and Delimitations

For this study, the sample was delimited to data from an electronic survey given to full-time community college faculty at each of the 15 community colleges in Iowa in the spring of 2011. The sample was obtained by asking a designated contact at each community college for a list of its full-time faculty and their e-mail addresses. The survey was e-mailed to all these faculty members. The faculty members could choose whether or not they wanted

to fill out the survey, and they could skip any questions that they did not want to answer. The variables used to assess job satisfaction were limited to those included in the survey instrument.

This study had the following limitations. The survey instrument was e-mailed only to faculty who were identified by each community college in Iowa as being full-time faculty members at their institution in the spring of 2011. Because the survey was disseminated and administered electronically, only faculty whose e-mail addresses were accurate and whose filters did not intercept the initial e-mail were able to respond. Only data from faculty who were interested, willing, and able to respond to the survey in the given timeframe was used. Even though the survey questions were reviewed by experts and tested, there still might have been questions that could be interpreted in various ways. The data from the survey were self-reported, so the responses were subject to the individual's perceptions and recollections. Finally, the data were from a survey given in the spring of 2011, which provided only a snapshot in time rather than longitudinal data.

This study had the following delimitations: The data used were from a survey that was given only to faculty members identified by each of the 15 community colleges in Iowa as being full-time faculty. The data were only from those who chose to respond to the survey, and finally, the variables to assess job satisfaction were limited to those included in the survey instrument.

Definitions of Terms

The following are definitions of some terms used in this study:

Arts and science faculty: faculty who stated that the majority of their teaching assignment was in fine arts, communications, humanities, business, social sciences, physical or natural sciences, mathematics or engineering.

Community college: A public institution granting associate degrees according to the 2000 Carnegie classifications.

Career and technical faculty: faculty who stated that the majority of their teaching assignment was in agriculture, business and information technology, family and consumer science, health occupations, industrial technology, or marketing.

Full-time faculty: Individuals at a community college who are classified as full-time faculty by their institution and taught at least a 1-credit course during the fall term 2010.

Hygiene: In the dual-factor theory model of job satisfaction developed by Herzberg et al. (1959), a factor that leads to dissatisfaction in a job.

Job satisfaction: a faculty member's perspective on a variety of factors that includes specific activities of his/her job, working conditions of the job, rewards and accomplishments received, and support at the job. Those recognized for providing models of job satisfaction have claimed that "job satisfaction" is difficult to define (Herzberg et al., 1957) and that there is no single model to "completely and accurately portray" the construct (Hagedorn, 2000).

Mediator: "a variable or situation that influences (moderates) the relationships between other variables or situations producing an interaction effect" according to Hagedorn's (2000, p. 6) job satisfaction model, a modification and expansion of Herzberg et al.'s (1959) model.

Motivator: factors that lead to satisfaction in a job, according to the job satisfaction model developed by Herzberg et al. (1959).

Non-SEM faculty: Faculty who stated that the majority of their teaching assignment was in the arts and science but not in science, engineering, or mathematics.

SEM: Science, engineering and mathematics

SEM faculty: Faculty who stated that the majority of their teaching assignment was in science, engineering or mathematics.

Trigger: “a significant life event that may be either related or unrelated to the job,” according to Hagedorn’s (2000, p. 6) job satisfaction model, a modification and expansion of Herzberg et al.’s (1959) model.

CHAPTER 2. LITERATURE REVIEW

Role of Community Colleges in the U.S. Higher Education System

Community colleges are educating a large number of students; consequently their enrollments are growing. Diane Jones (2009), former assistant secretary for postsecondary education at the U.S. Department of Education, referred to community colleges as the “workhorses of American Higher Education,” educating advanced high school students, adults needing or wanting to make career changes, first- or second-year college students starting their baccalaureate degree work, students at other 4-year institutions who are interested in taking some of their coursework at a community college, or retirees and octogenarians who are interested in furthering their own learning. In 2003–2004, community colleges enrolled 7.6 million credit-bearing students, enrolling about 40% of all undergraduate students (Townsend & Twombly, 2007). In the fall of 2008, 44% of all undergraduates in the United States were enrolled in community colleges, and between Fall 2008 and Fall 2010, enrollment at community colleges increased by one million students (AACC, 2011). In tight economic times, this increase in enrollment is not surprising given that community colleges provide a more affordable option; for 2010–2011 the average annual tuition and fees for community colleges (public, in district) was \$2,713, whereas for 4-year colleges (public, in-state) it was \$7,605 (AACC, 2011).

Community colleges help an increasing number of students who have graduated from high school but are not yet ready or prepared for college coursework and need to take remedial or developmental courses. According to a 2006 study, about 58% of the students attending a community college had to take at least one remedial course, 44% took between

one and three remedial courses, and 14% took more than three (Attewell, Lavin, Thurston, & Levey, 2006).

Workforce training and education are yet another education endeavor that community colleges provide. As demands in the workplace are changing with more education required, community colleges are often able to help provide the needed training. Also as employees are laid off they are able to further their education at community colleges, where both developmental and undergraduate level courses are taught.

Lack of Study and Research on Community College Faculty

Study of and research about community college faculty is limited. One reason for the scarcity of research is that, in general, researchers often choose topics with which they are familiar, and the majority of research in higher education is done by those at 4-year institutions (Twombly & Townsend, 2008). Some books have been written about community college faculty; however, the titles clearly illustrate the little attention they have received: *Community College Faculty: Overlooked and Undervalued*, by Townsend and Twombly (2007) and *Honored but Invisible: An Inside Look at Teaching in Community College*, by Grubb and Associates (1999). In addition to the lack of research about community college faculty, there is also a problem with much of the research on community college faculty that has been conducted; namely that it was mostly completed through the lens of noncommunity college faculty. In *Community College Faculty: Overlooked and Undervalued*, Townsend and Twombly wrote “Community college faculty are ignored in literature about faculty, and at worst, the literature perpetuates negative stereotypes about them” (p. 3). Additionally, in *Honored but Invisible: An Inside Look at Teaching in Community Colleges*, Grubb and Associates stated that “researchers at 4-year institutions often view community colleges as

second class institutions, barely part of the higher education system, not much more than extensions of high school” (p. 2). Furthermore, in a book review of *A Profile of the Community College Professorate, 1975–2000* (Outcalt 2002a), the reviewer stated that “since 1975 there have been just 3 major published studies that have tried to establish a sound basis for generalizations about community college faculty” (Pedersen, 2003, p. 15).

Qualifications and Hiring Practices for Community College Faculty

Faculty teaching transfer-level courses at a community college must have at least a master’s degree, whereas faculty teaching in technical and vocational classes need only to have at most a baccalaureate degree along with some work or experience in the field (Twombly & Townsend, 2008). A master’s degree provides important knowledge in the subject area; however, it does not provide much, if any, pedagogy or training on dealing with the wide range of student interests, abilities, and motivations that are found in community college students. Furthermore, those who have completed their master’s degree may not be familiar with or knowledgeable about community colleges and the variety of services they provide. Several studies have argued that the importance of teaching at a community college is not reflected in the qualifications for hiring where the primary requirement is a master’s degree (Flannigan, Jones, & Moore, 2004; Grubb & Associates, 1999).

Hiring practices have changed some since the mass hirings in the 1960s, but they are still lacking in identifying the key characteristics of a good faculty member (Flannigan et al., 2004). Furthermore, they are often a hodgepodge cobbled together from hiring practices in industry and other sectors, which according to Flannigan et al. (2004), “do not effectively address or meet the needs of the community college system” (p. 826). The changes that have occurred are mostly a result of the pressure of affirmative action (Grubb & Associates, 1999).

There has been minimal research on hiring practices to help determine best practices in the hiring process. The concerns raised by the anticipated “mass retirement” of faculty members necessitate the need for improved definitions of qualifications to teach at a community college, more consistent and thorough hiring practices to help evaluate the attributes that a good faculty member should possess, and whether or not he/she will be a good fit for a community college with the diverse group that it serves.

Support and Training of Community College Faculty

Community colleges are often identified or referred to as “teaching colleges” because the majority of a faculty’s time is spent on teaching rather than research. However, there are concerns about whether or not they provide a quality education to their students, because the qualifications to teach do not require any training in teaching, and the training and support is often lacking or not well organized. As Grubb & Associates (1999) wrote, “the evidence that community colleges are teaching-oriented is simply missing” (p. 9). They later concluded that “most colleges have used in-service education in unfocused and thoughtless ways” (p. 297).

Due to these concerns, community colleges are heeding some of the criticism and further developing and strengthening their professional development practices (Grant & Keim, 2002). One difficulty in defining what is meant by faculty professional development is that “there are as many definitions as definers” (Wallin, 2003, p. 318), but there is an effort to further clarify and define professional development. The Professional and Organizational Development Network characterizes faculty development as having three components that focus on teaching, scholarly development, and personal skills (Wallin, 2003, p. 318). John Murray, a noted expert in the field as cited by Townsend and Twombly (2007), identified the

following components that professional faculty development programs should have: institutional support with a climate that encourages faculty development; a formal, goal-directed program; links between development and rewards; faculty ownership; support from colleagues for investments in teaching; and a belief on the part of instructors that administrators support and value good teaching. Grant and Keim (2002) summarized the situation best, stating that “if community colleges are to recruit and retain quality faculty, a formal, comprehensive development program to orient, enculturate, renew, and develop all faculty is crucial to the success of institutional missions and individual faculty goals” (p. 805).

What and How Community College Faculty Teach

One of the criticisms leveled at community colleges is that they are often referred to as “teaching colleges” because faculty are focused primarily on teaching; however, there is not evidence that the quality of teaching at a community college is necessarily higher than at other higher education institutions, nor is there evidence of support at the community college of improving teaching. As Grubb and Associates (1999) wrote,

Community colleges are not set up to encourage collegiality around teaching, and so teaching is often an isolated and idiosyncratic activity. . . . [Community college instructors] lack the time, the reasons, and the colleagues that would facilitate such discussions, they are all too often in institutions that simply ignore this dimension of their lives. (p. 27)

Determining the criteria of quality instruction and instructors is a challenge, but from the observations from their study, Grubb and Associates concluded that “the best teaching involves some kind of cooperative activity, with students, with colleagues, and these formats

require widespread cooperation, like linked classes, learning communities, and the institutional practices . . . with administrators as well” (p. 361). To better evaluate the quality of teaching at community colleges and to help find ways to improve them, researchers need to start by identifying what is currently happening in the classrooms and look at how instructors are teaching.

Another aspect of teaching to investigate is the use of technology. Technology has changed many professions, including community college teaching. In particular, the use of technology has provided a vehicle for community colleges to reach more students through online courses, a way to provide more information and access for students, and a way to shift how some courses are taught, moving from the traditional lecture-based classroom to a more decentralized student-centered, inquiry-based classroom. This incorporation of technology into teaching and the new roles that a faculty member assumes as “instructional designer, coach or facilitator, classroom instructional researcher, interdisciplinary team member, and broker of educational experiences . . . [have] a complicated effect on the workload of faculty” (Levin, Kater, & Wagoner, 2006, p. 72). It poses an interesting paradox of making some tasks more efficient and less time consuming while creating more work than was previously expected, such as having to check, manage, and respond to e-mail, in order to provide more instant feedback to students. Levin et al. (2006) went on to say that “in order to understand how much faculty work life is changing, estimates of the extent to which faculty are using instructional technology are needed” (p. 73).

How Faculty View Themselves and How They are Viewed by Others

Research on the role and identity of community college faculty and, in particular, whether or not they are a “unified and distinct professional identity,” has been conducted

(Cohen & Brawer, 1972, 1977; Outcalt, 2002a). In the study by Outcalt (2002a), he concluded that, when looking at the professional practices and attitudes of community college faculty, “there are no simple answers” (p. 151). He asserted that the community college faculty has become increasingly fragmented and diverse. To further explore this topic, he suggested examining the issue within smaller subgroups.

One of the factors involved in how community college faculty view themselves is the expectations the institution has of the faculty. Specifically, are faculty expected to make scholarly contribution, and if so, how are these scholarly contributions defined? Palmer, in his study published in 1992 (cited in Marshood, 1995), defined scholarly products as conference papers, instructional materials, research or technical reports, community information materials, exhibits or performances in the fine arts, technical innovations, and other products. Several years later, Ernest Boyer (1990), in a report *Scholarship Reconsidered: Priorities of the Professoriate*, proposed a broader definition of scholarship that includes teaching as scholarship. Prager (2003) argued that scholarship activity at a community college is difficult in part because

community colleges have not institutionalized scholarship in any form—not in terms of mission, not in terms of policies, not in terms of non-discretionary budgeting, not in terms of workload, not in terms of reward systems, and not in terms of other ways that four-year schools give it substance and life. (p. 580)

Importance of STEM Fields

The United States has been considered a world leader in STEM fields, but there is concern that the nation will not be able to continue as a leader without generating more interest in the STEM fields (Barnett & San Felice, 2006; Members, 2010). The lack of

skilled workers in these fields creates concerns because currently this shortfall is covered by skilled workers on H-1B Visas (George et al., 2001). Additionally, for U.S. citizens to be competitive in the global economy, all students must be well prepared in science and mathematics (Members, 2010; National Science Board, 2006).

Project Kaleidoscope is an organization dedicated to encouraging leaders to build communities that support and enhance education in STEM fields. Project Kaleidoscope has developed the following goals for Project Kaleidoscope in Two-Year Colleges: “Empower two-year college faculty as leaders in STEM education, scholarship and research. Ensure seamless STEM education pre-K–16 and beyond. Create meaningful learning experiences in science for students at all levels consistent with how people learn” (Kincaid et al., 2006).

Job Satisfaction of Community College Faculty

As concern over mass retirements of faculty and the diminishing pool of qualified faculty members increases, factors that affect job satisfaction must be considered, which in turn, may affect a faculty member’s intent to stay at an institution. Rosser and Townsend (2006) wrote that “what is missing in research on community college faculty’s job satisfaction and intent to leave are efforts to understand how demographic variables, professional and institutional work life issues, and job satisfaction simultaneously interact to explain faculty intentions to leave” (p. 128).

Job satisfaction is difficult to define and even more challenging to model. Hagedorn (2000) stated, “There is general agreement that the concept of job satisfaction is complex and convoluted. In truth, no single conceptual model can completely and accurately portray the construct” (p. 5). There are three primary models or theories of job satisfaction identified in literature: content theories, process theories, and situational theories (Thompson, McNamara,

& Hoyle, 1997). Content theories explain job satisfaction in terms of various needs to be met that then contribute to job satisfaction. Two examples of this type of model are Maslow's (1943) need hierarchy theory and Herzberg et al.'s (1959) motivator–hygiene theory. Process theories explain job satisfaction in terms of the difference between employee expectations from their work and what they actually receive from work in regards to various values and needs. Two examples of process models are Vroom's (1964) expectancy theory and Adam's (1993) equity theory. Situational theories explain job satisfaction in terms of variables that affect their work, variables in their workplace, and various situations that employees are at in their lives. One example of this theory is Glisson and Durick's (1988) predictors of job satisfaction.

All of these models identify different variables that impact job satisfaction. Milosheff (1990) identified five broad categories of variables that have been studied in job satisfaction: (a) personal and demographic characteristics (such as gender, race, age), (b) professional activities/responsibilities (such as time spent on various aspects of the job—teaching, grading, serving on committees), (c) perception of and relationships with students (such as faculty views on student preparation, interactions with students outside of class), (d) institutional environment (such as faculty salaries, professional development opportunities), and (e) departmental environment (such as faculty perception of department meetings and reputation, relationships with colleagues). These variables play different roles in the various models of job satisfaction. Herzberg et al. (1959) identified factors that contribute to job satisfaction (achievement, recognition, work itself, responsibilities, and advancement) and different factors contributing to job dissatisfaction (policy and administration, supervision, salary, interpersonal relations and working conditions). Hagedorn's (2000) model identifies

two constructs that interact and affect job satisfaction. The first construct, called triggers, consists of six unique significant life events (change in life stage, change in family-related or personal circumstances, change in rank or tenure, transfer to a new institution, change in perceived justice, and change in mood or emotional state). The second construct, called mediators, consists of three variables that can interact with each other affecting job satisfaction (motivations and hygienes, demographics and environmental conditions).

