

Mission possible: Skills 2010—A study of Kirkwood Community College's
employers' skills and education needs

by

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

DOCTOR OF PHILOSOPHY

Major: Education (Educational Leadership)

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2008

UMI Number: 3307062

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ABSTRACT

How do employers in a rural seven-county region in the middle of the United States compete in an international market? And how does the local community college help? These questions need to be answered on an ongoing basis in order for the region served by Kirkwood Community College in Cedar Rapids, Iowa to stay economically viable and for the College to fulfill its mission. The purpose of this dissertation was to conduct a research study to inform Kirkwood Community College, as well as appropriate economic development partners and the broader community, about education and skill needs of employers.

Questions guiding the research were: (a) What are the workforce needs of employers in Kirkwood Community College's seven-county service area? (b) Are employers' educational expectations changing for occupational positions? (c) What programs should Kirkwood Community College consider implementing in order to assist employers with their workforce needs? (d) How do employers engage young people in their workplaces to offer work-based learning opportunities? (e) What are the impediments to economic growth for employers competing in a national and international economy?

The quantitative study was conducted on the theoretical framework of multiple missions, participatory action research and collaborative inquiry theory concepts. The study used concurrent quantitative data procedures to fulfill the college's mission by obtaining employer projections in Kirkwood Community College's seven-county region regarding employment and occupational job needs. Also gathered was information about educational degrees desired, current training trends, and skill gaps. Surveys were distributed to employers within 12 strategically selected industry sectors to collect changing labor market data.

The results indicate a significant projected increase in new job growth and replacement of existing workers. Additionally, employers indicate concern related to missing skill profiles among job applicants and existing workers in the region. Area employers need an available, productive, and educated workforce as they compete on a regional, state, national, and international level.

The study demonstrates the need for program alignment with the employer community on a regional basis to provide opportunities for workers. It also provides a replicable model for other community colleges focused on workforce and economic development. Finally, the study contributes knowledge and research valuable for other community colleges as they fulfill their missions.

CHAPTER ONE

CONTEXT OF THE PROBLEM

Overview

How do employers in a rural seven-county region in the middle of the United States compete in an international market? And how does the local community college help? These questions need to be answered now and in the future in order for the region served by Kirkwood Community College to stay economically viable and for the college to fulfill its mission. This chapter describes past studies conducted by Kirkwood Community College to respond to the needs of area businesses. It articulates regional needs that led to the creation of the current study, which was informed by theoretical perspectives regarding the multiple missions of community colleges, participatory action research and collaborative inquiry. Research questions guiding the study are shared. The significance of the study for the wider community college audience is discussed. Important terms used in this document are defined, and delimitations and limitations are identified.

Statement of the Problem

In 1965, Iowa Governor Harold Hughes proposed a system of public community colleges whose mission would be to train people for jobs. From that first enabling legislation in 1965 (Senate File 550), the die was cast for a group of post-secondary colleges set in 15 strategic areas around the State of Iowa. The legislation indicated that these community colleges should be established to provide accessible education. They are governed by locally elected boards of trustees who are empowered with strong local control over the operation of the colleges. Iowa's community colleges are funded through state general aid, property taxes, and tuition revenue

sources. Iowa has a comprehensive community college system that provides two-year arts and sciences credit degree transfer programs; vocational-technical credit certificate, diploma and degree programs; Adult Basic Education, GED, and English as a Second Language programs; alternative high schools; high school career academies; continuing education; and customized training programs for business and industry. In many regions, Iowa's community colleges are core partners in the state's one-stop workforce development center system.

Kirkwood Community College, founded in 1966, is located in Cedar Rapids, Iowa. Kirkwood's mission approved by its Board of Trustees is to identify community needs; provide accessible, quality training and education; and promote opportunities for lifelong learning. The college has more than 15,000 credit students and serves more than 40,000 people in non-credit programs each year.

The Cedar Rapids/Iowa City Technology Corridor is a critical area of the region served by Kirkwood. The Technology Corridor has been defined and branded by Priority One, the economic development arm of the Cedar Rapids Area Chamber of Commerce and Iowa City Area Development Group, a private non-profit organization. The two organizations have branded the Technology Corridor name for marketing purposes for more than 15 years. Throughout this time Kirkwood Community College's president has held a seat on both economic development boards and been involved in advancing the economic development agenda in the region. This work has primarily been done by cultivating relationships with corporate companies which are likely to need a Midwestern presence. Kirkwood's president and economic development staff often are asked to participate in hosting dinners and tours of the campus and to go on trips to cultivate business prospect relationships.

The last 10 years have demonstrated interesting cycles, both positive and negative, in the local economy. In 1998, Kirkwood's business community was in a near workforce crisis due to unemployment rates falling below two percent and dropping each month (Cedar Rapids MSA Labor Force Summary Linn County). Employers were unable to find qualified workers and clearly needed assistance in new ways. The crisis created a critical debate among leadership at the college. As Executive Director of Continuing Education and Training Services at Kirkwood Community College, and as a new member of the senior leadership team, it was my role to help answer questions like: How could Kirkwood Community College help? Since Kirkwood's mission statement starts with "identify community needs," who was "the community" and how could the college help identify that community's needs? The anecdotal comments coming from business leaders were pointed and varied regarding their workforce needs. Based on the need for accurate data, several research projects were undertaken, including this dissertation.

Grubb, Badway, Bell, Bragg, and Russman (1997) posited that community colleges have found themselves responding to new opportunities and needs of the community, thus entering new arenas such as economic development, workforce development, and community development. Programs and services have been expanded to serve multiple missions. Indeed, in 1998 it was clear that Kirkwood Community College needed to play a leadership role in responding to the needs of the community.

The college initiated a study of area businesses and their projected needs for employment and skills through an advisory board called the Skills 2000 Commission. This group of area business and education leaders was enlisted to lead a small survey of employment needs of 33 major East Central Iowa companies.

The study, resulting in the Skills 2000 Report (Skills 2000 Commission 1998), provided an impetus for 13 new workforce training programs offered by Kirkwood and a new training program investment by the State of Iowa legislature in 1999 called Accelerated Career Education (Senate File 465). This innovative program assists Iowa's community colleges in establishing and expanding programs that train individuals in occupations most needed by Iowa businesses. Since its inception, \$37 million has been authorized for ACE program operational support (state income tax withholding diversions) and \$45.4 million in ACE infrastructure to community colleges for the creation or expansion of high-wage, high-skill technical degree education programs (Department of Economic Development Annual Workforce Training Report 2007).