Summary

Community colleges serve an important role in the educational system in the United States. They currently educate nearly half of all undergraduates, and this is likely to continue to increase, especially during difficult economic times, because they offer a more affordable option than do 4-year colleges. In addition to educating undergraduates, community colleges help high school students to prepare for continuing their postsecondary education and/or to receive important training to enter the workforce. Community colleges provide advanced academic course offerings for students interested in getting a bachelor's degree along with career and technical offerings for students interested in obtaining certification and then entering the workforce. Community colleges also provide remedial education for students needing to further their education.

The variety of educational services provided by community colleges can be challenging for faculty. Historically, community college faculty entered with high school teaching experiences, but that is changing. Faculty teaching in the arts and science disciplines are typically required to have a master's degree, whereas faculty teaching in the career and technical area are not required to have a master's degree. Support and training for the increasing demands on community college faculty are important to help ensure that

quality faculty are both attracted and retained at community colleges. Because up to three-fourths of the current full-time faculty are reaching retirement age, this is especially concerning. Understanding the current faculty and examining factors that contribute to faculty job satisfaction could help in retaining faculty.

Job satisfaction is a complex concept, but as Johnson (2009) wrote,

With less flexibility in salary and benefits, higher education decision makers must be creative in developing appealing workplaces in order to recruit and retain quality faculty. . . . In this environment, understanding the factors that lead to faculty job satisfaction is crucial. (pp. 3–4)

CHAPTER 3. DATA COLLECTION AND METHODOLOGY

Overview

The purpose of this study was to further understand the characteristics, background, needs and job satisfaction of full-time community college faculty. More specifically, the goals of this study were to examine the characteristics of full-time SEM faculty, their background and experiences, and their job satisfaction using data collected from a survey given to faculty at all 15 community colleges in Iowa in the spring of 2011.

The survey instrument was developed with input from a team of graduate students in the Educational Leadership and Policy Studies (ELPS) program at Iowa State University (ISU) and interested ELPS faculty members. Several national faculty surveys were examined for potential questions, which were then modified and compiled along with other additional questions that were developed. Qualtrics survey software was used to develop and administer the survey. The Office of Community College Research and Policy (OCCRP) at ISU provided support and training on the software and kept the data collected from the survey on a secure server in OCCRP. Several other graduate students planned to use data collected from the survey for study, and the participating community colleges will receive a report on the survey results from the OCCRP.

The following research questions guided this study:

1. What are the demographic characteristics of community college full-time science, engineering and mathematics (SEM) faculty? Are there differences in gender, age, and race between SEM faculty and other arts and science (non-SEM) faculty? Are there differences in gender, age, and race between arts and science faculty and career and technology faculty?

2. What are the background qualifications and previous experiences of community college full-time SEM faculty? In particular, are there differences in degrees attained between SEM and non-SEM faculty? Are there differences in experiences in both secondary and postsecondary teaching between SEM and non-SEM faculty? Or between arts and science faculty and career and technology faculty?
3. Are there differences in overall job satisfaction of community college full-time SEM and non-SEM faculty? Or between arts and science faculty and career and technology faculty?
4. What factors contribute to community college full-time faculty's job satisfaction? Is there a difference in how well the model predicts job satisfaction for arts and science faculty compared to career and technology faculty? Does the model predict job satisfaction for SEM faculty better than for other arts and science faculty?

Research Survey and Sample Design

The purpose of this study was to obtain a better understanding of current Iowa community college full-time SEM faculty. More specifically, this study examined faculty demographics, their qualifications and teaching background, and their job satisfaction. A survey instrument was developed to collect data from community college full-time faculty in Iowa to answer the research questions in this study as well as questions that other graduate students were investigating. The survey was constructed from modified questions used in the following national surveys: the Higher Education Research Institute Faculty Survey, National

Study of Postsecondary Faculty, and the Community College Faculty Survey of Student Engagement, along with other questions developed by the team.

The Higher Education Research Institute Faculty Survey faculty survey was first administered in 1989 to 33,785 full-time faculty at 378 institutions (2-year colleges, 4-year colleges, and universities (Sax, Astin, Korn, & Gilmartin, 1999). The survey, given for a fee every 3 years at interested institutions, originated as a pencil and paper survey, but has been delivered as a web-based survey since 2007. The survey has questions on the following areas: demographics, background characteristics, faculty attitudes and experiences in their profession, faculty perceptions of student preparedness, faculty teaching practices, professional activities, and workload and job satisfaction. In addition to the prepared questions, participating institutions also can include some locally developed questions. Participating institutions receive a detailed report on their faculty and national normative data for similar types of institutions (Lindholm, Szelenyi, Hurtado, & Korn, 2005).

The National Survey of Postsecondary Faculty was first administered in 1987–1988 to a sample of 480 institutions, including 2-year, 4-year, doctorate-granting, and other colleges and universities (National Center for Education Statistics, n.d.). The survey addresses the following topics: sociodemographic characteristics, academic and professional background; field of instruction; employment history, current employment status including rank and tenure; workload, courses taught; publications, job satisfaction and attitudes; career and retirement plans; and benefits and compensation.

The Community College Faculty Survey of Student Engagement is a companion survey for institutions administering the Community College Survey of Student Engagement to their students. These surveys, given annually to interested institutions for a fee, were

developed in 2001 as a project for the Community College Leadership Program at the University of Texas, Austin. The student and faculty surveys were developed in response to requests from community colleges for a survey comparable to the National Survey of Student Engagement and the National Faculty Survey of Student Engagement , which are given to students and faculty at 4-year institutions. They were initially developed in 1998 in response to “concerns about the quality of undergraduate education and the lack of emphasis on student learning in the major college rankings” (Center for Community College Student Engagement, n.d.). The Community College Faculty Survey of Student Engagement and the National Faculty Survey of Student Engagement have many common items, but also some differences. The Community College Faculty Survey of Student Engagement has questions on the following areas: faculty perceptions of students’ educational experiences, the nature and frequency of faculty–student interactions, their teaching practices, and other professional activities both inside and outside of the classroom. Participating institutions receive a report on both their student responses and their faculty responses.

Our survey development team analyzed and discussed our survey multiple times to determine whether or not the questions were worded clearly using terminology commonly understood by community college faculty. The order and content of the questions were also analyzed and discussed to ensure that the various topics of interest on which the team wanted to collect data were adequately addressed. Next, the survey was reviewed by three experts, Mr. Joseph C. DeHart, Executive Director of Institutional Effectiveness/Assistant to the President, Des Moines Area Community College; Dr. Linda Serra Hagedorn, College of Human Sciences Associate Dean for Undergraduate Programs, ISU; and Dr. Michael Morrison, former president of North Iowa Area Community College. After receiving their

comments, the team made a number of modifications to the survey. The number of questions and the length of time to answer all the survey questions were major concerns. In an effort to ensure that the survey was not too long, which the team felt would greatly reduce the number and quality of responses, a number of survey questions were omitted or refined.

Members of the team completed the survey to pretest the Qualtrics software and obtain an estimation of the time it would take participants to answer the survey questions. For her capstone project, Jane Bradley, a graduate student in the ELPS program, piloted the survey with a select group of retired faculty members and faculty not currently teaching at a community college in Iowa. After the pilot participants took the survey, they responded to questions about the survey; in particular, the length of time it took them to answer the questions, whether or not there were any unclear instructions or questions, and whether or not the response choices were clear. The results from the pilot were used to make further revisions.

In anticipation of administering this survey, an application was submitted to and approved by the ISU Institutional Review Board (IRB; Appendix A). The team members who worked on developing the survey completed the National Institutes of Health Human Protection Training and have their certificates of completion. Approval for administering this survey to community college faculty in Iowa was obtained from each community college president on official letterhead. Faculty who chose to participate gave their informed consent by completing the survey and submitting their responses. Their participation was completely voluntary, and the survey questions were not considered sensitive in nature. At any point in the survey, participants could skip a question by leaving it blank or exit the survey. The data that were submitted were stored electronically, password protected, on a server at ISU within

the OCCRP; furthermore, access was limited to the team members approved on the IRB form. College level results from the survey will be shared as a summary report; however, results (disaggregated cells) containing fewer than 10 cases will be suppressed to protect any indirect identification of the participants.

Population and Sample

The population for this study included all full-time faculty teaching at a community college in the spring of 2011. The president of each community college in Iowa signed a letter granting permission for the survey to be e-mailed to full-time faculty at their institution. A local contact person for each college was designated to provide e-mail addresses of full-time faculty, or to e-mail the survey link to their full-time faculty members. The 15 community colleges in Iowa identified 1,812 full-time faculty members to be included in the population. Of the 1,812 e-mails sent with the survey link, two people responded that they were not faculty, so they were excluded from the sample.

Instrumentation

The survey developed consists of questions in sections grouped by the following topics: employment and education, responsibilities and workload, teaching and learning, professional development, student relations, partnerships, job choice and satisfaction, demographics and comments. These sections were chosen to address the team members' various research questions. The five guiding principles given by Fowler (2009) in the 4th edition of his book, *Survey Research Methods*, were closely followed. As Fowler recommended, the questions were all fairly self-explanatory, and nearly all of the questions were closed questions. The order of the sections was established so that the initial sections contained questions that are relatively easy and not so sensitive to answer, followed by more

in-depth questions about job duties, and then concluding with questions about salary and job satisfaction, which may be more sensitive questions. The number of questions was minimized whenever possible by grouping questions with the same initial wording into a single question with multiple parts. Using the Qualtrics software, the questions were presented in an uncluttered, clear fashion, with frequent page breaks to minimize the need to scroll up and down the screen. The team spent a significant amount of time trying to compose clear, concise questions.

The employment and education section had eight questions. The questions, nearly all closed questions, inquired about the status of the faculty member (full time, part time), their principal activity in their position, in what academic discipline their primary responsibilities were, whether or not they belonged to a union, the degrees they had earned, their years of teaching experience at various institutions, the number of years they had been at their current institution, and whether or not they attended a community college before becoming a faculty member.

The responsibilities and workload section had three questions. The first two questions were open-ended questions about the number of credit hours taught at the current institution this past academic year and the number of credit hours taught at other institutions this past academic year. The last question had multiple parts asking about the average number of hours faculty spent in a typical week on a variety of tasks. The question was a closed question with an interval scale of choices: 0, 1–4, 5–8, 9–12, 13–16, 17–20, 21 or more.

The teaching and learning section had five closed questions. The questions asked about how frequently various instruction techniques were used; what types of evaluation

were used; which types of technology were used in teaching; what methods of communication were used with students; and how many courses were taught using different methods of delivery, whether online, hybrid, or interactive television (the Iowa Communication Network —ICN).

The professional development section had four closed questions. Two questions asked whether or not faculty had participated in various professional development activities (such as workshops on and off campus, classes on and off campus, conferences, and other professional development opportunities), and for each activity that faculty participated in, they also were asked to evaluate the usefulness of that activity on a four-point scale. The other questions asked whether or not faculty were pursuing a higher degree or were interested in doing so and whether or not they had done any research at their institution.

The student relations section had five closed questions with multiple parts. The first three questions asked about levels of agreement on a five-point scale, with “don’t know” as a sixth option. The first question asked about student preparedness and resources available to them, the second question asked about faculty interactions with students, and the third question asked about student involvement in academic and social groups. The last two questions in the section asked about faculty interactions with students and faculty involvement in activities within their discipline.

The partnership section had one question with multiple parts about how frequently faculty had collaborated with others outside of their institutions, such as other community college faculty, faculty from other institutions of higher education, teachers in high schools, and employees of area businesses.

The job choice and satisfaction section had eight closed questions with multiple parts. The first question asked faculty to rate, on a four-point scale, the importance of various factors in their decision to take their job and, secondly, to rate those factors in their decision to stay in their job. The next three questions asked in multiple part questions about levels of agreement about their fit in their department, how well courses transferred from their department, and the climate at their institution. The last four questions asked about satisfaction with various aspects of their employment (e.g., salary, benefits, office space, etc.), their future plans, types of training that would be helpful, and factors that would help their work/life balance.

The demographics section had six closed questions and one open-ended question. The closed questions ask about gender, age, race, marital status, base salary range, and range of additional compensation received for extra duties, such as teaching summer school classes or overloads. The one open-ended question asks about the number of months on which their base salary is based.

The final section had the following five open-ended questions: (a) What do you enjoy the most about your job as a community college faculty member? (b) What do you enjoy the least about your job as a community college faculty member? (c) What would improve your job as a community college faculty member? (d) What advice do you have for future community college faculty members? (e) Please describe important characteristics or qualities of an effective community college instructor.

Data Collection Procedures

Data were collected in the spring of 2011 using the survey developed for all full-time community college faculty in Iowa. The survey instructions and questions were entered

using Qualtrics software. On April 14, 2011, using the Qualtrics software, a web link to the survey was e-mailed to all full-time community college faculty members at 13 of the 15 community colleges; these e-mail addresses were obtained from each community college. The other two community colleges identified a contact person who received the e-mail, and then they e-mailed it to all full-time faculty at their college. The initial e-mail contained the web link to the survey (Appendix B) and a cover letter (see Appendix C) from the principal investigator explaining the purpose of the survey and inviting full-time faculty to participate, instructions on how to access the survey, and contact information for the principal investigator and ISU supervising faculty members Larry Ebbers and Frankie Santos Laanan.

Participants' consent was obtained by their choice to answer the questions on the survey. At any point in the survey, participants could skip a question or exit the survey. They could also save their responses and come back at a later time to complete the survey and submit it. The OCCRP at ISU maintained the responses, and only team members approved in the IRB application had access to the data to maintain the security of the data.

A presurvey e-mail was sent to all 15 community colleges in Iowa on April 13, 2011, to alert them to watch for the e-mail containing the link and information about the survey. On April 14, 2011, the e-mail containing the web link to the survey was sent to all 15 community colleges. To help facilitate a high response rate, six reminder e-mails were sent to nonrespondents over the next 4 weeks. The contact dates were: April 13, 2011, presurvey e-mail; April 14, 2011, survey link and cover letter e-mail; April 19, 2011, e-mail reminder 1; April 26, 2011, e-mail reminder 2; May 1, 2011, e-mail reminder 3; May 5, 2011, e-mail reminder 4; May 9, 2011, e-mail reminder 5; and May 10, 2011, final e-mail reminder.

Surveys were completed from April 14, 2011, through May 15, 2011. Survey data were then exported from the Qualtrics survey to *Software to Statistical Package for Social Sciences* (SPSS) software and stored on a secure server. There were with links sent to the 1,810 full-time faculty, and of these, 958 surveys were completed and returned, for a response rate of 52.9%.

Data Analysis

The statistical package SPSS for Windows was used for most of the statistical analysis for this study. Descriptive statistics were conducted to address parts of all the research questions. Chi-square hypothesis tests and independent sample *t* tests were conducted to investigate differences for research questions 1, 2 and 3. Exploratory factory analysis (EFA) and multiple regressions were conducted to answer research question 4.

Descriptive Statistics

Using SPSS and Excel software, demographic and background characteristics were analyzed by computing descriptive statistics and frequency tables. Numerical summaries, frequencies, and percentages were computed for gender, age, race, years of experience at current institution, years of experience teaching at the secondary and postsecondary levels, certification to teach at secondary levels, and degrees obtained. To check assumptions for the various hypotheses, tests were conducted and descriptive statistics were analyzed.

Chi-Square Tests

Chi-square tests can be used to examine whether or not there is at least one proportion that is different when comparing two or more proportions from independent samples. To examine whether or not there were differences between disciplines in categorical demographic variables, chi-square tests were conducted.

Independent Sample *T* Tests

Independent sample *t* tests can be used to examine whether or not there is a difference between means when comparing means from two independent samples.

Exploratory Factor Analysis (EFA)

To further investigate factors that contribute to job satisfaction, EFA was performed to determine which of various selected items from the survey could be grouped together as factors. In exploratory factor analysis, variables that are strongly interrelated are grouped together; this helps reduce a larger number of items to a few key items, reduces irrelevant variables, and eliminates redundancy. In EFA a factor loading is computed for each variable. According to Comrey and Lee (1992), factor loadings for variables greater than .70 are considered excellent, over .63 is very good, and .55 is good. The analysis identified 13 factors: (a) student preparation and support, (b) student support services, (c) recruitment and retention of students, (d) encouragement of students, (e) student interactions, (f) collegiality, (g) professional development on different learners, (h) conference presentations, (i) family friendliness, (j) physical environment, (k) benefits, (l) contentment, and (m) future plans. After the factors were identified, a Cronbach's alpha was computed for each factor to measure the reliability of the combined items to measure a single factor. Alpha scores of .60-.70 generally indicate acceptable reliability, and scores of .80 or higher indicate very good reliability.

Multiple Regression Analysis

To examine the relationship between various dependent variables and the independent variable of job satisfaction, multiple regression analysis was conducted. The dependent variables were determined from the EFA. The 13 dependent variables identified were each

formed into single composite variables, and they, along with gender and age, were the 15 independent variables used in the multiple regression analysis.

Summary

The purpose of this study was to examine data collected from a survey of full-time community college faculty in Iowa to obtain a better understanding of SEM faculty. As concerns increase about the challenges and difficulties in attracting and retaining qualified faculty in these areas, community colleges must develop and execute a plan to recruit and retain effective faculty in these high-demand disciplines.

This study focused on examining many aspects of current SEM faculty. In particular, it investigated possible differences between the SEM disciplines in demographics, background, experiences, their perspectives on their job, worklife and their future intentions. The study also examined multiple regression models to predict overall job satisfaction of SEM faculty. Information from this study could help determine future faculty qualification, training, and support to maintain highly qualified faculty in areas facing possible shortages.

CHAPTER 4. RESULTS

This chapter provides details of the results of this study and is organized in five sections, each section addressing one of the research questions. In the first section demographic characteristics of SEM faculty, frequency distributions, and descriptive statistics are reported. Statistical test results compare the demographics of SEM faculty with other arts and science faculty and also compare the demographics of arts and science faculty with career and technical faculty. In the second section is an examination of the backgrounds of SEM faculty, comparing SEM faculty with other arts and science faculty, in addition to comparing arts and science faculty with career and technical faculty. In the third section overall job satisfaction across faculty groups is reported. In the fourth section, first there is a description of how factors were determined from the survey questions and then a discussion of the investigation of how these factors contribute to overall job satisfaction. Exploratory factor analysis on the variable loads and clusters also are included. A report on the multiple regression analysis performed to investigate factors that predict overall job satisfaction comprises the final section.

Demographic Characteristics of Science, Engineering, and Mathematics Faculty

Data used to exam the demographic characteristics was collected from a survey issued to all community college faculty identified as full time by a representative from each of the 15 community colleges in Iowa. As part of the requirements of the IRB at ISU, respondents had the option to not answer questions, so sample sizes differ for some of the variables reported in this study. Furthermore, in order to protect the indirect identification of any individuals, results for characteristics identified by fewer than 10 respondents were suppressed.

Participants were asked to provide demographic information about their gender, age, race, marital status, salary, and union membership. This demographic information is summarized in Table 4.1, broken down by faculty discipline groups: SEM faculty, the other arts and science (non-SEM) faculty, and the career and technical faculty. A summary table

Table 4.1

Demographic Characteristics of Iowa Community College Full-Time Faculty

| Variable | SEM faculty | | | Non-SEM faculty | | | CT faculty | | |
|--|-------------|----------|------|-----------------|----------|------|------------|----------|------|
| | <i>N</i> | <i>n</i> | % | <i>N</i> | <i>n</i> | % | <i>N</i> | <i>n</i> | % |
| Gender | 153 | | | 241 | | | 437 | | |
| Female | | 72 | 47.1 | | 133 | 55.2 | | 223 | 51.0 |
| Male | | 81 | 52.9 | | 108 | 44.8 | | 214 | 49.0 |
| Age | 138 | | | 220 | | | 381 | | |
| <25 years | | a | a | | a | a | | a | a |
| 25–34 years | | 13 | 9.4 | | 24 | 10.9 | | 36 | 9.4 |
| 35–44 years | | 34 | 24.6 | | 40 | 18.2 | | 89 | 23.4 |
| 45–54 years | | 48 | 34.8 | | 70 | 31.8 | | 123 | 32.3 |
| 55–64 years | | 37 | 26.8 | | 71 | 32.3 | | 127 | 33.3 |
| 65–74 years | | a | a | | 15 | 6.8 | | a | a |
| Race/ethnic background | 135 | | | 210 | | | 388 | | |
| American Indian or Alaska Native | | a | a | | a | a | | a | a |
| Asian | | a | a | | a | a | | a | a |
| African American | | a | a | | a | a | | a | a |
| Hispanic | | a | a | | a | a | | a | a |
| Hawaiian or Pacific Islander | | a | a | | a | a | | a | a |
| White | | 127 | 94.1 | | 201 | 95.7 | | 371 | 95.6 |
| Marital status | 137 | | | 215 | | | 384 | | |
| Single and never married | | 17 | 12.4 | | 20 | 9.3 | | 21 | 5.5 |
| Married | | 105 | 76.6 | | 164 | 76.3 | | 304 | 79.2 |
| Living with partner or significant other | | a | a | | a | a | | a | a |
| Separated, divorced or widowed | | 11 | 8.0 | | 23 | 10.7 | | 49 | 12.8 |
| Salary | 138 | | | 214 | | | 382 | | |
| < \$20,000 | | a | a | | a | a | | a | a |
| \$20,000–\$39,999 | | 11 | 8.0 | | 17 | 7.9 | | 35 | 9.2 |
| \$40,000–\$59,999 | | 97 | 70.3 | | 145 | 67.8 | | 204 | 53.4 |
| \$60,000–\$79,999 | | 27 | 19.6 | | 46 | 21.5 | | 121 | 31.7 |
| \$80,000–\$99,999 | | a | a | | a | a | | 21 | 5.5 |
| \$100,000+ | | a | a | | a | a | | a | a |
| Union membership status | 140 | | | 239 | | | 417 | | |
| No | | 60 | 42.9 | | 81 | 33.9 | | 201 | 48.2 |
| Yes | | 80 | 57.1 | | 158 | 66.1 | | 216 | 51.8 |

Note. SEM = Science, engineering, and mathematics; CT = Career and technology.

^aFewer than 10 respondents; values not reported.

showing the demographic characteristics for the sample as a whole may be found in Appendix D.

The majority of the respondents to the survey were female (54.4%, $n = 509$); males represented 45.6% ($n = 382$). There were no significant differences in the proportion of females and males when comparing SEM faculty with non-SEM faculty. When comparing the proportion of males and females across all the arts and science disciplines, there was a statistical difference between the proportions of females in communications and all other arts and science disciplines. Because there were fewer than 10 respondents from engineering, that discipline was not compared with the other arts and science disciplines. The counts and percentages of gender across all the arts and science disciplines are shown in Table 4.2.

There has been growing concern over the lower proportion of women in SEM disciplines, but the data from the survey does not support that at the community college level. This supports observations that females in the SEM disciplines may be more attracted to community colleges rather than 4-year colleges or universities (Jaschik, 2011). According to

Table 4.2

Gender Distribution, by Frequency and Percent, in Arts and Science Disciplines

| Discipline | Female | | Male | | Total |
|-----------------|----------|------|----------|------|----------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> |
| Fine arts | 14 | 42.4 | 19 | 57.6 | 33 |
| Communication | 62 | 68.1 | 29 | 31.9 | 91 |
| Humanities | 12 | 40.0 | 18 | 60.0 | 30 |
| Business | 13 | 52.0 | 12 | 48.0 | 25 |
| Social sciences | 32 | 51.6 | 30 | 48.4 | 62 |
| Science | 37 | 44.6 | 46 | 55.4 | 83 |
| Math | 35 | 51.5 | 33 | 48.5 | 68 |
| Engineering | a | | a | | a |

^aFewer than 10 respondents; values not reported.

the report *Why So Few?: Women in Science Technology, Engineering and Mathematics?*, 40% of full-time faculty in degree-granting colleges and universities in the United States are women; however, in the SEM disciplines, the percentage of women who are full-time faculty is significantly lower, with 18% women faculty in Science, 12% in Engineering and 19% in Mathematics (Hill, Corbett, & Rose, 2010).

In regards to ethnicity, community college full-time faculty in Iowa are highly homogenous; 95.5% of all the full-time faculty members stated that they were White. When race was further broken down according to discipline, there were no significant differences in the proportion of White faculty when compared across all the disciplines, in SEM disciplines compared to non-SEM, and in all arts and science disciplines and all career and technical disciplines. Of the SEM faculty, 94.1% reported that they were White, and 97.1% of the non-SEM faculty reported being White. The lack of diversity in the faculty continues to be a concern for Iowa community colleges, although it is not different from the overall racial population distribution in Iowa, where 91.3% of the population in Iowa is White (U.S. Census Bureau, 2010)(US Census Bureau, 2010).

In investigating the distribution of the ages of the faculty, there is evidence that supports the graying of full-time community college faculty. The mean age of the faculty was 48.95 years ($SD = 10.47$), and the median age was 49.5 years. The distribution of ages of all community college faculty is shown in Table 4.3. Because the distribution of faculty ages was not normal, Kruskal-Wallis tests were conducted to compare the median ages of faculty. There was no significant difference between the median age of SEM faculty when compared to the median age of non-SEM faculty ($p = 0.116$). Furthermore, the median ages of faculty in all the arts and science disciplines were not significantly different from each

Table 4.3

Distribution of Ages of Iowa Community College Faculty

| Age of faculty | <i>n</i> | % |
|----------------|----------|-------|
| < 25 years | a | a |
| 25–34 years | 81 | 9.9 |
| 35–44 years | 184 | 22.5 |
| 45–54 years | 268 | 32.7 |
| 55–64 years | 256 | 31.3 |
| 65 – 74 years | 27 | 3.3 |
| Total | 819 | 100.0 |

^aFewer than 10 respondents; values not reported.

other ($p = 0.125$), nor were the median ages of faculty in all the career and technical disciplines ($p = 0.263$).

Using a definition of career stages similar to Hagedorn's (2000) definition of career stages (early career stage, younger than 35 years; middle career stage, 35–54 years; and late career stage, 55 years and older), results indicate that only 9.9% of all faculty were in the early career stage, 55.2% were in the middle career stage, and 34.6% were in the late career stage (Hagedorn, 2000). Again, there is evidence of an aging faculty population, as there is a very high percentage of faculty in the middle and late career stages. The distribution of faculty in the career stages across the discipline groups is shown in Table 4.4.

Table 4.4

Distribution of Faculty in Career Stages by Discipline Groups

| Career stage | SEM faculty | | Non-SEM faculty | | CT faculty | |
|------------------------------------|-------------|------|-----------------|------|------------|------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Early career (35 years or younger) | 14 | 10.1 | 24 | 10.9 | 30 | 9.3 |
| Middle career (35–54 years) | 82 | 59.4 | 110 | 50.0 | 180 | 55.7 |
| Late career (55 years or older) | 42 | 30.4 | 86 | 39.1 | 113 | 35.0 |
| Total | 138 | | 220 | | 323 | |

Note. SEM = Science, engineering, and mathematics; CT = Career and technology.

Since 1994 there has been no mandatory retirement at age 70, so the graying of faculty may not necessarily imply a high percentage of retirements in the near future. To further investigate whether or not faculty are likely to be retiring soon or leaving their job, responses to questions about faculty plans in the next three years were examined. The questions asked faculty whether they had thought about leaving their current job, whether they plan to look for a job outside of the institution within the next three years, whether they plan to look for a job outside of academia within the next three years, and finally whether they plan to retire within three years. The responses to these questions are summarized in Table 4.5 by faculty discipline groups. Although many full-time faculty had thought about leaving their jobs, (45.7%, $N = 827$), only 17.5% of them were planning to retire in the next 3 years. Some planned to look for a job outside of their institution (20.2%, $N = 822$), and some planned to look for a job outside of academia (12.7%, $N = 821$) in the next 3 years.

There were no significant differences in family stages across the disciplines when comparing SEM faculty with non-SEM faculty or when comparing arts and science faculty within their disciplines. Of the 815 faculty who responded to the survey question on marital status, 78.6% reported that they are married; 11.4% were separated, divorced or widowed;

Table 4.5

Future Plans by Faculty Groups

| Survey question | SEM faculty | | | Non-SEM faculty | | | CT faculty | | |
|---|-------------|-----|------|-----------------|-----|------|------------|-----|------|
| | <i>N</i> | Yes | % | <i>N</i> | Yes | % | <i>N</i> | Yes | % |
| Thought about leaving the job | 141 | 53 | 37.6 | 216 | 99 | 45.8 | 389 | 190 | 45.8 |
| Plan to look for a job outside of the institution in the next 3 years | 139 | 25 | 18.0 | 215 | 36 | 16.7 | 387 | 87 | 22.5 |
| Plan to look for a job outside of academia in the next 3 years | 140 | 12 | 8.6 | 215 | 18 | 8.4 | 386 | 65 | 16.8 |
| Plan to retire in the next 3 years | 141 | 19 | 13.5 | 217 | 38 | 17.5 | 388 | 77 | 19.8 |

Note. SEM = Science, engineering, and mathematics; CT = Career and technology.

7.6% were single and had never been married; and 2.8% were living with a partner or significant other.

Of the 15 community colleges in Iowa, 2 did not have a union; consequently analysis of union membership might make it to appear lower than at higher education institutions in other parts of the United States. The majority of community college faculty in Iowa belonged to a union (57.1%, $N = 888$). There was no significant difference between the percentage of SEM faculty who belonged to a union compared to the percentage of non-SEM faculty who belonged to a union. Somewhat surprising is the fact that the percentage of arts and science faculty belonging to a union (62.5%) was significantly higher than that of career and technical faculty (51.8%).

Background Characteristics of Science, Engineering, and Mathematics Faculty

In the survey, full-time faculty were asked to identify all their academic degrees; the frequencies and percentages are summarized in Table 4.6 by discipline groups. Because survey respondents could have multiple degrees, the counts do not necessarily represent exclusive counts. There were no significant differences when comparing the distribution of degrees between SEM faculty and non-SEM faculty. However, there were significant differences when comparing the distributions of degrees between arts and science faculty with career and technical faculty. This is not surprising given that the degree requirements differ between these two faculty groups. The Iowa Department of Education (2011) requires community college faculty teaching college transfer courses to have a master's degree in the subject area they are teaching or to have 12 graduate hours in the subject area they are teaching along with a master's degree in another field. Career and technical community college faculty are required to have a baccalaureate or graduate degree in their field or

Table 4.6

Degrees Held by Full-Time Community College Faculty by Discipline Group

| Degree | SEM faculty | | Non-SEM faculty | | Career & technical faculty | | Total | |
|--------------|-------------|------|-----------------|------|----------------------------|------|----------|------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Doctorate | 38 | 16.8 | 49 | 13.0 | 10 | 1.8 | 97 | 8.4 |
| Professional | a | a | 11 | 2.9 | a | a | 21 | 1.8 |
| Master's | 117 | 51.8 | 209 | 55.6 | 164 | 29.7 | 490 | 42.5 |
| Bachelor's | 54 | 23.9 | 80 | 21.3 | 175 | 31.7 | 309 | 26.8 |
| Associate's | 13 | 5.8 | 23 | 6.1 | 132 | 23.9 | 168 | 14.6 |
| Certificate | a | a | a | a | 53 | 9.6 | 59 | 5.1 |
| None | a | a | a | a | 10 | 1.8 | 10 | 0.9 |
| Total | 226 | | 376 | | 552 | | 1,154 | |

Note. SEM = Science, engineering, and mathematics.