In the summer of 2003, Kirkwood initiated another similar study. However, the economic conditions were very different from 1998. For two years the region had experienced significant downsizings in the manufacturing and telecommunication industries, due to an economic downturn following the national events of September 11, 2001 (Lederhandler 2001). The Cedar Rapids/Iowa City Technology Corridor committee, of which Kirkwood is a member, sponsored the study. The committee was made up of representatives from chambers of commerce, economic development groups, utilities, higher education, and government. Employers who participated in the study projected their workforce needs through 2006.

A total of 250 companies were identified, using 10 industry sectors for the research project which were selected by the economic development partners. The sectors included: advanced manufacturing, agriculture/biotechnology, educational services, financial services/software, food/health and beauty products, government, health care, plastics/packaging, printing, and a catch-all category for miscellaneous companies. More than 150 companies

participated that are located throughout Kirkwood Community College's seven-county service area.

The results of the study, called the Skills 2006 Report (The Cedar Rapids/Iowa City Technology Corridor Committee 2003), led to five recommendations from the sponsoring committee for improving workforce and economic development programs for the region. The recommendations were: (a) Businesses need to require assessments and/or certifications for hiring in the areas of essential and technical skills in order to impact significant change. Educational institutions should look for opportunities to incorporate these needs into their graduation requirements and adapt curriculum accordingly. (b) In order for the region to stay economically viable, businesses also need to continue to invest in essential and technical skill training for their existing workers. (c) Efforts should be implemented to improve retention of area high school and college graduates. Business and education need to place more priority on work-based learning experiences for area high school and college students. (d) Because companies identified a lack of diversity among their employees and applicants, additional efforts should be made to improve the number of women and minorities particularly in technical program areas. (e) In order to continue to attract qualified applicants and retain existing workers, quality of life issues must continue to be addressed.

The Skills 2006 Report, released in October 2003, was used to influence the Iowa Legislature's response to a weakening economy by establishing an economic stimulus package called the Grow Iowa Values Fund. This fund was passed in 2005 through House File 868 (the policy provisions) and House File 809, sections 18 and 19 (the funding provisions) that put the ten year, \$50 million per year general fund appropriation in place. The distribution provision allocates \$7 million each year to Iowa's Community Colleges.

In the region served by Kirkwood Community College, a lack of current data existed again in 2007 regarding area employment projections, occupational positions, and educational needs for those positions. Moreover, data was not available regarding training and skill needs, a problematic issue for educational institutions (Carnevale & Descrochers, 2001).

Iowa Workforce Development, the state's workforce development agency, provided employment projections for 10 years, including the fastest growing occupations, on its web site (Occupational Projections 2004-2014). While this information was beneficial for some employers and educational institutions projecting long-term needs, it did not provide the in-depth, region-specific information needed for Kirkwood Community College and other community partners to develop specific education and workforce development solutions.

Purpose of the Study

The employers in the region are conducting business in a global economy. At the same time, citizens in the region need education and training programs that allow them to stay competitive in the workforce or gain employment, according to the National Center on Education and the Economy (2007). In order to align education and training programs with the needs of employers for Kirkwood's service area, an in-depth regional study was once again needed. The study would also allow the college to focus on its mission to identify the needs of stakeholders and to provide critical learning solutions in order to help the region to stay economically strong.

Kirkwood Community College's mission as revealed on its web site (Kirkwood at a Glance) is to *identify community needs, provide accessible quality training and education, and promote opportunities for lifelong learning*. The vision is to *invent, develop, and deliver learning solutions for the 21st*. The purpose of this dissertation was to advance the college's mission and vision by conducting a research study to inform the board of trustees and college administration

in relationship to its focus on the college's vision and mission. Additionally, the study provides relevant information to the college to direct its work with appropriate economic development partners and the broader community, about education and skill needs of area employers.

Theoretical Perspectives

The evolution of comprehensive community colleges is rooted in the theory of community colleges' multiple mission functions. Grubb et. al (1997) relay the concept of the "regular college" offering traditional two-year transfer and terminal occupational degree programs, which are now joined by the three relatively new roles of workforce, economic, and community development. They suggest an emphasis on an entrepreneurial community college environment with colleges focused on these new roles.

Bailey and Morest (2004) suggest a multiple mission's theory rooted in the concept of comprehensiveness, a term established in 1947 when President Truman's Commission on Higher Education focused attention on colleges attempting to meet the post-secondary needs of the community. This focus has allowed community colleges to grow by serving a variety of constituents, thus adopting multiple missions.

Three major missions identified in this theoretical framework include the core, vertical and horizontal with each of the three missions centering on curriculum but serving a unique audience of the community college, according to Bailey and Morest (2004). The core mission focuses on traditional two-year transfer or terminal occupational degree programs and also includes remedial and development education. The vertical mission involves traditional-age college students that are "pushed or pulled" through the traditional system. The horizontal mission involves outreach to the community through diversification of education and services.

This mission most closely identifies and aligns with the current environment and culture found at Kirkwood Community College.

Participatory and pragmatic knowledge claim position theories (Checkland & Holwell, 1998) will also be used to collect timely and relevant labor market data in order to advance the college's mission and vision. Participatory action research has emerged in recent years as a significant methodology for intervention, development, and change within communities and groups. Participatory action research has roots in social psychology and builds on the action research and group dynamics model developed by psychologist Kurt Lewin in the early-to-mid 1900s among others (Checkland & Holwell, 1998). At its core, participatory action research revolves around three sets of relationships: between individuals within communities and groups, between those groups and communities, and between people and their physical environment.

This research is a recognized form of experimental research that focuses on the effects of the researcher's direct actions of practice within a participatory community, with the goal of improving the performance quality of the community or an area of concern (Reason & Bradbury, 2001; Hult & Lennung, 1980). A collaborative method to test new ideas and implement action for change, it involves direct participation in a dynamic research process, while monitoring and evaluating the effects of the researcher's actions with the aim of improving practice (Checkland & Holwell, 1998; Hult & Lennung, 1980). At its core, action research is a way to increase understanding of how change in one's actions or practices can mutually benefit a community of practitioners (Reason & Bradbury, 2001).