^aFewer than 10 respondents; values not reported.

specialized training and at least 6,000 hours of recent and relevant work experience in their field.

Historically many community college faculty taught in secondary schools before teaching at a community college. Over time, this pathway has diminished, and fewer faculty have certification to teach or experience teaching at the secondary level. The counts and percentages of faculty who are certified to teach at secondary and postsecondary levels are shown in Table 4.7. Again, faculty could select multiple areas in which they were qualified to teach. Chi-square tests showed there was no statistically significant difference between the distribution of certification among SEM and non-SEM faculty ($p = 0.277$), but there was a statistically significant difference in the distribution of certification levels between arts and science faculty and career and technical faculty ($p < .000$).

Table 4.7

Teaching Experience of Full-Time Community College Faculty by Discipline Group

| Certification level | SEM faculty | | Non-SEM faculty | | CT faculty | | Total | |
|---------------------|-------------|------|-----------------|------|------------|------|----------|------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Elementary | 7 | 3.6 | 15 | 5.3 | 9 | 3.2 | 32 | 4.3 |
| Middle school | 38 | 19.8 | 46 | 16.3 | 26 | 9.4 | 110 | 14.6 |
| High school | 59 | 30.7 | 73 | 25.8 | 61 | 22.0 | 193 | 25.7 |
| Community college | 76 | 39.6 | 119 | 42.0 | 170 | 61.4 | 365 | 48.5 |
| 4-year college | 12 | 6.3 | 30 | 10.6 | 11 | 4.0 | 53 | 7.0 |
| Total | 192 | | 283 | | 277 | | 752 | |

Note. SEM = Science, engineering, and mathematics; CT = Career and technology.

In examining years of experience teaching at secondary and postsecondary levels, there were significant differences between the arts and science faculty and the career and technical faculty in the average number of years teaching at all levels. At every level, the arts and science faculty had a significantly higher mean of years of experience than did the career and technical faculty. The number of respondents, means, standard deviations, and *p* values from independent *t* tests are listed in Table 4.8. In comparing the years of experience at each level between SEM faculty and non-SEM faculty, there was a significant difference only at the high school level, where the SEM faculty had a mean of 4.601 years of experience and the non-SEM faculty had a mean of 2.791 years ($p = 0.024$).

Table 4.8

Community College Faculty Years of Experience Teaching

| Teaching level | Arts & science faculty | | | Career & technical faculty | | | <i>p</i> value |
|-------------------|------------------------|----------|-----------|----------------------------|----------|-----------|----------------|
| | <i>n</i> | <i>M</i> | <i>SD</i> | <i>n</i> | <i>M</i> | <i>SD</i> | |
| Elementary | 223 | 0.361 | 1.334 | 224 | 0.131 | 0.946 | 0.036 |
| Middle school | 250 | 1.204 | 3.110 | 227 | 0.410 | 1.959 | 0.001 |
| High school | 288 | 3.436 | 6.388 | 260 | 2.062 | 5.261 | 0.006 |
| Community college | 413 | 13.093 | 8.885 | 420 | 11.674 | 8.900 | 0.022 |
| 4-year college | 268 | 4.010 | 5.652 | 212 | 1.354 | 3.864 | 0.000 |

The last aspect of background comparison was whether or not faculty had previously attended a community college. There was a significant difference in the percentage of arts and science faculty who had attended a community college compared to career and technical faculty ($p = 0.000$). There was also a significant difference between the percentage of SEM faculty who had attended a community college and the non-SEM arts and science faculty ($p = 0.041$). The counts and percentages by faculty groups are summarized in Table 4.9.

Table 4.9

Attendance at a Community College by Faculty Groups

| | SEM faculty | Non-SEM faculty | CT faculty |
|--|-------------|-----------------|-------------|
| Number (%) having attended a community college | 151 (27.8%) | 246 (37.8%) | 433 (63.0%) |

Note. SEM = Science, engineering, and mathematics; CT = Career and technology.

Overall Job Satisfaction

Community college faculty members were overwhelmingly satisfied with their job; in fact, 93.5% of the survey respondents responded that they were satisfied or very satisfied with their job. In the survey, faculty were asked to rate their level of satisfaction with their job on a four-point Likert-type scale ranging from *very dissatisfied* to *very satisfied*. A summary of their responses is shown in Table 4.10, first for all faculty and then by faculty groups. In an independent samples t test, there was no significant difference between the mean overall job satisfaction when comparing arts and science faculty with career and technical faculty ($p = 0.609$), nor was there any significant difference between the mean overall job satisfaction when comparing SEM faculty with non-SEM faculty ($p = 0.302$).

Table 4.10
Satisfaction with Your Job Responses^a

| Faculty group | <u>Very dissatisfied</u> | | <u>Dissatisfied</u> | | <u>Satisfied</u> | | <u>Very satisfied</u> | | N | M | SD |
|------------------------|--------------------------|-----|---------------------|-----|------------------|------|-----------------------|------|-----|------|-------|
| | n | % | n | % | n | % | n | % | | | |
| All faculty | 12 | 1.5 | 42 | 5.1 | 479 | 57.9 | 294 | 35.9 | 827 | 3.28 | 0.624 |
| Arts & science faculty | 8 | 2.1 | 20 | 5.2 | 221 | 57.6 | 135 | 35.2 | 384 | 3.26 | 0.649 |
| Career & tech. faculty | 4 | 1.0 | 20 | 5.2 | 227 | 58.5 | 137 | 35.3 | 388 | 3.28 | 0.607 |
| SEM faculty | 1 | 0.7 | 8 | 5.7 | 76 | 54.3 | 55 | 39.3 | 140 | 3.22 | 0.615 |
| Non-SEM faculty | 3 | 1.4 | 12 | 5.5 | 130 | 59.6 | 73 | 33.5 | 218 | 3.25 | 0.619 |

^aFour-point Likert-type scale: 4 = very satisfied, 3 = satisfied, 2 = dissatisfied, 1 = very dissatisfied.

A similar survey question asked faculty to indicate their level of agreement with the statement “I enjoy my role as a community college instructor” on a four-point Likert-type scale ranging from *strongly disagree* to *strongly agree*. Their responses are summarized in Table 4.11. Although the combined percentages for the agree and strongly agree responses and for the disagree and strongly disagree responses were about the same for the questions about job satisfaction (Table 4.10) and enjoyment of role as a community college instructor (Table 4.11) when comparing by faculty group, there was a significantly higher percentage of faculty who responded strongly agree rather than agree in each faculty group in the question about enjoyment of role as a community college instructor. In independent sample *t* tests comparing the mean response by faculty groups, the mean overall job satisfaction was significantly lower than the mean enjoyment of role as an instructor for all faculty groups. This may indicate that faculty are more satisfied with the teaching aspect of their job. This idea was supported by faculty responses to the open-ended response question: “What do you enjoy the most about your job?” The overwhelming theme that emerged from their responses is their enjoyment of working with students, helping them and teaching them. One faculty member wrote,

I enjoy the students. I draw extreme job satisfaction from teaching in the classroom. When a student “gets it” that erases a lot of the other negative factors I put up with outside of the classroom and from the administrative culture of this campus.

Another faculty member stated,

My most favorable part of my job is the students! The students bring a smile to my face each and every day and let me know that I have made a difference. As influential as we are to students as instructors, the students are just as influential to us.

Faculty both early in their career and late in their career commented that students and teaching were what they found most rewarding about their jobs.

Table 4.11

Enjoyment of Role as an Instructor Responses^a

| Faculty group | Strongly disagree | | Disagree | | Agree | | Strongly agree | | N | M | SD |
|------------------------|-------------------|-----|----------|-----|-------|------|----------------|------|-----|------|-------|
| | n | % | n | % | n | % | n | % | | | |
| All faculty | 10 | 1.2 | 10 | 1.2 | 207 | 21.6 | 600 | 62.6 | 827 | 3.69 | 0.558 |
| Arts & science faculty | 5 | 1.3 | 3 | 0.8 | 93 | 24.2 | 284 | 73.8 | 385 | 3.70 | 0.550 |
| Career & tech. faculty | 3 | 0.8 | 6 | 1.5 | 102 | 26.3 | 277 | 71.4 | 388 | 3.68 | 0.543 |
| SEM faculty | 1 | 0.7 | 0 | 0.0 | 29 | 20.7 | 110 | 78.6 | 140 | 3.77 | 0.470 |
| Non-SEM faculty | 2 | 0.9 | 2 | 0.9 | 54 | 24.7 | 161 | 73.5 | 219 | 3.71 | 0.530 |

^aFour-point Likert-type scale: 4 = strongly agree, 3 = agree, 2 = disagree, 1 = strongly disagree.

Job Satisfaction Factors

Exploratory factor analysis was performed on selected survey items to determine which factors represented similar quantities. This process helps eliminate redundant variables along with unclear and irrelevant variables. After several EFA analyses, the following 13 factors were identified: (a) student preparation, (b) student support,

(c) recruitment and retention of students, (d) encouragement of students, (e) student interactions, (f) collegiality, (g) professional development on different learners, (h) conference presentations, (i) family friendliness, (j) physical environment, (k) benefits, (l) contentment, and (m) future plans. To determine that assumptions regarding a sufficient sample size and the suitability of the data to factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were computed. The KMO value should be high, namely close to 1.0. If it is less than .5, then factor analysis likely will not be useful. For the selected questions, the KMO value was 0.733. Bartlett's test has a null hypothesis that the correlation matrix is the identity matrix, which means that the variables are unrelated and, hence, unsuitable for factor analysis. Because the p value for Bartlett's test on the variables was 0.000, the null hypothesis was rejected, and the data are suitable for factor analysis. From the SPSS factor analysis output results, the scree plot was examined along with the eigenvalues to determine the number of factors, which was found to be 13. Next, factor loadings were examined to identify which items were grouped together as factors. According to Comrey and Lee (1992), factor loadings greater than 0.70 are excellent, greater than .63 are very good, 0.55 are good, 0.43 are fair, and less than 0.32 are poor. Of the items selected for incorporation into the model, all but two items had factor loadings greater than 0.70, and the factor loadings for those two items were 0.673 and 0.624. The factor loadings of the all items, grouped together by factors and then by blocks of similar characteristics are shown in Table 4.12.

Table 4.12

Summary of Factor Loadings

| Variable | Factor loadings |
|---|-----------------|
| Student Preparation and Support | |
| Student Preparation ($\alpha = .851$) | |
| Students in my classes demonstrate adequate writing skills. | 0.823 |
| Students in my classes demonstrate adequate critical thinking skills. | 0.801 |
| Students in my classes demonstrate adequate reading skills. | 0.785 |
| Students are well prepared academically for my classes. | 0.778 |
| Students in my classes demonstrate adequate math skills. | 0.770 |
| Student Support ($\alpha = 0.839$) | |
| Sufficient tutoring services are available for students in my classes. | 0.912 |
| Sufficient support services are available for students in my classes. | 0.883 |
| Interaction and Involvement with Students | |
| Recruitment and Retention of Students ($\alpha = 0.849$) | |
| It is my responsibility to aid in the retention of students with my discipline at my institution. | 0.925 |
| It is my responsibility to aid in the retention of students in my classes. | 0.883 |
| It is my responsibility to aid in the retention of students in my discipline when transferring to another institution. | 0.855 |
| Encouragement of Students ($\alpha = 0.792$) | |
| It is important that I encourage students to participate in social organizations and activities. | 0.857 |
| Students interested in the discipline I teach benefit from discipline-related student organizations. | 0.792 |
| It is important that I encourage students to participate in academic activities. | 0.791 |
| Student Interactions ($\alpha = 0.784$) | |
| Indicate how often you have social conversations about yourself with students. | 0.902 |
| Indicate how often you have social conversations with students about them. | 0.889 |
| Collegial Relations and Professional Growth | |
| Collegiality ($\alpha = 0.809$) | |
| I am recognized as an excellent teacher by colleagues. | 0.893 |
| I am valued by my colleagues for my service. | 0.846 |
| I feel that I fit in as a member of my department. | 0.743 |
| Professional Development on Different Learners ($\alpha = 0.728$) | |
| I have participated in training to teach diverse learners. | 0.833 |
| I have participated in training to teach adult learners. | 0.821 |
| I have participated in professional development on strategies to assist under-prepared students. | 0.722 |
| Conference Presentation ($\alpha = 0.659$) | |
| I have presented at a conference focused on teaching and instruction. | 0.840 |
| I have presented at a conference focused on my discipline. | 0.806 |
| Institutional Offerings and Support | |
| Family Friendliness ($\alpha = 0.710$) | |
| To be viewed favorably from administration at this institution, faculty members must put their jobs ahead of family/personal needs. | 0.852 |
| At this institution it is very hard to leave during the workday to take care of personal or family matters. | 0.842 |

Table 4.12 (continued)

| Variable | Factor loadings |
|--|-----------------|
| Physical Environment ($\alpha = 0.678$) | |
| Rate your level of satisfaction with you teaching space(s). | 0.859 |
| Rate your level of satisfaction with office space. | 0.754 |
| Rate your level of satisfaction with technology support. | 0.673 |
| Benefits ($\alpha = 0.670$) | |
| Rate your level of satisfaction with salary | 0.766 |
| Rate your level of satisfaction with opportunities for advancement | 0.715 |
| Rate your level of satisfaction with professional development offerings | 0.624 |
| Personal Outlook | |
| Contentment ($\alpha = 0.894$) | |
| If starting my career again, I would still return to this institution. | 0.862 |
| If starting my career again, I would still become a community college instructor in my discipline. | 0.837 |
| I would be very happy to spend the rest of my career at this institution. | 0.798 |
| This institution has a great deal of personal meaning for me. | 0.778 |
| Future Plans ($\alpha = 0.857$) | |
| I plan to look for a job within 3 years outside of academia. | 0.901 |
| I plan to look for a job within 3 years outside of the institution. | 0.801 |

After identifying the 13 factors through EFA, the Cronbach's alpha measure was computed to determine how well a set of variables measured a single factor. An alpha value of .6 to .7 is a lenient but acceptable measure of reliability, .7 to .8 is good, and higher than .8 is very good (UCLA Academic Technology Services (n.d.). All of the alpha values were higher than .6, over half of them were over .8, and only three of them were below .7 (.678, .670, and .659). These values also are listed in Table 4.12.

After the EFA, a model was developed for predicting job satisfaction of community college full-time faculty using the 13 factors found along with the three demographic variables of gender, age, and faculty group. The model had six blocks: demographics, student preparation, involvement with students, collegial relations and professional growth, institutional offerings and support, and personal outlook. Within each block are the factors

Table 4.13

Job Satisfaction Factors

| Demographics | Student Preparation and Support | Involvement with Students | Collegial Relations/ Professional Growth | Institutional Offerings | Personal Outlook |
|--------------|---|---|--|--|--|
| Age | Student Preparation (5 items) ($\alpha = 0.851$) | Recruitment and Retention (3 items) ($\alpha = 0.849$) | Colleagues (3 items) ($\alpha = 0.809$) | Family Friendliness (2 items) ($\alpha = 0.710$) | Contentment (4 items) ($\alpha = 0.894$) |
| Gender | Student Support (2 items) ($\alpha = 0.839$) | Encouragement (3 items) ($\alpha = 0.792$) | Professional Development (3 items) ($\alpha = 0.728$) | Physical Environment (3 items) ($\alpha = 0.678$) | Future Plans (2 items) ($\alpha = 0.857$) |
| | | Interactions (2 items) ($\alpha = 0.784$) | Conference Presentation (2 items) ($\alpha = 0.659$) | Benefits (3 items) ($\alpha = 0.670$) | |

associated with each block. Table 4.13 summarizes the factors in each block, the number of items in each factor, and the alpha value for the factor.

Multiple Regression Analysis

Multiple regression analysis was conducted to investigate the final research question, the extent to which the factors predict overall job satisfaction. The dependent variable was overall job satisfaction, as measured by the response to the question asking faculty to rate their level of satisfaction with their job. Using the 13 factors found in the EFA, composite scores were computed for each factor by taking the mean score of the items identified in the factor analysis. These 13 composite variables, along with gender and age, were the 15 independent variables. These independent variables were then grouped into six blocks: the first block consisted of the gender and age variables; the second block consisted of the student preparation and student support composite variables; the third block consisted of the recruitment and retention, encouragement and interaction composite variables; the fourth

block consisted of collegiality, professional development, and conference presentation composite variables; the fifth block consisted of the family friendliness, physical environment, and benefits composite variables; and finally the sixth block consisted of the contentment and future plans composite variables. The correlation matrix for all fifteen independent variables and the dependent variable may be found in Appendix E.

The six different models examined to predict job satisfaction were constructed by successively adding in the next block of variables. A summary of the ANOVA results from the multiple regression analysis are shown in Table 4.14; the adjusted R^2 value provides a measure of how well the linear model fits the data, so models with higher R^2 values are considered a better fit. Model 6 has the highest adjusted R^2 value of all the models. The p value listed in the table is used for testing the null hypothesis that the coefficients for all the independent variables are zero, so a linear regression model is not appropriate; likewise, for the alternative hypothesis that at least one of the coefficients for the independent variables is not zero, a linear regression model is appropriate. In all six models, the p value was less than

Table 4.14

Multiple Regression ANOVA Table for Predicting Job Satisfaction (N = 942)

| | Adjusted R^2 | SS | df | MS | F | p |
|---------|----------------|---------|----|--------|--------|------|
| Model 1 | .007* | 2.937 | 2 | 1.469 | 4.334 | .013 |
| Model 2 | .042** | 14.649 | 4 | 3.662 | 11.196 | .000 |
| Model 3 | .054*** | 19.600 | 7 | 2.800 | 8.673 | .000 |
| Model 4 | .079*** | 28.407 | 10 | 2.841 | 9.034 | .000 |
| Model 5 | .326*** | 107.645 | 13 | 8.280 | 35.992 | .000 |
| Model 6 | .473*** | 154.508 | 15 | 10.301 | 57.241 | .000 |

Note. SS = Sum of squares; MS = Mean square.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

.05 so the null hypothesis was rejected. There was sufficient support for concluding that at least one of the coefficients in the model for the predicting overall job satisfaction is not zero, so a linear regression model could be constructed.

To investigate which variables in each model contributed significantly to the linear model predicting job satisfaction, the coefficients of each variable were tested. The p values for each of these tests are listed in Table 4.15, which contains a summary of all the independent variables in each model. The key information is also summarized in Table 4.16, which lists the regression coefficients for each variable in each model and denotes which ones are significant. In the first model, age is the only variable that significantly contributed to the linear model predicting job satisfaction. In the second model, age, student preparation and student support all contributed significantly to the linear model predicting job satisfaction, but gender did not. In model 3, age, student preparation, student support and recruitment and retention contributed significantly to the linear prediction model, but gender, encouragement and interaction with students did not contribute significantly to the linear model for predicting overall job satisfaction. In model 4, the only additional variable that added to the previous model was collegiality. In model 5, recruitment and retention, collegiality, family friendliness, the physical environment and benefits all contributed significantly to a linear model predicting job satisfaction, but the other eight variables considered did not contribute significantly. Finally in model 6, eight variables were identified as contributing significantly to a linear model for predicting job satisfaction; the variables that did not contribute significantly were age, student preparation, student support, interactions with students, collegiality, professional development, and conference presentations.

Table 4.15

Coefficients of All Independent Variables for Predicting Job Satisfaction (N = 942)

| Independent variable blocks | <i>B</i> | <i>SE</i> | Beta | <i>p</i> |
|-----------------------------|----------|-----------|----------|----------|
| Model 1 | | | | |
| Gender | .057 | .038 | .048 | .139 |
| Age | .047 | .019 | .079* | .015 |
| Model 2 | | | | |
| Gender | .057 | .038 | .049 | .128 |
| Age | .059 | .019 | .099** | .002 |
| Student preparation | .218 | .044 | .159*** | .000 |
| Student support | .078 | .027 | .092** | .004 |
| Model 3 | | | | |
| Gender | .063 | .038 | .053 | .096 |
| Age | .064 | .019 | .107** | .001 |
| Student preparation | .213 | .044 | .155*** | .000 |
| Student support | .070 | .027 | .083* | .010 |
| Recruitment and retention | .116 | .035 | .111** | .001 |
| Encouragement | .001 | .042 | .001 | .974 |
| Interactions with students | .042 | .027 | .050 | .121 |
| Model 4 | | | | |
| Gender | .067 | .037 | .057 | .072 |
| Age | .052 | .019 | .087** | .007 |
| Student preparation | .185 | .044 | .135*** | .000 |
| Student support | .056 | .027 | .066* | .039 |
| Recruitment and retention | .111 | .034 | .106** | .001 |
| Encouragement | -.031 | .042 | -.026 | .454 |
| Interactions with students | .033 | .027 | .039 | .219 |
| Collegiality | .204 | .039 | .170*** | .000 |
| Professional development | -.008 | .053 | -.005 | .880 |
| Conference presentation | .023 | .052 | .014 | .659 |
| Model 5 | | | | |
| Gender | .043 | .032 | .037 | .178 |
| Age | .024 | .017 | .041 | .141 |
| Student preparation | .067 | .038 | .049 | .080 |
| Student support | -.002 | .023 | -.002 | .948 |
| Recruitment and retention | .092 | .029 | .088** | .002 |
| Encouragement | -.048 | .036 | -.040 | .178 |
| Interactions with students | .011 | .023 | .013 | .624 |
| Collegiality | .104 | .034 | .087** | .002 |
| Professional development | -.036 | .046 | -.022 | .429 |
| Conference presentation | .002 | .044 | .001 | .964 |
| Family friendliness | -.187 | .026 | -.204*** | .000 |
| Physical environment | .262 | .035 | .227*** | .000 |
| Benefits | .308 | .036 | .272*** | .000 |

Table 4.15 (continued)

| Independent variable blocks | <i>B</i> | <i>SE</i> | Beta | <i>p</i> |
|-----------------------------|----------|-----------|----------|----------|
| Model 6 | | | | |
| Gender | .064 | .028 | .055* | .024 |
| Age | .012 | .015 | .020 | .425 |
| Student preparation | -.001 | .034 | .000 | .984 |
| Student support | .002 | .021 | .002 | .919 |
| Recruitment and retention | .066 | .026 | .063* | .012 |
| Encouragement | -.069 | .032 | -.057* | .029 |
| Interactions with students | .017 | .020 | .020 | .411 |
| Collegiality | .009 | .031 | .008 | .769 |
| Professional development | -.070 | .041 | -.042 | .087 |
| Conference presentation | .018 | .039 | .011 | .647 |
| Family friendliness | -.115 | .024 | -.125*** | .000 |
| Physical environment | .202 | .031 | .175*** | .000 |
| Benefits | .137 | .034 | .121*** | .000 |
| Contentment | .330 | .030 | .330*** | .000 |
| Future plans | -.170 | .023 | -.209*** | .000 |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 4.16

Standard Regression Coefficients for Predicting Job Satisfaction (N = 942)

| Variable blocks | Standard regression coefficients (beta) | | | | | |
|----------------------------|---|---------|---------|---------|----------|----------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Gender | .048 | .049 | .053 | .057 | .037 | .055* |
| Age | .079* | .099** | .107** | .087** | .041 | .020 |
| Student preparation | | .159*** | .155*** | .135*** | .049 | .000 |
| Student support | | .092** | .083* | .066* | -.002 | .002 |
| Recruitment and retention | | | .111** | .106** | .088** | .063* |
| Encouragement | | | .001 | -.026 | -.040 | -.057* |
| Interactions with students | | | .050 | .039 | .013 | .020 |
| Collegiality | | | | .170*** | .087** | .008 |
| Professional development | | | | -.005 | -.022 | -.042 |
| Conference presentation | | | | .014 | .001 | .011 |
| Family friendliness | | | | | -.204*** | -.125*** |
| Physical environment | | | | | .227*** | .175*** |
| Benefits | | | | | .272*** | .121*** |
| Contentment | | | | | | .330*** |
| Future plans | | | | | | -.209*** |
| Adjusted R^2 | .007* | .042*** | .054*** | .079*** | .326*** | .473*** |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

After examining these different models, it appears that all but 3 of the 15 independent variables contributed to at least one of the six models for predicting job satisfaction. The three variables that did not contribute significantly to any of the six models were interactions with students, professional development, and conference presentations. Of the variables that did contribute significantly to a linear model of job satisfaction, the majority had positive coefficients, indicating that as the values of these variables increased, overall job satisfaction would also increase. Three variables that contributed significantly to a linear model, encouragement, family friendliness, and future plans, had negative coefficients, indicating that as their value increased, overall job satisfaction decreased.

To investigate how well the different models predicted job satisfaction for different faculty groups, a multiple regression analysis was performed for each of the following faculty groups: arts and science faculty; career and technical faculty; SEM faculty, and other arts and science (non-SEM) faculty. The adjusted R^2 was computed for each faculty group and models; the values are summarized in Table 4.17 along with the adjusted R^2 is for the entire faculty.

Models 3, 4, 5, and 6 were significant for all faculty groups, with the best model, as measured by the highest adjusted R^2 , being model 6. The standardized coefficient tables for each faculty group are included in Appendix F. The models improved substantially across all faculty groups when blocks 5 and 6 were added, indicating that the variables in blocks 5 and 6 are the strongest in predicting job satisfaction. In comparing model 6 across faculty groups, the model fits arts and science faculty the best.

Table 4.17

Multiple Regression Adjusted R² by Faculty Groups

| Model | SEM (N = 153) | Non-SEM (N = 245) | A&S (N = 427) | C&T (N = 439) | All faculty (N = 942) |
|---------|------------------|----------------------|------------------|------------------|--------------------------|
| Model 1 | -.013 | .003 | .001 | .015* | .007* |
| Model 2 | .061** | .018 | .044*** | .067*** | .042** |
| Model 3 | .056* | .038* | .049*** | .084*** | .054*** |
| Model 4 | .085* | .056** | .073*** | .109*** | .079*** |
| Model 5 | .265*** | .330*** | .323*** | .359*** | .326*** |
| Model 6 | .461*** | .478*** | .506*** | .470*** | .473*** |

Note. SEM = science, engineering and mathematics faculty, non-SEM = other arts and science faculty, A&S = arts and science faculty, C&T = career and technical faculty.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

To further examine model six, the standardized coefficients for each independent variable are listed by faculty groups in Table 4.18. The variables in blocks five and six were significant for nearly every faculty group. Of these five independent variables: family friendliness, physical environment, benefits, contentment and future plans, the largest coefficients are for the contentment and future plans variables. This indicates that these two variables have the largest impact on overall job satisfaction; moreover they have between two to five times the impact on overall job satisfaction when compared to the variables in block five (family friendliness, physical environment and benefits). For example, for SEM faculty the contentment variable has a standardized coefficient of 0.309 which is three times larger than the benefits coefficient of 0.103, so it has three times the impact on overall job satisfaction compared to benefits.

In examining the signs of the coefficients of the independent variables in blocks five and six, both family friendliness and future plans have negative coefficients for every faculty group. This indicates that as the mean response to those composite variables increases the

mean overall job satisfaction decreases. The wording of the questions in the survey for the family friendliness variables are negative, so this inverse relationship is not surprising. The first question states: “to be viewed favorably from administration at this institution, faculty members must put their jobs ahead of their families or personal life,” and the second questions states: “at this institution it is very hard to leave during the workday to take care of personal or family matters.” The negative coefficient for the future plans variable is not surprising since a higher mean response to the questions regarding faculty intentions to leave in the next three years corresponds to a lower overall job satisfaction response.

Table 4.18

Standard Regression Coefficients for Predicting Job Satisfaction Model 6 by Faculty Groups

| Variable blocks | Standard regression coefficients (beta) for Model 6 | | | | |
|----------------------------|---|------------------|------------------|------------------|----------------------|
| | All faculty (N = 942) | A&S (N = 427) | C&T (N = 439) | SEM (N = 153) | Non-SEM (N = 245) |
| Gender | .055* | .071* | .071 | 1.035 | .053 |
| Age | .020 | -.025 | .057 | -.999 | -.027 |
| Student preparation | .000 | .004 | .039 | -.302 | -.064 |
| Student support | .002 | .043 | -.050 | 2.390* | -.031 |
| Recruitment and retention | .063* | .045 | .048 | -.354 | .102 |
| Encouragement | -.057* | -.072 | -.038 | -2.355* | -.006 |
| Interactions with students | .020 | .016 | .046 | .215 | .022 |
| Collegiality | .008 | .021 | .022 | -.292 | .010 |
| Professional development | -.042 | -.072* | -.005 | -.168 | -.089 |
| Conference presentation | .011 | .046 | -.001 | .645 | .023 |
| Family friendliness | -.125*** | -.106** | -.153*** | -.291 | -.099* |
| Physical environment | .175*** | .172*** | .168*** | 1.969 | .259*** |
| Benefits | .121*** | .105* | .149** | 1.664 | .103 |
| Contentment | .330*** | .363*** | .257*** | 5.362*** | .309*** |
| Future plans | -.209*** | -.232*** | -.215*** | -2.067* | -.245*** |
| Adjusted R ² | .473*** | .506*** | .479*** | .461*** | .478*** |

Note. A&S = arts and science faculty, C&T = career and technical faculty, SEM = science, engineering and mathematics faculty, non-SEM = other arts and science faculty.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

CHAPTER 5. SUMMARY AND DISCUSSION

Summary

Community colleges are an important component in the higher education system of the United States. Community colleges help meet the increasing demand for a variety of educational degrees and training, and according to Carnevale and associates (2010), postsecondary education and training are necessary to obtain higher paying jobs. For community colleges to provide this education they face a challenge in managing one of their largest resources, namely their faculty, who are “the very heart and soul of community college” (Hardy & Lanaan, 2006, p. 787). There are forecasts that up to three-fourths of the full-time faculty at community colleges will retire within the next few years (Fleming, 2002). In addition to anticipated retirements, there are also increasing shortages of faculty in the STEM disciplines, which makes recruiting and retaining qualified faculty in these disciplines a “critical factor”.(Barnett & San Felice, 2006).

To help community colleges manage this valuable resource—their faculty—this study examined data collected from all 15 community colleges in Iowa. In particular, this study investigated the demographics and backgrounds of community college SEM faculty and examined different models for predicting their overall job satisfaction. The survey used to collect the data was developed specifically for community college faculty, unlike many other surveys used in faculty job satisfaction analysis that were designed primarily for faculty at 4-year institutions.

The population of the study was all full-time community college faculty members teaching in Iowa in the spring of 2011. A total of 958 faculty participated in the survey, representing all 15 community colleges in Iowa, with a response rate of 45.64%.

After the data from the survey were cleaned, SPSS software was used to compute descriptive statistics and frequency distributions and to compare means and proportions by performing chi-square tests and 2-independent sample t tests. Exploratory factor analyses were performed on selected questions from the survey to determine factors that could then be examined as to how they affect job satisfaction. Multiple regression analysis was then performed to compare how well various models predicted overall job satisfaction.

The intent of this study was to provide information for administrators, human resource managers, and faculty supervisors. The findings provide a view of current faculty through an examination of their demographic composition and backgrounds by faculty discipline groups. The findings also provide insight into the factors that affect full-time faculty job satisfaction, which can assist in the retention of the current faculty and aid in the recruitment of new faculty. This chapter comprises a discussion of the findings for each of the four research questions, the limitations of this study, implications for what could be done in the future, further research, and a final summary.