Participatory action research proceeds through continuous, repeated cycles, in which researchers and the community start with the identification of major issues, concerns and problems. They then initiate research, originate action, learn about this action, and proceed to a

new research and action cycle. Participants in action research projects continuously reflect on their learning from the actions and proceed to initiate new actions on the spot. Outcomes are very difficult to predict from the outset, challenges are sizeable, and achievements depend to a very large extent on researcher's commitment, creativity, and imagination (Checkland & Holwell, 1998; Hult & Lennung, 1980).

The study was further informed by collaborative inquiry concepts. John Heron (1996) first proposed collaborative inquiry in 1971; his work was later expanded by Reason and Bradbury (2001). The major idea of collaborative inquiry is to research "with" rather than "on" people. All active participants are fully involved in research decisions as co-researchers. Collaborative inquiry creates a research cycle among four different types of knowledge: propositional knowing (as in contemporary science), practical knowing (the knowledge that comes with actually doing what you propose), experiential knowing (the feedback we get in real time about our interaction with the larger world) and presentational knowing (the artistic rehearsal process through which we craft new practices). The research process iterates these four stages at each cycle, with deepening experience and knowledge of the initial proposition, or of new propositions, at every cycle. A collaborative method is used to test new ideas and implement action for change. It involves direct participation in a dynamic research process, while monitoring and evaluating the effects of the researcher's actions with the aim of improving practice (Checkland & Holwell, 1998; Hult & Lennung, 1980).

The Skills 2010 study used pragmatic knowledge claims incorporating quantitative methods with employers and community leaders. The study identified needs of the employer community through an extensive and concurrent survey and interview process. While the two prior surveys conducted by Kirkwood Community College used cross-sectional approaches, the

Skills 2010 replicated the Skills 2006 survey, allowing for a longitudinal review. Deploying these methods allowed for a more in-depth and detailed understanding of the issues with a clear goal at the end to advance an action agenda for the region regarding workforce development strategies which is outlined in the last chapter.

Research Questions

The research study questions guiding the study were: (a) What are the workforce needs of employers in Kirkwood Community College's seven-county service area in 2010? (b) Are educational expectations changing by employers for occupational positions? (c) What programs should Kirkwood Community College consider implementing in order to assist employers with their workforce needs? (d) How do employers engage young people in their workplaces to offer work-based learning opportunities? (e) What are the impediments to economic growth for employers competing in a national and international economy?

The first part of the research process included the distribution of a survey instrument by mail to the purposefully selected sample of employers in 12 industry sectors (listed earlier) to collect occupational projections and educational levels desired. Face-to-face interviews and phone interviews were then conducted concurrently to gather data related to skill gaps, internship opportunities, new program considerations, and impediments to business growth. The employment and educational projections were reported by occupational categories, industry sectors, and educational levels. Skill gaps, internship programs, new programs needed, and business growth concerns by the study participants were coded for frequency and themes.

The research questions for the study provided direction to determine job and occupational growth patterns along with educational levels and skill needs. Additionally, the data informed college administrators regarding new program development for Kirkwood Community College

as well as provided important insights on growth impediments for the region. Simultaneously, the study results also continue to inform and shape future community, economic, and workforce development action plans.

Significance of the Study

The Skills 2010 contributes to literature and research by providing a clear example of how a community college fulfills part of its mission by identifying needs of employers. The study results will add to existing knowledge related to comprehensive community colleges working to fulfill multiple missions and competing in a global economy (Grubb et. al, 1997). The Skills 2010 research project improves practice in the field by providing a replicable study opportunity for other community colleges.

The previous Skills 2000 and 2006 studies engaged Kirkwood Community College and its economic development partners in understanding future hiring needs by occupation levels, educational levels, and skill sets. These studies both proved to be an effective exercise of asking, listening, and—the ultimate test—responding. The data collected, along with the final analysis report, positioned Kirkwood as a responsive, flexible provider of a critical solution for workforce and economic development in the region. These studies, now joined by the Skills 2010 study, provide a practical and realistic way to start the process of serving the employer community and thus serving the role of a responsive education provider to the community as called for by Harman and MacAllum (2003).

The Skills 2000 and Skills 2006 reports heavily influenced new opportunities for funding new and existing programs, as noted earlier by legislative action of the Accelerated Career Education Fund and the Grow Iowa Values Funds. The Skills 2010 study will also improve public policy decisions by providing relevant, factual data to policymakers to better align policy

to employer need. The study results provide a catalyst for community leaders to determine appropriate action plans which will impact local community policy.

Definition of Terms

Kirkwood Community College is a nationally accredited community college located in Cedar Rapids, Iowa. Founded in 1965, it serves more than 15,000 credit and 40,000 non-credit students a year. Credit programs are defined as sequential classes offered leading to a degree or diploma. Non-credit programs are classes offered in a variety of subject and program areas which do not lead to a formal degree or diploma but may award Continuing Education Units (CEUs) based on seat time in the classroom.

The Skills 2000 and Skills 2006 Reports were studies of area employers' employment and skill needs conducted by Kirkwood Community College. These studies were conducted in partnership with Priority One and Iowa City Area Development Group, both economic development agencies located in the two largest counties in Kirkwood's seven-county service area. Skills 2000 was conducted in 1998 and Skills 2006 in 2003. The Technology Corridor is a title branded by the two economic development organizations to market the region to business prospects.

Iowa Workforce Development is Iowa's employment securities agency. The State of Iowa agency contributes to Iowa's economic growth by providing quality customer-driven services that support prosperity, productivity, health, and safety for Iowans. In conjunction with state and local economic development efforts, Iowa Workforce Development also assists businesses in fulfilling their workforce needs.

The Iowa Legislature is a legislative body elected by local constituents to establish policy and law for the State of Iowa. The legislative authority is vested in a general assembly, which

consists of a senate and house of representatives. The General Assembly of Iowa created two major programs in response to economic and workforce development needs. Called Accelerated Career Education (ACE) and Grow Iowa Values Funds (GIVF), these programs are administered by the Iowa Department of Economic Development.

The Iowa Department of Economic Development is a state agency focused on economic development in the state. The vision of this department is for all Iowans to enjoy a vibrant economy. The department's mission is to engender and promote economic development policies and practices which stimulate and sustain Iowa's economic growth and climate and integrate efforts across public and private sectors. The Iowa Department of Economic Development (IDED) commissioned the Battelle Memorial Institute's Technology Partnership Practice to outline strategies for enhancing Iowa's biotechnology, advanced manufacturing, and information technology sectors, using input from industry and government leaders from across the state. The reports create a roadmap for action-oriented programs and new initiatives organized around the key comparative advantages and emerging industries of Iowa.