Discussion

Demographic Characteristics

This study examined data from the Iowa community college full-time faculty survey in part to investigate gender, age, race and marital status of SEM faculty. One interesting finding was that the demographics of Iowa community college full-time SEM faculty were different from 4-year SEM faculty. In the United States there is a noticeable gender imbalance in the SEM disciplines at degree-granting colleges and universities where only 18% of the science faculty and only 19% of the mathematics faculty are female (Hill et al., 2010). Of the 153 SEM community college faculty who responded to the survey, 47.1%

were female; furthermore, 44.6% of the science faculty were female as were 51.5% of the mathematics faculty. This contrasts dramatically to the gender balance at degree-granting colleges and universities in the United States. This more equal distribution of gender also is seen clearly in the non-SEM faculty at community colleges in Iowa, where of the 935 faculty respondents, 54.4% were female.

Another demographic characteristic of interest is the age of faculty. The mean age of faculty has been increasing and, due to the baby boomers in the United States, a large number of faculty are approaching retirement age; in fact, some estimates indicate that up to three-fourths of full-time faculty at community colleges will retire in the next few years (Fleming, 2002). This concern is validated in the data collected from the survey. The mean age of all faculty who responded to the survey was 48.95 years, and 35% of them were 55 years or older. Of the SEM faculty, the percentages were slightly lower, as 30.4% of the SEM faculty and 39.1% of non-SEM faculty identified as 55 years or older. Since 1990 there has been no mandatory retirement age for faculty, so age does not necessarily mean that faculty will be retiring. In fact, faculty responses to the question “I plan to retire from this job within 3 years” indicate that not all of the faculty in this later stage of their career will soon be retiring. Of the SEM faculty who were 55 years or older, 45.2% responded that they planned to retire in the next 3 years, and 38.4% of the non-SEM faculty in this age group responded that they planned to retire in the next 3 years. Less than one-fifth (17.5%) of all faculty who responded to the survey indicated that they planned to retire in the next 3 years, including 13.5% of the SEM faculty and 17.5% of the non-SEM faculty. Clearly there will be a number of faculty positions to be filled.

Iowa is a very homogeneous state ethnically, and 91.3% of the overall population identifies as White (US Census Bureau, 2010). Full-time faculty at community colleges in Iowa are even more homogeneous with 95.8% indicating that they are White. Of the SEM faculty, 94.1% identified as White, as did 97.1% of the non-SEM faculty. The lack of ethnic diversity of the faculty is a challenge that community colleges in Iowa need to address.

There is also a lack of diversity with regard to the marital status of full-time community college faculty. Of the 815 respondents to the question on marital status, 78.6% of them reported that they were married, followed by 11.4% who were separated, divorced, or widowed; 7.6% who were single and never married; and 2.8% who were living with a partner or significant other. The distribution of the SEM faculty (76.6% married; 8.0% separated, divorced or widowed; 12.4% single; and 2.9% living with a partner) and the non-SEM faculty (76.3% married; 10.7% separated, divorced or widowed; 9.3% single; and 3.7% living with a partner) was very similar to faculty responses as a whole.

Background Characteristics

The Iowa Department of Education (2011) requires that community college faculty teaching college credit courses have a master's degree in the subject that they are teaching or 12 graduate hours in the subject they are teaching along with a master's degree in another field. The survey did not include a question about the highest degree obtained, but rather the survey asked faculty what degrees they had attained, allowing faculty to check all that applied. For example, a faculty member could have a bachelor's degree, a master's degree and a doctoral degree. Of the SEM faculty, 16.8% had a doctoral degree, which was higher than the 13.0% of the non-SEM faculty who had a doctoral degree and, not surprisingly, much higher than 1.8% of the career and technical faculty who had a doctoral degree. Over

half of the SEM faculty (51.8%) and the non-SEM (55.6%) faculty had a master's degree, but again not surprisingly, only 29.7% of the career and technical faculty had a master's degree.

Many community college faculty have had experience teaching at the secondary level or are certified to teach at the secondary level. Of the SEM faculty in this study, 54.1% of them responded that they had certification to teach at the secondary level, and 47.4% of the non-SEM faculty responded they had certification to teach at the secondary level. When comparing the mean years of experience teaching at different levels of the SEM faculty with the non-SEM faculty, the only significant difference was at the high school level where the SEM faculty had a mean of 4.6 years of teaching experience and the non-SEM faculty had a mean of 2.8 years. The mean years of experience teaching at the community college level were 12.5 years for the SEM faculty and 14.1 years for the non-SEM faculty. Both faculty groups had spent most of their time teaching at the community college level at their current institution: SEM faculty had been teaching at their current institution for an average of 11.4 years and non-SEM faculty had been teaching at their current institution for an average of 12.8 years. This indicates a low turnover rate in faculty and that they generally stay at their present institution for a number of years.

Overall Job Satisfaction

One of the reasons that many community college faculty have chosen to stay at their institutions is because they are overwhelmingly satisfied with their jobs. In the responses to the question on their overall job satisfaction, 95.3% of the faculty stated that they were satisfied or very satisfied with their job. There were no statistically significant differences in the overall job satisfaction mean score between the SEM and non-SEM faculty or between the arts and science faculty and career and technical faculty. What is quite interesting is the

comparison of the responses to the overall job satisfaction question with the responses to the question regarding faculty's enjoyment of their role as a community college instructor. Although the combined percentages of the satisfied and very satisfied responses were relatively the same in response to the two questions, there was a much higher percentage of faculty who responded with very satisfied to the question regarding their role as an instructor compared to the question of satisfaction with their job. The mean score for responses to the question regarding their overall job satisfaction was significantly lower than the mean score for responses to the enjoyment of instructing. For the SEM faculty, the mean score for responses to the overall job satisfaction question was 3.22, which was significantly lower than the mean score of 3.77 for responses to the question on their enjoyment of their role as an instructor, both measured on a four-point Likert-type scale. This indicates that teaching and interacting with students are more satisfying aspects of their job than the other duties of their job.

Factors in Job Satisfaction

Because job satisfaction is a complex variable to predict and measure, many studies have identified a number of independent variables that affect overall job satisfaction. An interesting result of this study was identifying several new variables in the examination of job satisfaction. In particular, recruitment and retention of students, encouragement and interactions with students outside of class, and professional development opportunities with regard to teaching different types of learners (adult learners, underprepared learners, and diverse learners) were variables that had not previously been examined in most job satisfaction studies.

Also interesting was that all the questions from the survey in the professional development section that were identified in the factor analysis dealt with training on different types of learners or with presenting at a conference. Other questions in the professional development section of the survey did not have high enough factor loadings to be considered as a factor. In contrast, variables that previously have been considered in job satisfaction, technology support, professional development offerings, opportunities for advancement, and academic freedom at the institution, did not have high enough factor loadings to be considered.

Multiple Regression Analysis

In examining which blocks of variables had the greatest impact on job satisfaction, it appears the variables in blocks five and six contributed the greatest increase to the adjusted R^2 . The variables in block five were family friendliness, physical environment, and benefits. In both models 5 and 6, the coefficient on family friendliness was negative, indicating that as the response scores on the Likert-type scale became more positive, overall job satisfaction decreased. When examining the wording of the questions, this negative relationship is not surprising. The first question stated, “to be viewed favorably from administration at this institution, faculty members must put their jobs ahead of their families or personal life,” and the second question stated, “at this institution it is very hard to leave during the workday to take care of personal or family matters.” More positive responses on the Likert-type scale indicate that the administration and the culture at the institution are less family-friendly, which can lead to a decrease in job satisfaction.

In model 6, the coefficient on future plans was also negative. Again this means that higher Likert-type scale responses decrease overall job satisfaction. The two questions that

contributed to the composite score on this variable were: “I plan to look for a job within 3 years outside of this institution” and “I plan to look for a job within 3 years outside of academia.” More positive responses on the Likert-type scale indicated a higher likelihood of leaving the job and, hence, were a likely indicator of lower job satisfaction. The remaining variables in blocks five and six all had positive coefficients, indicating that as responses to those variables the Likert-type scale became more positive so did overall job satisfaction.

In considering how well the different models fit for SEM and non-SEM faculty, the adjusted R^2 was about the same. For SEM faculty, model 6 had the highest adjusted R^2 , .461, which means that 46.1% of the variation in overall job satisfaction was explained by the linear regression in model 6. Similarly, for non-SEM faculty, model 6 had the highest adjusted R^2 , 0.478. For both faculty groups, model 6 still did not describe job satisfaction completely; in fact, over half of the variation in job satisfaction was explained by variables not considered in this study.

Limitations

There are several limitations to be aware of when considering the results of this study. The study was based on data collected from a survey that was administered electronically in the spring of 2011. Faculty identified as full time by their institution were given 1 month to respond to the initial e-mail requesting their participation in filling out the survey. Because the survey was disseminated and administered electronically, faculty who did not have accurate e-mail addresses or who were not identified by the contact at the college were not able to respond.

Because the survey was voluntary and self-reported, the results reflect only those who chose to respond in the given timeframe. The survey was fairly lengthy, which may have

affected the response rate and the thoughtfulness of the responses to the questions, and the survey was administered near the end of the academic year, which is often a time when faculty have an increase in the demands on their time.

The survey was given only in the spring of 2011, so the findings reflect merely a snapshot in time and do not provide a measure of any changes that may occur over time. In addition, the survey was given only to faculty at community colleges in Iowa, so the findings may not represent faculty at community colleges in other states.

Implications

In Iowa 91.3% of the population is White (US Census Bureau, 2010), however the homogeneity of all community college faculty in Iowa is even more extreme with 95.5% of the respondents identifying as White. A similar distribution is reflected in all the faculty groups examined, as 94.1% of SEM faculty and 97.1% of the non-SEM faculty identified as White. The percentages of minority students at community colleges in Iowa are higher and furthermore their enrollments are increasing. According to the Iowa Department of Education Annual Condition of Iowa's Community College 2010 Report, 11.9% of the students enrolled in Iowa community colleges in 2009 were minorities, and in 2010 the percentage of minority students enrolled increased substantially to 14.5% (Iowa Department of Education, 2010). It is extremely important to have minority faculty role models for both minority and majority students. Minority faculty can help broaden student's knowledge and sensitivity to differences. They strengthen the offerings at the college by helping facilitate a broader perspective for students. It is even more critical in an area that is predominately white to help facilitate a broader view and exposure to differences by having minority faculty. As faculty positions open up with faculty retiring it is a prime opportunity to hire more minority faculty.

To attract more minority faculty applicants it is important to invest time and effort in both recruiting and retaining minority faculty.

Community college leaders need to work with area business and industry leaders to make their community more attractive to minorities. Business and industry leaders can work together to ensure that there are retail stores and services available to meet differing ethnic needs. For example, they can have grocery stores stock different types of ethnic foods and make sure that hair salons have stylists who are able to provide haircuts and styles for different ethnic groups. Community college faculty need to provide a welcoming environment for different ethnic faculty by inviting them into their homes and learning more about their culture.

There is strong evidence that the faculty at community colleges are aging; furthermore, very few young faculty are available to take their place because only 9.9% of all faculty are 34 years or younger. In both the SEM and non-SEM disciplines, the percentages of young faculty are similar, as 10.1% of SEM faculty and 10.9% of non-SEM faculty identified as 34 years or younger. Awareness about a career as a community college instructor needs to increase. This should take place at many levels by many people: faculty teaching in master's degree-granting institutions can inform their students of this career option; likewise, faculty at 4-year institutions and 2-year colleges can encourage their undergraduate students to consider community college teaching as a career choice. Outside of the classroom, at career fairs and other events, faculty can encourage people to consider teaching at a community college as an option. In addition, to attract younger faculty to teaching at community college, services such as day care can be offered at the college.

Additionally, faculty and staff groups can organize social gatherings to provide opportunities to get acquainted with others in the community and for support and entertainment.

Because community colleges serve students with a wide variety of backgrounds and educational experiences, providing professional development and training for faculty is important in order for them to best serve their students. In particular, training or education about teaching underprepared students and adult students is needed. Policymakers may want to include this training or education on teaching diverse students as a requirement for all community college faculty. Community college leaders should also provide training and professional development opportunities for faculty to learn more about working with these students.

Future Research

It is quite striking that there is no evidence at community colleges of the gender imbalance in SEM faculty at 4-year institutions and universities. Further investigation of reasons why community colleges seem to attract a higher percentage of females to the SEM field is needed. Identifying factors that make community colleges more appealing could then be applied to other institutions.

Several professional development training opportunities were identified in this study as contributing to overall job satisfaction. It would be useful to determine what other types of professional development or training is needed and/or desired by community college faculty. Furthermore, because some types of professional development opportunities did not seem as important or perhaps just were not utilized as much as others in contributing to job satisfaction, further research on these offerings could be useful in determining the best professional development offerings to provide.

Teaching and working with students appear to be aspects of faculty members' jobs that they truly enjoy; however, determining the aspects of their job that are not enjoyable, hence lowering job satisfaction, requires further research and investigation. As looming retirements approach, coupled with increased job opportunities outside of education, keeping the job of a community college faculty as satisfying as possible is essential. Given that faculty are one of the most significant resources at community colleges, focused efforts need to be made to attract and retain the best, highly qualified instructors. Job satisfaction continues to be a difficult variable to predict, in part because there are number of facets that contribute to job satisfaction. Further research as to the variables that do affect job satisfaction should be conducted. Because this study used data solely from Iowa community colleges, it would be useful to know whether or not similar results would be found with community college faculty in other states.

Technology has changed the world and the work environment, especially in the field of education. The impact of this on job satisfaction has not been investigated thoroughly. Although the survey had a few questions on the use of technology, further research into the role that technology plays is needed. More funds are being spent on technology, and it is used more often in teaching. Determining how best to utilize these resources is important. To prepare students for the 21st century, it is important for faculty to be current with technology, but this requires time and training. It would be useful to study what training and support would be most helpful in keeping faculty current with technology and in finding ways to effectively utilize technology in teaching. As more courses are offered online or as a hybrid course, it is important to study what instructional techniques and strategies are effective and what training and support are needed for teaching these courses.

Final Summary

The purpose of this study was to gain a better understanding of community college SEM faculty, who they are, their job satisfaction level, and how they compare with other community college faculty. SEM faculty are an important commodity, as there is an increasing demand for workers with strong backgrounds and knowledge in science, engineering and mathematics. Along with this competition is the fact that a large proportion of the SEM faculty are in their middle or late career stages, nearing retirement. Community colleges must retain their current SEM faculty and prepare to recruit qualified SEM faculty to meet anticipated needs. In a tough economic climate, it is important to manage all resources well—and faculty are one of the most important resources that community colleges have.

The responses from the survey given to full-time faculty at all 15 community colleges in Iowa give a snapshot of community college SEM faculty. According to the survey, 94.1% of SEM faculty are White, and they are fairly evenly split between the genders with 47.1% identifying as female. The mean age of all SEM faculty is 48.3 years, with 59.4% between the ages of 35 and 54 years. The majority of the them are in the middle of their career; an additional 30.4% are in the late stage of their career, leaving only 10.1% in the early stage of their career. They are quite experienced, having taught at their current institution for an average of 11.4 years. Of the SEM faculty, 16.8% had a doctoral degree; faculty who teach college level courses are required by the Iowa Department of Education (2011) to have a master's degree in the field they teach or 12 graduate hours in the field they teach in addition to a master's degree in another field.

Overwhelming SEM faculty, along with all community college faculty, are satisfied with their job, as 93.6% of the SEM faculty indicated they were either satisfied (54.3%) or

very satisfied (39.3%). One aspect of their job that they particularly enjoy is teaching, as indicated by the 99.3% who responded that they either agreed (20.7%) or strongly agreed (78.6%) with the statement that they enjoy their role as a community college instructor. Thus, the mean score response of 3.77 to this question on enjoyment of teaching was significantly higher than the mean score response of 3.22 to the overall job satisfaction question.