The Accelerated Career Education (ACE) program is designed to provide Iowa businesses with an enhanced skilled workforce. This innovative program assists Iowa's community colleges in either establishing or expanding programs that train individuals in the occupations most needed by Iowa businesses. The program consists of two different parts: (1) ACE dollars to fund the necessary infrastructure construction and rehabilitation needed to increase student capacity in the new or expanded classes, and (2) program job credits that help fund the additional program costs associated with establishing a new or expanding a current program. To participate in ACE, businesses enter into an agreement with a community college to sponsor a portion or all of the positions created by the establishment or expansion of a current

educational program. By sponsoring open positions in a program, a company agrees to consider the student for employment upon the completion of his/her respective training program.

Businesses must assist with program design and provide a 20% match of the program costs, prorated by the percentage of positions sponsored.

The Grow Iowa Values Fund (GIVF) is the state's premier 10-year economic development program designed to transform Iowa's economy by creating high quality jobs through business development and expansion across Iowa. With a \$50 million dollar appropriation for business development and marketing, the GIVF assists Iowa companies to expand as well as attract new businesses to the state.

The 2000 Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of over 820 occupations according to their occupational definition. To facilitate classification, occupations are combined to form 23 major groups, 96 minor groups, and 449 broad occupations. Each broad occupation includes detailed occupation(s) requiring similar job duties, skills, education, or experience.

Delimitations and Limitations

Kirkwood Community College is a rural community college located in Cedar Rapids, Iowa which serves seven counties: Benton, Cedar, Iowa, Johnson, Jones, Linn, and Washington. The study's focus was delimited to selected employers within Kirkwood Community College's service region. Employers were the only unit of analysis for this study. The study did not include information from economic development or chamber of commerce partners, educational institutions, or individuals employed or seeking employment.

The study was a replication of a previous study conducted in 2003. The study was delimited to 12 industry sectors, 10 of which were used in the Skills 2006 study. The industry sectors represent seven sectors which the economic development organizations are committed to strategically growing in the region through significant human and financial resources. Four additional sectors—education, government, health care, and trades—were used because they represent high levels of employment in the region. “Other” was the final category provided.

The occupational classifications for this study were derived by using the Standard Occupational Classifications listing by the United States Department of Labor, Bureau of Labor Statistics. The list used for the study was derived from the 23 major Standard Occupational Classifications (SOC) (see Appendix F). The list was delimited to only those occupational classifications that are related to the industry sectors in the region. This was necessary in order for the employers to determine whether the time involved in participating in the survey was reasonable for their needs.

The study was limited to a small sample size of employers among seven counties in a rural area in the State of Iowa. The educational projections requested did not elicit specific details within a program area. Overall, the results were specific to the employer’s perceived needs and did not include employees or individuals seeking employment with the employer. The study was conducted in the fourth quarter of the year and was also limited to a three-year projected time frame.

Summary

A community college that focuses on its mission and vision can be a critical leader among its key stakeholders. Kirkwood Community College’s history is rooted in understanding and upholding its mission, vision, and values. As part of this success, the college has understood

and embraced the multiple stakeholders served by the college. One such critical stakeholder is the employer community. As an innovative community college, Kirkwood Community College has embraced the employer community through such specific programs and services as contracted training and outreach assistance for the last twenty years. In 1998 and 2003, in collaboration with its economic development partners, Kirkwood conducted studies specifically focused on employment and skill needs of employers in the region.

The Iowa legislature responded to the previous studies in Kirkwood Community College's seven-county region with the adoption of the Accelerated Career Education Fund and the Grow Iowa Values Fund. The Skills 2000 Report, along with community college lobbying efforts, established the Accelerated Career Education (ACE) program in 1999.

Kirkwood Community College, along with its economic development partners, anticipates that the Skills 2010 report, like the Skills 2000 and Skills 2006 reports, will serve as an important study to inform future innovative educational programs in the Cedar Rapids/Iowa City corridor. The study effort indicates Kirkwood Community College's leadership is committed to the market-responsive mission of the college by allocating resources to conduct the study and reaching out to local employers (Harmon & MacAllum, 2003).

This chapter described the theory of community colleges' multiple missions functions, which provide the foundation for the 2010 Study. Research questions were also identified and the significance of the study for both Kirkwood Community College's region and the wider community college audience were discussed. Essential terms were defined and delimitations and limitations given.

Chapter Two presents a literature review map that shows the major categories and subcategories researched in preparation for the design of the Skills 2010 study. The two major

categories are “employers competing in a global economy” and “the multiple missions of community colleges.” Subcategories of “employers competing in a global economy” include labor shortage projections, job requirements, and employers’ perspectives. Subcategories of “the multiple missions of community colleges” include aligning education and the knowledge economy, community colleges in the knowledge economy, and employer workforce studies led by higher education. This chapter reviews the literature in each of these areas of research.

Chapter Three outlines the design of the research project, including both the quantitative and qualitative components. Telephone and face-to-face interviews were deployed to gather the data regarding workforce and education projections from selected employers in the region. Purposeful sampling was used, with the employer the only unit of analysis. The population of the study was the regional employer community. The sample population included 286 employers representing small, medium, and large types of organizations from twelve industry sectors.

Chapter Four provides the results of the study. The results are categorized by tables based on the data provided by the employers. Information is provided regarding employment projections by industry sector and occupational classifications, as well as education level projections. Additionally, results of the study are provided regarding skill profile concerns of applicant pools and incumbent workers. Information regarding training investments and products is outlined, as is use of internships and work-based learning programs. Employers’ insights are shared regarding workforce impediments to their business growth as well as all other workforce issues. Major findings from the data results are discussed, as are trends to be considered in the future.

Finally, Chapter Five provides a summary and discussion from the data findings and study results. Recommendations for further study are provided, based on the outcomes and

findings of the research project. Also shared are suggestions for how the study could be replicated and used as a model for other community colleges in the United States as they embrace their multiple missions.

CHAPTER TWO

A REVIEW OF THE LITERATURE

Overview

This chapter reviews literature emphasizing the international scope and nature of an impending workforce and economic development concern. Many sources suggest that in this international global economy, the multiple missions of community colleges of focusing on employers and students to better align the needs of their local communities and region has never been more critical (Harmon & MacAllum, 2003; Carnevele & Descrochers, 2001; Grubb et. al., 1997; Bailey & Morest, 2004). Attention is given to the competitiveness of the United States economy in an international market, occupational and employment projections, and the education and skill needs of current and future jobs. It also provides an understanding of the labor shortages facing the nation and more specifically the State of Iowa, where the shortages have the greatest impact on employers. Other employer perspectives are provided, as well. The chapter also provides an understanding of the needs for alignment of education with the needs of employers and employees alike, working and living in the knowledge economy. Finally, the chapter articulates the multiple missions of community colleges, including their role in the knowledge economy.

Organizing the Issue

The 2010 Study was informed by theory and research from a variety of disciplines. In order to identify and understand workforce issues, a thorough review of the literature was conducted. The review process also informed the research design and theoretical framework for the project. As the literature review was reviewed, analyzed and measured, major themes

emerged to structure the overarching issues which, in turn, shaped the research questions and the theoretical framework for the study. A literature review map categorized and captured the major themes for the purpose of organizing the literature as well as to inform the research design and data collection process. The results of the research project had greater meaning when considered in the context of state, national and international trends and data. Figure 1 provides a visual representation of the how the literature was organized for the purposes of the study.

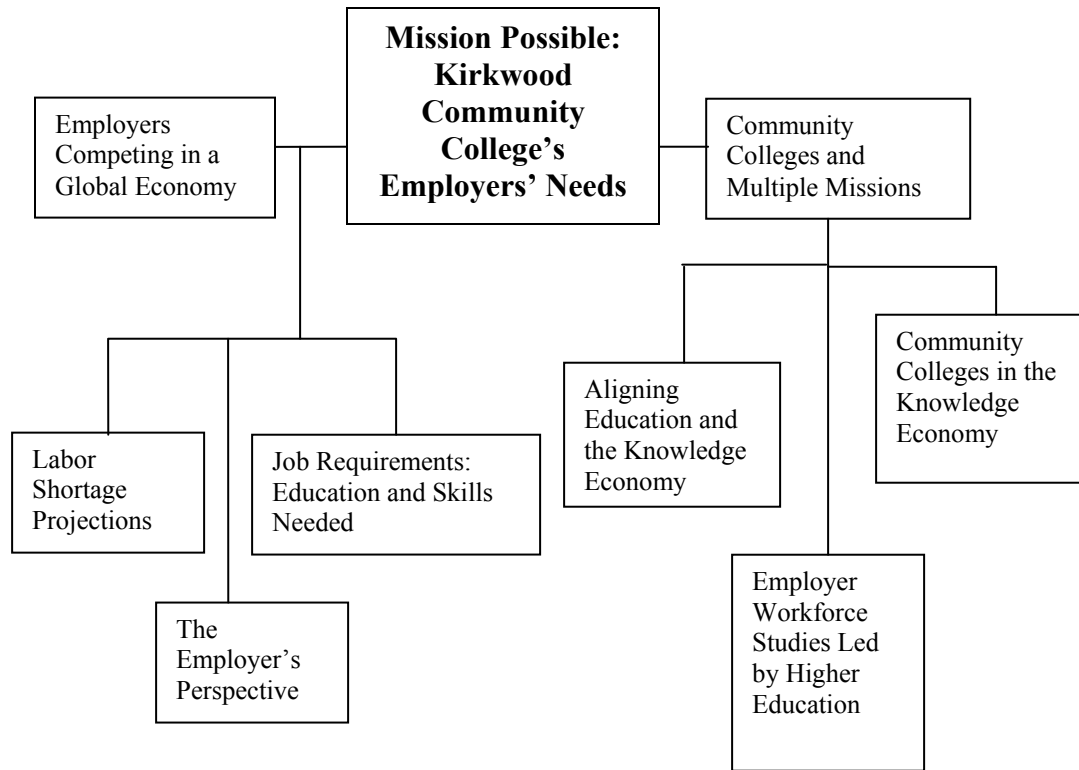


Figure 1. A visual representation of the literature review map used for the study.

The starting point of the literature review map was determined by Kirkwood Community College's goal to fulfill its mission by identifying workforce needs of employers within its respective services area. In order to understand the issue on a regional scale, a larger perspective was needed regarding the changing nature of the local, state, national, and international economy. Moreover, what and who are the influencers impacting the change? The categories were broken into two major divisions: (a) employers competing in a global economy and (b) community colleges and their multiple missions. Factors influencing employers included labor shortages, changing job requirement expectations, and employers' perspectives of the supply of workers. On the side of community colleges and multiple missions, a review of literature included alignment of education programs and the knowledge economy, the role of community colleges in the knowledge economy, and other studies conducted by higher education of employer's workforce needs.

Competing in a Global Economy

Businesses and industries in the United States have a difficult challenge ahead. According to Herman's report *Futurework* (1999), increased global competition will continue to affect the type of work being done in American workplaces, creating new high-skilled jobs and lessening demand for low-skilled work. The impact will continue to grow as more of the economy is involved in producing exports or competing with imports. Contributing factors to economic expansion internationally include new technologies, increased trade, multinational brands and companies, and international finance. While the Internet and other new technologies have created a more open market for promoting products and services, the same international market, open for all to explore, is also creating new workforce challenges.

Consequently, many reports in the last 25 years have explored new workforce challenges facing United States employers competing in a global economy. *A Nation at Risk* (1983), by the National Commission on Excellence in Education, considered the quality of education overall. Specifically, the Commission's charge was to focus on quality of teaching and learning in K-12 and higher education, comparing United States schools and colleges with other advanced nations along with various issues related to student achievement outcomes. The report suggested that if the education system did not recognize the importance of change and alignment to commerce and industry, the negative results would impact the intellectual and moral strengths of the American people. The report also reinforces the concept that knowledge, learning, and skilled intelligence are the new raw materials of international commerce.

Americas Choice: High Skills or Low Wages (1990) and the follow up report, *Tough Choices or Tough Times* (2007), both released by the National Center on Education and The Economy, articulate the gap of education and skills needed by United States companies versus those obtained by United States employees. The gap is due to advancements of technology; however, a critical dynamic is responding to rapid workplace change in relationship to the number of American-educated workers to fill current and future workforce needs.

The 2007 report confirmed what the 1990 report projected as a threat to the United States: those lower-skilled positions would migrate to other countries where pay was lower. In addition, the 2007 report states that 30 years ago the United States could lay claim to having 30% of the world's population of college students, while today the number is 14% and continuing to decline. Both reports suggest that the ability of the United States to compete economically is threatened because of these two primary factors.