To further examine job satisfaction, 13 factors that identified in the factor analysis were then used as independent variables to explore job satisfaction prediction models using multiple regression. In addition to the 13 factors identified from factor analysis, 2 other independent variables, age and gender, were also used in the models for job satisfaction. The following six blocks were used: demographics, student preparation and support, involvement with students, collegial relations and professional growth, institutional offerings, and personal outlook. The last two blocks, institutional offerings and personal outlook, had the largest impact on the models as measured by the increases in the adjusted R^2 values. The institutional offerings block consisted of three composite variables: family friendliness, physical environment and benefits. The personal outlook block consisted of two composite variables: contentment and future plans. Job satisfaction continues to be a difficult dependent variable to predict. There is no perfect model, but it is important to strive to further understand faculty job satisfaction.

Community college faculty are indeed different than faculty at 4-year institutions and universities. Community colleges play a vital role in the higher education system of the United States, and as the demands for more higher education and training increase, community colleges need to have qualified, satisfied faculty to help meet these demands.

APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 3/23/2011

To: Kathy Rogotzke
2631 155th St
Charles City, IA 50616

CC: Dr. Frankie Santos Laanan
N225A Lagomarcino
Dr. Larry Ebbers
N256 Lagomarcino Hall

From: Office for Responsible Research

Title: Iowa Community College Faculty Survey

IRB Num: 10-145

Approval Date: 3/21/2011 **Continuing Review Date:** 7/7/2011

Submission Type: Modification **Review Type:** Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University. Please refer to the IRB ID number shown above in all correspondence regarding this study.

Your study has been approved according to the dates shown above. To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting the "Continuing Review and/or Modification" form.
- **Immediately inform the IRB** of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- **Stop all research activity if IRB approval lapses**, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Research investigators are expected to comply with the principles of the Belmont Report, and state and federal regulations regarding the involvement of humans in research. These documents are located on the Office for Responsible Research website <http://www.compliance.iastate.edu/irb/forms/> or available by calling (515) 294-4566.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

APPENDIX B. IOWA COMMUNITY COLLEGE FULL-TIME FACULTY SURVEY 2011

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Iowa Community College Faculty Survey 2010-2011

Thank you for your willingness to help with this survey. The purpose of this survey is to collect information that will help us better understand the demographics, background, perceptions, practices and needs of Iowa's full-time community college faculty members.

INSTRUCTIONS: This survey is for all full-time faculty who are teaching at a community college. Your responses to the questions are voluntary and strictly confidential. They will be used only in statistical summaries. You may skip any question you are not comfortable answering. There are nine sections which we estimate will take about 20 minutes to complete.

If you have any questions or problems feel free to contact: Jane Bradley (bradley@swccowa.edu, 641-782-1338); Michael Miller (memiller@indianhills.edu, 641-683-5226); or Kathy Rogotkze (rogotkat@niacc.edu, 641-422-4154).

We greatly appreciate your time in completing the survey.

I. EMPLOYMENT/EDUCATION INFORMATION

1. Do you have full-time faculty status as defined by your institution for the 2010 - 2011 academic year?

- Yes
 No

2. What was your principal activity at your current institution during the 2010-2011 Academic Year? (If you have equal responsibilities, please select one.)

- Teaching
 On sabbatical
 Support services (e.g. technical activity such as programmer or technician; other institutional activities such as library services; subsidized performer, artist-in-residence, etc.)
 Other, please list activity

3. What area is your primary teaching responsibility in this academic year (Fall 2010 - Spring 2011)?

- Arts and Science

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 Career and Technical Other, please list area**During this academic year (Fall 2010 - Spring 2011), in which discipline is the MAJORITY of your teaching assignment in?** Fine Arts (indicate the discipline in the space below such as Art, Music, etc.) Communications (indicate the discipline in the space below such as English, Speech, etc.) Humanities (indicate the discipline in the space below such as History, Philosophy, etc.) Business (indicate the discipline in the space below such as Accounting, Computer Science, etc.) Social Sciences (indicate the discipline in the space below such as Economics, Psychology, etc.) Physical or Natural Sciences (indicate the discipline in the space below such as Biology, Chemistry, etc.) Mathematics Engineering Other, please list discipline**During this academic year (Fall 2010 - Spring 2011), in which discipline is the MAJORITY of your teaching assignment in?** Agricultural Business and Information Technology Family and Consumer Science Health Occupations Industrial Technology Marketing Other, please list discipline**4. Are you a member of a union or other bargaining association that is legally recognized to represent faculty at your institution?** Yes No Skip this question

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If no, what was your reason for not belonging to a union or other bargaining association to represent the faculty at your institution?

- A union is not available.
- A union is available but I am not eligible to join.
- A union is available but I decided not to join.
- Other, please list reason

5. What degrees have you completed? Do not include honorary degrees. (Check all that apply. If you have none of the degrees or awards, select "Not applicable.")

- Doctoral degree (Ph.D., Ed.D. etc.)
- First-professional degree (M.D., D.O., D.D.S, etc.)
- Master's degree
- Bachelor's degree
- Associate's degree or equivalent (AA, A.S., etc.)
- Certificate or diploma for completion of undergraduate program (other than associate's or bachelor's degree)
- Not applicable (Do not hold a degree)

In which field of study is your Doctoral degree?

In which field of study is your Master's degree?

In which field of study is your Bachelor's degree?

6. How many years teaching experience do you have in each of the following educational settings? Do not include teaching assistant, substitute teaching or student teaching experience. Also indicate whether you have (or had) certification to teach at each level.

| | Number of years of experience. | Have (or had) certification to teach at this level. |
|----------------------------------|--------------------------------|---|
| Elementary School (grades K - 6) | Enter 0 for none | Yes <input type="checkbox"/> |

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| | | |
|---------------------------------|--------------------------|--------------------------|
| Middle School (grades 6 - 8) | <input type="checkbox"/> | <input type="checkbox"/> |
| High School (grades 9 - 12) | <input type="checkbox"/> | <input type="checkbox"/> |
| Community College | <input type="checkbox"/> | <input type="checkbox"/> |
| Four-year college or university | <input type="checkbox"/> | <input type="checkbox"/> |

7. How many years have you taught at your current institution (including the current 2010-2011 academic year)?

8. Did you attend a community college before becoming a faculty member at a community college?

- Yes
 No

II. RESPONSIBILITIES AND WORKLOAD

9. Enter the total number of credit hours you are teaching or will teach at your current institution:

| | Total credit hours |
|-----------------------------|----------------------|
| During the Fall 2010 term | <input type="text"/> |
| During the Spring 2011 term | <input type="text"/> |

10. Enter the total number of credit hours you are teaching or will teach at other institutions:

| | Total credit hours |
|-----------------------------|----------------------|
| During the Fall 2010 term | <input type="text"/> |
| During the Spring 2011 term | <input type="text"/> |

11. During a typical 7-day week, about how many hours on average do you spend doing each of the following? (Please respond to each item.)

| | 0 | 1 - 4 | 5 - 8 | 9 - 12 | 13 - 16 | 17 - 20 | 21 or more |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Preparing for classes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| b. Lab preparation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Grading | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. In regularly scheduled office hours (in person or on-line) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Communicating with students via email | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Supervising internships or other field experiences | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Advising students | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Working with students on activities other than course work (committees, clubs, orientation, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Working with honors' projects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Administrative activities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. College committees | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| l. Mentoring other faculty | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| m. Talking/visiting area industries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

III. TEACHING AND LEARNING

12. What instructional techniques/methods did you use for the classes you taught for credit during the Fall 2010 term?

| | Not used | Used some of the time | Used most of the time | Used all the time |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Lecturing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Class discussions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Cooperative learning (group work) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Reflective writing/journaling | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Inquiry based learning | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Experiential learning/Field studies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Automatic response systems (e.g. clickers) with immediate feedback in class | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

13. What methods did you use to evaluate students in the classes you taught for credit during the Fall 2010 term?

| | Not used | Used some of the time | Used most of the time | Used all the time |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Multiple-choice questions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Essay questions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Short-answer questions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Quizzes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Homework assignments | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Student presentations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| g. Research papers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Projects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Lab assignments | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

14. What technology did you use for the classes you taught for credit during the Fall 2010 term? (Web sites used for instructional duties might include the syllabus, readings, assignments, and practice exams for classes.)

| | Not used | Used some of the time | Used most of the time | Used all of the time |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Websites for course information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. On-line course management system (e.g. WebCt, Blackboard, Angel) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Publisher developed site (e.g. My Math Lab) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Pod casting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Other, please list <input type="text"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Other, please list <input type="text"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

15. What means did you use to communicate with your students during the Fall 2010 term?

| | Not used | Used some of the time | Used most of the time | Used all of the time |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Email | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Face-to-face | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Phone calls | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Facebook | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Other, please list <input type="text"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Other, please list <input type="text"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

16. Enter the total number of courses in which you used the following delivery methods during the Fall 2010 term.

| | Number of courses | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Did not use | 1 | 2 | 3 | 4 | 5 or more |
| a. On-line or web delivery | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Hybrid delivery (combination of face to face and on-line delivery) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Iowa Communications Network (ICN) delivery | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

IV. PROFESSIONAL DEVELOPMENT

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17. Which of the following have you participated in while employed by your current institution? For those that you have participated in, evaluate the usefulness of the experience.

| | Participation in | | Usefulness | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Yes | No | Not useful | Somewhat useful | Useful | Very Useful | N/A |
| a. Workshops focused on teaching/instructional techniques | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Workshops focused on the discipline in which you teach | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. On-line course or tutorial focused on teaching/instructional techniques | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. On-line course or tutorial focused on the discipline in which you teach | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. National conference focused on teaching and instruction | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. National conference focused on my discipline | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Presented at a conference focused on teaching and instruction | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Presented at a conference focused on my discipline | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

18. Are you currently pursuing a more advanced degree or interested in pursuing a more advanced degree?

- Yes, I am currently pursuing a more advanced degree.
- No, I am not currently pursuing a more advanced degree but I am interested in pursuing one in the future.
- No, I am not currently pursuing a more advanced degree and I do not plan to do so in the future.

In which field are you pursuing a more advanced degree?

19. Which of the following have you participated in while employed by your current institution? (Check all that apply, checking N/A indicates that, to your knowledge, your institution does not make this opportunity available.) For those that you have participated in evaluate the usefulness of the experience.

| | Participated in | | | Usefulness | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Yes | No | N/A | Not useful | Somewhat Useful | Useful | Very Useful | N/A |
| a. New faculty orientation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Mentoring by a senior faculty member in a formal program | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| c. Serving as a mentor to a new faculty member in a formal program | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Lunch-n-Learn/Brown bag seminar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Professional development on strategies to assist under-prepared students | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Paid travel to conferences/workshops | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Association membership dues paid by the institution | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Tuition remission for courses taken at your institution | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Tuition reimbursement for courses taken at another institution | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Paid sabbatical leave | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. Externship | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

20. Have you participated in original research in the following while employed by your current institution? Check all that apply.

| | Yes | No |
|--------------------------------------|-----------------------|-----------------------|
| Research in your disciplinary field | <input type="radio"/> | <input type="radio"/> |
| Research in teaching and instruction | <input type="radio"/> | <input type="radio"/> |

Was your research in your disciplinary field published or do you plan to publish it?

- Yes, it has been published.
- No, it has not been published, but I plan to publish it.
- No, it has not been published, nor do I plan to publish it.

Was your research in teaching and instruction published or do you plan to publish it?

- Yes, it has been published.
- No, it has not been published, but I plan to publish it.
- No, it has not been published, nor do I plan to publish it.

V. STUDENT RELATIONS

21. Considering all the students you teach, indicate on average your level of agreement with the following statements about student preparedness, and resources available:

| | Level of agreement | | | | |
|--|--------------------|----------|-------|----------|-------|
| | Strongly | Disagree | Agree | Strongly | Don't |
| | | | | | |

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| | disagree | | agree | know |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Students are well prepared academically for my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Students in my classes demonstrate adequate critical thinking skills. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Students in my classes demonstrate adequate reading skills. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Students in my classes demonstrate adequate writing skills. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Students in my classes demonstrate adequate math skills. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Students effectively utilize learning resources for my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Sufficient support services are available for students in my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Sufficient tutoring services are available for students in my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Students put in adequate effort to be successful in my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Students struggle in my classes because of the demands placed on them by their employment. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. Students struggle in my classes because of the demands placed on them by their family responsibilities. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| l. Students struggle in my classes because of financial stress. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

22. Indicate your level of agreement with the following statements about your interactions with students:

| | Level of agreement | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Strongly disagree | Disagree | Agree | Strongly agree | Don't know |
| a. I consider myself a mentor to the students in my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. It is my responsibility to recruit students into majors in my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. It is important for me to recruit in a way that maintains or helps establish gender balance in my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. It is important for me to recruit students of color into my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. It is my responsibility to aid in the retention of students in my classes. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. It is my responsibility to aid in the retention of students within my discipline at my institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. It is my responsibility to aid in the retention of students within my discipline when transferring to another institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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23. Indicate your level of agreement about academic and social groups:

| | Levels of agreement | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Strongly disagree | Disagree | Agree | Strongly agree | Don't know |
| a. Students interested in the discipline I teach benefit from discipline related student organizations. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Students interested in the discipline I teach benefit from discipline related job shadowing or internship opportunities. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. It is important that I encourage students to participate in social organizations and activities. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. It is important that I encourage students to participate in academic activities. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

24. Indicate how often you interact with students outside of the classroom in the following ways:

| | Frequency | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| | Never | Rarely | Sometimes | Often |
| a. Greetings, waves or brief comments | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Answering questions or short discussions concerning academic issues | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Social conversations about the student | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Social conversations about yourself | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Counseling to provide emotional support | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Counseling to provide career or professional development advice | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

25. Indicate how often you engage in the following:

| | Frequency | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| | Never | Rarely | Sometimes | Often |
| a. Encourage students in my classes to major in my discipline | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Visit K-12 classes to encourage students to consider majors in my discipline | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Make presentations to potential students about career opportunities for individuals with degrees in my discipline | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

VI. PARTNERSHIPS**26. How often throughout your community college teaching career have you engaged in the following?**

| | Never | Rarely | Sometimes | Often |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Discussions concerning course content and articulation with four year college/university faculty. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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- | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| b. Discussions concerning course content and articulation with other community college instructors. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Discussions concerning course content and articulation with high school faculty. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Placement of students into job shadowing opportunities. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Placement of students into internships. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Finding employment for students. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. A grant partnership with a four year institution(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

VII. JOB CHOICE AND SATISFACTION

27. In the left column rate how important the following were in your decision to accept a position at your current institution, and in the right column rate how important the following are in your decision to continue working at your current institution.

| | Taking the job | | | | Continuing with the job | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|-----------------------|-----------------------|
| | Not important | Important | Very important | Essential | Not important | Important | Very important | Essential |
| a. Pay | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Job benefits | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Geographical location of the college | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Support for family | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Colleagues | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Emphasis on teaching | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Support for research | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Teaching load | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Office space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Support for technology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. Other, please list <input type="text"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

28. Indicate your level of agreement with the following statements about your department:

| | Levels of agreement | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Strongly disagree | Disagree | Agree | Strongly agree | Don't know |
| a. I feel that I fit in as a member of my department. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. I am recognized as an excellent teacher by my colleagues. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. I am valued by my colleagues for my service to the college (outside of my teaching duties). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Faculty in my department work hard to | | | | | |

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improve their teaching.

29. Indicate your level of agreement with the following statement about course transfer:

| | Levels of agreement | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Strongly disagree | Disagree | Agree | Strongly agree | Don't know |
| Courses in my discipline transfer to four year colleges and universities in a manner that is beneficial to students. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please share any comments you would like to about how courses transfer.