However, a more recent phenomenon is occurring, according to *The Jobs Revolution* (2004). Authors Gunderson, Jones, and Scanland project a new paradigm in which skilled, white-collar jobs are shifting to other countries with lower paying wages such as China and India. This new paradigm accelerates the need for education and industry to improve the education levels of Americans so that the United States can remain competitive in a world economy.

A recent report, *Grow Faster Together; Or Slowly Apart* (2003) by the Aspen Institute, highlights three economic challenges which threaten the United States' ability to compete in an international economy. First is the worker gap, due to an aging native-born population. Second is the skills gap, due to slowing educational gains, and the third is the wage gap in earnings between those at the bottom and those at the top. *Bridging the Skills Gap* (2006), a report by American Society for Training & Development, also suggests that knowledge is the new currency of success in the American economy. If workforce shortages are ignored and if workers' skills become obsolete, negative consequences will be felt by states and regions alike.

Labor Shortage Projections

According to the latest projections of the Bureau of Labor Statistics, total employment projections from 2000-2010 will increase by 22.2 million jobs (Hecker 2001). This increase represents growth of about one million more than the previous decade. On the surface, this represents good news for the United States, but there may not be enough workers to fill these positions because 35.8 million replacement positions are also estimated, due to normal attrition in the workforce such as turnover and retirement plans. Of the total positions projected through new job growth and replacement positions, all occupational areas will require more training and education than in 2000. The Aspen Institute (2003) predicts that while there will be growth in new positions, there will be a worker shortage in the United States. From 1980 to 2000, 26.7

million new native born workers age 25-54 entered the workforce. However, from 2000-2021 the number of native-born workers in this age group will not increase.

Gunderson, Jones, and Scanland (2004) refer to the Bureau of Labor Statistics' prediction that in the year 2030, 41 million workers will enter the workforce; however, an alarming 76 million workers will enter retirement. The shortage gap starts to spread in 2010 and widens dramatically over a 20-year period. If this projection materializes over the next 20 years, all education communities must understand and be responsive to the skills and education needed for future job requirements.

On a statewide basis, the Iowa Workforce Development (2007) offers a report with industry projections for the state and regions every two years using a formula based on input from the Bureau of Labor Statistics' national long-term projections and indicator data. The projections from 2004-2014, using 25 industry codes, are that the Iowa economy will add more than 216,000 new jobs. This is a growth rate of 13.6 % for the 10 years used in the projection, with the two largest occupational categories expected to be in professional and services occupations. Another key finding in the report is that 54% of all occupations in the state require post-secondary education or higher.

Additionally, the report indicates the state's labor force, total employment, and nonfarm employment reached record levels in 2006. The state's unemployment rate for 2006 was 3.7%, well below the national rate and 15th lowest overall. In the nonfarm category, 1,502,500 people were working in this state in 2006, with growth occurring in most sectors. However, 239,424 workers in the state are age 55 and older, which represents almost 17% of the overall workforce.

The report describes the economic downturn in the state of Iowa in 2001, when an economic recession occurred with little or no recovery made until mid-2003. The greatest

recovery in job growth in the nonfarm category began in 2005 and continued into 2006. The report identifies that Iowa is primarily comprised of small businesses, with 94.3% of all firms employing less than 50 workers. The top industry in the state is manufacturing, with over 230,000 workers.

A chapter in the report highlights the use of industry clustering analyses to better understand economic regions. (“Industry cluster” is defined as a group of interrelated businesses in a relatively small area.) The report references the Iowa Department of Economic Development’s report (2007) by commissioning the Battelle Technology Institute to help them identify three key industry clusters: bioscience, information technology, and advanced manufacturing.

Overall, the state’s report mirrors the issues and concerns identified in many of the national reports and job projection statistics. The State of Iowa is projected to see job growth in the next seven years in occupational categories where over 50% require higher levels of education, at a time when a significant number of workers are close to retirement age.

Job Requirements—Education and Skills Needed

A national report by The Secretary’s Commission of Achieving Necessary Skills (SCANS, 1991) has been the foundation for much discussion and debate regarding K-12 curriculum preparation in the country. The Secretary of Labor appointed a commission in 1990 to determine the skills our young people need to succeed in the world of work.

The commission’s fundamental purpose was to encourage a high-performance economy characterized by high-skill, high-wage employment. The Commission was asked to examine the demands of the workplace and whether today’s young people are capable of meeting those demands. Specifically, the Commission was directed to advise the Secretary on the level of skills

required to enter employment. In carrying out this charge, the Commission was asked to define the skills needed for employment, propose acceptable levels of proficiency, suggest effective ways to assess proficiency, and develop a dissemination strategy for the nation's schools, businesses, and homes.

The SCANS Report is divided into two categories: (a) Foundation Skills and (b) Competencies. Foundation Skills consist of three components: basic skills, thinking skills, and personal qualities. The SCANS Competencies are composed of five components: resources, interpersonal skills, information, systems, and technology. The report results from the Commission's discussions and meetings with business owners, public employers, unions, and workers and supervisors in shops, plants, and stores. It builds on the work of six special panels established by the Commission to examine all manner of jobs from manufacturing to government employment. Researchers were also commissioned to conduct lengthy interviews with workers in a wide range of jobs.

A number of national reports support a trend that current jobs and future jobs will require more training and education than in the past. Barton (2000), analyzing literacy, education, and training needs from 1940-2006, asserts that in the last 10 years, the level of training and education needed by employers shows an increase in higher requirements for most all positions studied.

The Employer's Perspective

The discussion points are clear in this debate. One, the large population of baby boomers will begin retiring in large numbers over the next 20 years and the number of replacement workers is less than will be needed by employers. Two, United States businesses are competing in a global economy with other nations experiencing dramatic economic and workforce growth,

thus creating a new level of competition for U.S. businesses. Three, the level of education and skills of workers needed by business and industry has increased.

A report by The Conference Board (2006) shares employers' perspectives on basic knowledge and applied skills needed of new workers. Employers are concerned that high school and college graduates' abilities are adequate, rather than excellent. Education and business must come to an agreement that applied skills are integrated with core academic courses to create an educational system that truly prepares workers for the 21st century. The report suggests businesses need to initiate stronger partnerships with education in order to impact necessary change.

Another report underscores the economic reality of a highly educated and trained workforce by measuring productivity of workers. In a quantitative research study conducted by Black and Lynch (1996), the impact of human-capital investments on productivity is estimated. A national survey, conducted with 3,358 employers (more than any previous study), found human capital (employees) is an important determinant of the employer's productivity. The study confirmed that the average educational level of the employer's employees had a positive and significant effect on the employer's business results. The report further defines results by manufacturing and non-manufacturing industry sectors and specifically which training programs improved productivity.

A review of the literature shows that employers clearly understand and have documented the advantage of a skilled and educated workforce in order to improve their bottom line results in an increasingly competitive global environment. Higher levels of awareness between education and business will ensure better alignment between the two.

Community Colleges & Multiple Missions

Community colleges are uniquely positioned to respond to the needs of employers and future employees alike. The mission of community colleges has evolved beyond their traditional roles of providing open access, vocational education, and an option for transfer to a four-year institution. Workforce training is now part of the mission. According to the literature, community colleges that embrace this new mission seek to meet rapidly changing local workforce development needs. Harmon and MacAllum (2003) indicate that there are four key ingredients to successful efforts. First, leadership is committed to the market-responsive mission of the college. Second, internal response mechanisms allow for rapid development of training curriculum to meet changing workforce demands. Third, partnerships are created with local businesses and workforce and educational organizations to develop appropriate training and academic curricula. The fourth ingredient is close ties with local communities. The report suggests that when community college leadership embraces this philosophy, it should be college-wide, encompassing credit and non-credit programs.

For a community college to be labor market responsive, it must actively consider the local and national economic environment and be able to deliver educational and training programs that directly address labor market needs, often in a very short time. Community colleges are well suited to assume this role, as they generally are nimble at curricula development, particularly with respect to non-credit programs. Community college administrators are beginning to transform the processes of delivering educational and training programs, allowing colleges to respond more quickly to labor market changes. Partnerships with employers and community organizations, a mission statement giving a high priority to workforce

development, and specialized contract training are all part of responding to workforce development needs.

Grub et. al (1997) pose the concept of the entrepreneurial colleges based on their study of seven community colleges. They suggest that non-credit programs at community colleges have been perceived as “shadow colleges” to the “regular college” offering traditional credit, degree granting programs. With the model of the entrepreneurial college, non-credit programs of community colleges focus on three main areas: workforce development, economic development, and community development. As these new roles have emerged in the community colleges, so have new students, new clients, new revenues, new visibility, and added credibility for the college.

Bailey and Morest (2004) explore the organizational efficiencies of multiple missions. They note that the concept of comprehensiveness was introduced and encouraged by the Truman Commission in 1947, in order to attempt to meet the post-secondary needs of communities. Community colleges that are mission-based and focus on meeting the needs of their communities are naturally going to evolve in meeting various constituent needs. After studying eight community colleges, the authors identify activities beyond the traditional degree granting programs that lead to transfer or terminal occupational degrees. The list includes training for welfare recipients and business and industry, non-credit programs for professional and personal development, developmental education, adult basic education, English as a second language, workforce research, and small business and entrepreneurial development.

Bailey and Morest (2004) identify the debate and tensions regarding the expansion of comprehensive community college missions but also further define the organizational structure by which community colleges form based on comprehensive missions. The study promotes a

modified typology of three categories, derived from an original typology of five that were developed by Patricia Cross (1985). The three categories are core, vertical, and horizontal. The horizontal category expands the college's efforts by reaching out to the community through diversification of education and services. This mission embraces the concept of multiple missions and most closely identifies and aligns with the current environment and culture at Kirkwood Community College.

Turning to the internal community college environment, research reveals higher satisfaction levels of community college administrators when multiple missions are employed. Arney and VanDerLinden (2002) found that administrators want academic transfer, workforce preparation, and lifelong learning to remain the mission of the community colleges. Moreover, administrators promoted and lobbied for a more comprehensive mission based on changing constituent needs. The authors note that linkages with business and industry, as well as internal new program delivery systems, are critical to the future success of an institution.

Another factor influencing the growth of multiple missions is the increased competition and threat of outside training and education providers (Carnevale & Desrochers, 2001). Community colleges may have a difficult time trying to offer a multitude of programs when competing with alternative training and education providers. However, the authors suggest that community colleges able to harness the synergies of multiple programs and offer them to constituents in a seamless educational package will have an advantage over the competition.

Aligning Education and the Knowledge Economy

Gunderson, Jones, and Scanland (2004) suggest that the challenge to higher education is relevance. Formal training and education programs are increasingly being established within an employer's organizational structure to invest in skill development of their employees. The

“corporate universities” have grown exponentially: 2,000 in comparison with 3,600 accredited colleges and universities.

The Business-Higher Education Forum argues in *Spanning the Chasm: A Blueprint for Action* (1999) that business and education need to work together to improve lines of communication. Collaboration and cooperation between business and industry and higher education must increase in order for workers to be prepared to meet the challenges of the global economy. A key point in the report is that both businesses and workers are competing in this changing market.

The report’s recommendations focus on what can be done to ensure students acquire the skills and attributes necessary to succeed in a high-performance workplace and what role higher education and industry play in helping students develop these skills. American companies reported that many college graduates were lacking in nine key attributes necessary for today’s jobs: leadership, teamwork, problem solving, time management, self-management, adaptability, analytical thinking, global consciousness, and basic communication skills, including listening, speaking, reading, and writing. For the United States to become a nation of learners, students need to be trained to work with others, assess complex situations, and solve problems in a response to an unpredictable market.

Furthermore, the report predicts what is at stake if the United States puts off the challenge. The difficulty of finding and retaining skills workers will be magnified with impending retirements of the “Baby Boomers” generation in the next 20 years. Businesses will seek workers where they can find them; if qualified workers are not available in the United States, then businesses will close or expand or move to other locations. The consequence of not finding appropriate alignment between education and the knowledge economy is of concern for

individual workers, as well. The report states, “The United States economy now has the largest income premium for college-educated workers among the world’s most advanced economies.”

The challenges and risks are clearly articulated and significant for all.

The shift of the United States from an industrial economy to a knowledge economy is driving the increased need for workers with additional skills and education. A second report of the Business-Higher Education Forum (2003) outlines the need for changes in teaching and learning to meet global challenges. The report emphasizes the need to build a nation of learners. When we have more workers embracing ongoing learning, we will have a more productive workforce with better economic results.

The Council on Competitiveness (1998) also claims the prosperity of United States employers and workers is threatened in today’s economy if workers do not have the necessary skills. The council singled out worker skills as the greatest competitive challenge in the United States in the next 10 years. Improving skills is necessary both for new and current workers. Employers are finding it difficult to keep up with the pace of changes, and current workers are insecure about the pace of change of the job requirements.