30. Indicate your level of agreement with the following statements about your institution:

| | Levels of agreement | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Strongly disagree | Disagree | Agree | Strongly agree | Don't know |
| a. I am satisfied with the level of academic freedom allowed me at my institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. In general, my immediate supervisor is quite accommodating of family-related needs. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. To be viewed favorably from administration at this institution, faculty members must put their jobs ahead of their families or personal lives. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. At this institution it is very hard to leave during the workday to take care of personal or family matters. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Faculty members often take work home at night and/or on weekends. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. I enjoy my role as a community college instructor. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. I am a valued employee at this institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. I am recognized as an excellent teacher by the administration at this institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Faculty members of color are treated equitably at my institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Female faculty members are treated equitably at my institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| k. This institution has a great deal of personal meaning for me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| l. I would be very happy to spend the rest of my career at this institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| m. If starting my career again, I would still become a community college instructor in my discipline. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| n. If starting my career again, I would still return to this institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

31. Rate your level of satisfaction with the following at your institution:

| | Very dissatisfied | Dissatisfied | Satisfied | Very Satisfied |
|---------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Your salary | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Your benefits package | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Your office space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Your teaching space(s) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Technology support | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Professional development offerings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Opportunities for advancement | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Your job | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

32. To what extent do you agree or disagree with the following statements?

| | Strongly disagree | Disagree | Agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. I have thought about leaving this job. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. I plan to look for a job within 3 years outside of this institution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. I plan to look for a job within 3 years outside of academia. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. I plan to retire from this job within 3 years. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. I plan to seek an administrative position within 3 years. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

33. From your perspective as a current instructor, how important are the following types of training for teaching at a community college?

| | Not important | Important | Very important | Essential |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Graduate coursework in your subject area | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Student teaching or guided practice teaching | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Teaching methods course | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Education courses | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| e. Community college history and culture courses | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Training and information about teaching diverse learners | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Training and information about teaching adult learners | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Training and information about teaching under prepared students | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

34. How helpful do you personally feel the following would be to help you balance your work life?

| | Not helpful | Somewhat helpful | Very helpful |
|---|-----------------------|-----------------------|-----------------------|
| a. Personal days | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Availability of substitute instructors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Career break/sabbaticals | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Time-off for family engagements/events | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Working from home | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Counseling services for employees | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Health programs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Parenting or family support programs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Exercise facilities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Sick leave sharing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

VIII. DEMOGRAPHICS

We are almost finished. The next questions will be about your compensation and your background. Your responses to these items—as with all the items on this survey—are voluntary and strictly confidential. They will be used only in statistical summaries.

35. What was your base salary during the last calendar year (Fall 2010 – Spring 2011) from your current institution? (Do not include summer pay and overload).

- Less than \$20,000
- \$20,000 - \$39,999
- \$40,000 - \$59,999
- \$60,000 - \$79,999
- \$80,000 - \$99,999
- \$100,000 or more

36. What length of time was your base salary for the last year based on? Enter the number of months. (Please answer based on length of your contract and how long you work rather than on the number of months you are paid.)

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37. How much compensation did you receive from other income from your current institution not included in your basic salary (e.g. for summer session, overload courses, administration, research, coaching sports, etc.)?

- Less than \$2,000
- \$2,000 - \$3,999
- \$3,000 - \$5,999
- \$6,000 - \$7,999
- \$8,000 - \$9,999
- \$10,000 or more

38. Are you?

- Male
- Female

39. How old were you on January 1, 2011?

- Younger than 25 years
- 25 - 34 years
- 35 - 44 years
- 45 - 54 years
- 55 - 64 years
- 65 - 74 years
- 75 years or older

40. Please select one or more of the following choices to best describe your race. Select all that apply.

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White
- Other

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41. What was your marital status on January 1, 2011? (select one)

- Single and never married
- Married
- Living with partner or significant other
- Separated or divorced or widowed

IX. OPEN ENDED QUESTIONS

This is the final section. These five open ended questions give you the opportunity to tell us more about your experience as a community college faculty member. We value your comments.

42. What do you enjoy the most about your job as a community college faculty member?**43. What do you enjoy the least about your job as a community college faculty member?****44. What would improve your job as a community college faculty member?****45. What advice do you have for future community college faculty members?**new.qualtrics.com/.../PopUp.php?PopT...

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46. Please describe important characteristics or qualities of an effective community college instructor.



Once you go to the next page this survey will be submitted and you will not be able to go back. If there are questions you want to check or review before you submit the survey please go back and do so now. We appreciate your thoughtful participation in this survey. Thank you!

If you have any questions or concerns feel free to contact any one of us: Jane Bradley (bradley@swcciova.edu , 641-782-1338); Michael Miller (memiller@indianhills.edu , 641-683-5226); or Kathy Rogotkze (rogotkat@niacc.edu, 641-422-4154).

APPENDIX C. PARTICIPANT LETTER

April 14, 2011

We are conducting a study that focuses on the experiences of full-time faculty members working in Iowa Community Colleges. The purpose of this study is to gain a better understanding of the demographics, background, perceptions, practices, and needs of Iowa's full-time community college faculty members. This research includes a web survey that asks about the academic and social experiences of full-time faculty members at the institution where you were working during the 2010-2011 academic year. The main objective is to learn more about the demographics, experiences and needs of full-time faculty.

As a full-time faculty member, you have been selected to participate in this study. I know this is a busy time of year, but please take approximately 20 minutes to answer the questions on this web survey. This is your opportunity to help us develop a better understanding of the experiences and needs of full-time faculty members working in Iowa's Community College system.

Your participation in this study is voluntary, and your willingness to participate will have no effect on your current status as a faculty member at your respective community college. Summary data will be provided to the college at the conclusion of this study. Results containing less than 10 cases/respondents will be suppressed to protect any indirect identification of participants. Your email address will be retained for follow-up communication only and will then be removed from the data set.

Your responses to this survey will remain completely confidential and secured and your name will never be associated with the answers you provide. In addition, you may skip any question(s) you do not wish to answer.

If you would like more information about this research project, or experience difficulty accessing the web survey, please to contact me at rogokat@niacc.edu or via telephone at (641) 422-4154. To contact the Iowa State University supervising faculty member for this research project, please call Dr. Larry Ebberts, at (515) 294-7292 or by email at lebberts@iastate.edu.

If you have any questions about the rights of research subjects or related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, Office of Research Assurances, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

Thank you for your time and attention and for supporting our efforts to gain a better understanding of the demographics, beliefs, needs and behaviors of Iowa's full-time community college faculty members.

Sincerely,

Kathy Rogotzke
Graduate Student, Educational Leadership and Policy Studies

APPENDIX D. SUMMARY OF SURVEY PARTICIPANTS' DEMOGRAPHICS

| Variable | <i>n</i> | % |
|--|----------|------|
| <i>Gender (N = 935)</i> | | |
| Female | 509 | 54.4 |
| Male | 426 | 45.6 |
| <i>Age (N = 819)</i> | | |
| Younger than 25 years | a | a |
| 25 – 34 | 81 | 9.9 |
| 35 – 44 | 184 | 22.5 |
| 45 – 54 | 268 | 32.7 |
| 55 – 64 | 256 | 31.3 |
| 65 – 74 | 27 | 3.3 |
| <i>Race/Ethnic Background (N = 808)</i> | | |
| American Indian or Alaska Native | 12 | 1.5 |
| Asian | a | a |
| African American | a | a |
| Hispanic | a | a |
| Hawaiian or Pacific Islander | a | a |
| White | 772 | 95.5 |
| <i>Marital status (N = 815)</i> | | |
| Single | 62 | 7.6 |
| Married | 637 | 78.2 |
| Living with Partner or Significant Other | 23 | 2.8 |
| Separated, Divorced or Widowed | 93 | 11.4 |
| <i>Salary (N = 814)</i> | | |
| Less than \$20,000 | a | a |
| \$20,000 - \$39,999 | 70 | 8.6 |
| \$40,000 - \$ 59,999 | 505 | 62.0 |
| \$60,000 - \$ 79,999 | 205 | 25.2 |
| \$80,000 - \$ 99,999 | 31 | 3.8 |
| \$100,000 or more | a | a |
| <i>Union Status (N = 888)</i> | | |
| No | 381 | 42.9 |
| Yes | 507 | 57.1 |

^aFewer than 10 respondents; values not reported.

APPENDIX E. PEARSON CORRELATION MATRIX

| | Job satis. | Gen-der | Age | Stud. prep. | Stud. supp. | Stud. rec. | Stud. encr. | Inter- actions | Colleg -iality | Prof. devel. | Conf. pres. | Fam. friend. | Phy. env. | Ben. | Cont. | Future |
|----------------|------------|---------|--------|-------------|-------------|------------|-------------|----------------|----------------|--------------|-------------|--------------|-----------|---------|---------|---------|
| Job satis. | — | .057 | .084** | .185** | .110** | .138** | .038 | .049 | .234** | .017 | .022 | -.366** | .425** | .473** | .622** | -.499** |
| Gender | | — | .073* | -.025 | .017 | -.033 | -.149** | -.037 | -.046 | -.132** | -.021 | -.067* | -.011 | .017 | -.052 | .021 |
| Age | | | — | -.127** | -.027 | -.078* | -.125** | -.023 | .089* | .067* | .009 | .027 | .097** | .094** | .055 | -.092** |
| Stud. prep. | | | | — | .123** | .100** | -.026 | -.059 | .148** | -.051 | -.104** | -.109** | .175** | .182** | .252** | -.170** |
| Stud. supp. | | | | | — | .088* | .166** | .027 | .150** | .021 | -.008 | -.105** | .122** | .169** | .126** | -.080* |
| Stud. rec. | | | | | | — | .344** | .074* | .098** | .067* | .055 | -.027 | .061 | .094** | .187** | -.019 |
| Stud. encr. | | | | | | | — | .191** | .205** | .077* | .142** | -.054 | .029 | .108** | .184** | -.030 |
| Inter- actions | | | | | | | | — | .090** | .091** | .085** | -.071* | .045 | .040 | .057 | .003 |
| Colleg- iality | | | | | | | | | — | .126** | .094** | -.110** | .202** | .215** | .348** | -.216** |
| Prof. devel. | | | | | | | | | | — | .110** | .005 | .002 | .119** | .124** | -.064* |
| Conf. prest. | | | | | | | | | | | — | -.068* | -.011 | .031 | .023 | -.002 |
| Fam. friend. | | | | | | | | | | | | — | -.222** | -.322** | -.292** | .300** |
| Phy. envi. | | | | | | | | | | | | | — | .452** | .356** | -.262** |
| Bene- fits | | | | | | | | | | | | | | — | .493** | -.382** |
| Cont. | | | | | | | | | | | | | | | — | -.545** |
| Future | | | | | | | | | | | | | | | | — |

* $p < 0.05$. ** $p < 0.01$.

APPENDIX F. STANDARDIZED COEFFICIENTS TABLES FOR FACULTY GROUPS

Table F.1. Standard Regression Coefficients for Predicting Job Satisfaction of SEM Faculty ($N = 153$)

| Variable blocks | Standard regression coefficients (beta) | | | | | |
|----------------------------|---|---------|---------|---------|---------|----------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Gender | .003 | .016 | .000 | .029 | .335 | 1.035 |
| Age | .024 | .076 | .062 | .032 | -.642 | -.999 |
| Student preparation | | .200* | .168 | .140 | .530 | -.302 |
| Student support | | .193* | .192* | .191* | 1.748 | 2.390* |
| Recruitment and retention | | | .065 | .052 | .528 | -.354 |
| Encouragement | | | -.122 | -.098 | -1.808 | -2.355* |
| Interactions with students | | | -.021 | -.044 | -.560 | .215 |
| Collegiality | | | | 2.000* | 1.402 | -.292 |
| Professional development | | | | 1.550 | 1.011 | -.168 |
| Conference presentation | | | | -.425 | -.277 | .645 |
| Family friendliness | | | | | -1.222 | -.291 |
| Physical environment | | | | | 2.896** | 1.969 |
| Benefits | | | | | 3.467** | 1.664 |
| Contentment | | | | | | 5.362*** |
| Future plans | | | | | | -2.067* |
| Adjusted R^2 | -.013 | .061** | .056* | .085* | .265*** | .461*** |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table F.2. Standard Regression Coefficients for Predicting Job Satisfaction of Non-SEM Faculty ($N = 245$)

| Variable blocks | Standard regression coefficients (beta) | | | | | |
|----------------------------|---|---------|---------|---------|---------|----------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Gender | -.038 | -.038 | -.019 | -.012 | .005 | .053 |
| Age | .109 | .119 | .133* | .102 | .026 | -.027 |
| Student preparation | | .045 | .030 | .022 | -.043 | -.064 |
| Student support | | .138 | .113 | .093 | .011 | -.031 |
| Recruitment and retention | | | .088 | .104 | .090 | .102 |
| Encouragement | | | .097 | .082 | .055 | -.006 |
| Interactions with students | | | .083 | .077 | .026 | .022 |
| Collegiality | | | | .174** | .086 | .010 |
| Professional development | | | | -.026 | -.074 | -.089 |
| Conference presentation | | | | -.039 | .005 | .023 |
| Family friendliness | | | | | -.146** | -.099* |
| Physical environment | | | | | .297*** | .259*** |
| Benefits | | | | | .287*** | .103 |
| Contentment | | | | | | .309*** |
| Future plans | | | | | | -.245*** |
| Adjusted R^2 | .003 | .018 | .038* | .056** | .330*** | .478*** |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table F.3. Standard Regression Coefficients for Predicting Job Satisfaction of Arts and Science Faculty
($N = 427$)

| Variable blocks | Standard regression coefficients (beta) | | | | | |
|----------------------------|---|---------|---------|---------|----------|----------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Gender | .010 | .009 | .014 | .028 | .029 | .071* |
| Age | .071 | .104* | .105* | .081 | .025 | -.025 |
| Student preparation | | .129* | .131* | .119* | .059 | .004 |
| Student support | | .166* | .165* | .153** | .061 | .043 |
| Recruitment and retention | | | .083 | .087 | .063 | .045 |
| Encouragement | | | -.026 | -.036 | -.055 | -.072 |
| Interactions with students | | | .073 | .062 | .023 | .016 |
| Collegiality | | | | .176*** | .113** | .021 |
| Professional development | | | | -.002 | -.045 | -.072* |
| Conference presentation | | | | .001 | .028 | .046 |
| Family friendliness | | | | | -.189*** | -.106** |
| Physical environment | | | | | .220*** | .172*** |
| Benefits | | | | | .294*** | .105* |
| Contentment | | | | | | .363*** |
| Future plans | | | | | | -.232*** |
| Adjusted R^2 | .001 | .044*** | .049*** | .073*** | .323*** | .506*** |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table F.4. Standard Regression Coefficients for Predicting Job Satisfaction of Career and Technical Faculty
($N = 439$)

| Variable blocks | Standard regression coefficients (beta) | | | | | |
|----------------------------|---|---------|---------|---------|----------|----------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Gender | .103* | .110* | .114* | .109* | .071 | .071 |
| Age | .096* | .111* | .137** | .117* | .058 | .057 |
| Student preparation | | .233*** | .225*** | .201*** | .078 | .039 |
| Student support | | .035 | .024 | .003 | -.068 | -.050 |
| Recruitment and retention | | | .131** | .112* | .080 | .048 |
| Encouragement | | | .027 | -.012 | -.030 | -.038 |
| Interactions with students | | | .050 | .048 | .027 | .046 |
| Collegiality | | | | .179*** | .078 | .022 |
| Professional development | | | | .008 | .018 | -.005 |
| Conference presentation | | | | .029 | -.012 | -.001 |
| Family friendliness | | | | | -.221*** | -.153*** |
| Physical environment | | | | | .219*** | .168*** |
| Benefits | | | | | .278*** | .149** |
| Contentment | | | | | | .257*** |
| Future plans | | | | | | -.215*** |
| Adjusted R^2 | .015* | .067*** | .084*** | .109*** | .359*** | .479*** |

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

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