Community Colleges in the Knowledge Economy

Skills and knowledge of workers have grown considerably in the last 20 years (Carnevale & Desrochers, 2001) and will continue to be in demand in the knowledge economy. In fact, an important new skill of workers in the knowledge economy is the ability to be a lifelong learner (Carnevale & Desrochers, 2001; Fowler and Chernus, 2005). Workers who are comfortable with new technologies; who possess strong skills in math, reading, and writing; and who are good communicators will do well in the current and future work environment.

Community colleges, due to their historical roots, promote and encourage lifelong learning as part of their missions (Bailey & Morest, 2004). Community colleges often focus on the needs of their local communities to fulfill their mission, leading to expanded programs and services intended to meet those needs. Non-credit programs have been added and expanded, thus expanding the community colleges role in embracing and promoting lifelong learning skills.

Another reason community colleges play an important part in the knowledge economy is due to the nature of local and regional economies. Employers today must compete in a global economy to remain viable, thus creating greater standards for better education and skilled workers. While this dynamic is created due to global competition, employers rely heavily on local and state educational institutions to supply their business with workers. Community colleges historically embrace open access for their constituents, helping the community serve as a critical supplier of human capital needs (Carnevale & Desrochers, 2001).

The need to align curricula with external needs is increasing in importance for community colleges. First is the issue of mission (Grubb et al., 1997; Bailey & Morest, 2004). Comprehensive community colleges prosper by focusing on multiple missions driven by a diverse base of constituent populations. However, an underlying goal must be to align curricula for training and degree programs to meet local demands. Community colleges that are focused on and proactively understand employers' needs – not just the needs of educators – are able to better fulfill their mission.

Fulfilling their missions is not without difficulty. Community colleges are a key educational resource for an increasingly diverse group of individuals: high school students, college-age students seeking a traditional two-year transfer or occupational degree, and nontraditional students including welfare recipients, people seeking their GED, displaced

workers, and incumbent workers who need to re-tool or upgrade their skills. Tension is sometimes created in meeting the needs of such diverse student populations (Bailey & Morest, 2004).

One source of tension is that traditional academic degreed programs are usurped at times by the need for accelerated, short-term applied training programs demanded by employers. Traditional academic institutional environments also struggle with the ongoing debate of serving students for economic versus social reasons. As the complexity, variety, and level of priority of postsecondary credentials continue to grow, the comprehensive nature of community colleges will be increasingly important. Community colleges that are able to remain flexible and adapt quickly to continuous change will be the viable educational institutions that meet the current and future needs of workplace change.

Another challenge for community colleges is the level of competition in education. Employers have more options to choose from when it comes to meeting the learning needs of their employers. There are more private, for profit, and not-for-profit education and training vendors in the market today than in the past. There is simply more competition in the higher education marketplace, making it even more essential to align curricula and new programs with local needs of the employer community (Carnevale & Descrochers, 2001).

In response to these challenges, partnerships and collaboration are increasing at community colleges. Neilsen, Baird, Browning, and Milliron (2003) demonstrate that the need for creating effective partnerships with business and industry sectors is growing; indeed, partnerships at community colleges are on the increase. Leveraging these partnerships with business and industry become a win-win for the employers, the community college, and the local

community. A national effort to build a workforce system is essential if the United States is to remain at the forefront as an economic force.

Employer Workforce Studies Led by Higher Education

Not many studies have been published regarding state and regional employer workforce studies. This may suggest that not much effort is being made by government in this area, or it may be that studies and strategies are being conducted but not published or distributed in a broader context. Nonetheless, the studies are needed to inform higher education and particularly community colleges, whose mission is to serve the needs of their local communities. Indeed, the National Center on Education and the Economy (2007) asserts,

It is now clear that the most effective way to provide a real future for people who need jobs is to provide training that is related to the economic future of the region those people live in, for jobs in growth industries. (p.19)

This statement underscores the need for community college leaders to understand the global environment impacting our world. However, the understanding must also be rooted in a regional perspective where local data and decision-making is used to impact the lives of students and learners.

Very few labor market or education and training needs assessments conducted or led by higher education programs surfaced with research. This does not imply that they do not exist or that higher education institutions do not value them; it may be that not many are published as research projects in the traditional format since their purpose is geographically or industry specific. It does however, beg the question of how community colleges would find assistance if they intended to begin a study of this nature.

Two studies that surfaced were conducted by universities in the Midwest. Dharavath (2001), at the University of Wisconsin-Stout's Department of Communications, Education and Training, identified the skills needed by workers in the graphic communications industry in various segments of the Mountain States. Kotamrju, Steuernagel, and Jacquart (2002) looked at new program development strategies through a supply and demand analysis of labor market information in the state of Minnesota. The study was conducted to review how the state's college and university system determines what degree programs will be created, based on the needs for workers in various occupations in the state.

Kotamrju, Steuernagel, and Jacquart (2002) analyzed the connection between demographic trends, learner segments, and labor market information. The authors concluded that the system over the long-term was unlikely to produce a sufficient number of graduates to meet the needs of the employers and the economy. However, colleges within the state system were demonstrating program modifications to meet regional needs versus statewide needs. This study provides critical insight on why alignment is necessary especially to impact and influence long-term change.

The Washington State Board for Community and Technical College's Offices of Adult Basic Education and Workforce Education investigated how colleges could become more effective in serving low-skilled students (2005). Their goal was to better align planning processes, instructional delivery, and evaluation to better meet the workforce needs of the community. They also wished to improve literacy and workforce skills of a targeted population. The results indicate clearly developed career pathways, better engagement with employers, and better recruitment and retention measures.

Rey-Alicea and Scott (2007) analyzed five workforce readiness certificate programs to determine the benefits and costs associated. The report summarizes the findings by providing a comparison of the certificate program's success criteria, outcome data, and program costs. Finally, the report provides recommendations for states considering adoption of this type of program.

Summary

The world has become one international economy, causing new concerns about the economic competitiveness of the United States. For the United States to continue as a world leader in this rapidly changing environment, employers will need qualified workers. However, in the next 20 years, the sheer number of workers available will not keep up with the demand due to so many entering retirements. Equally concerning are the labor shortage projections for the nation and the State of Iowa. There clearly are not enough people available to fill the projected new and replacement positions identified. The increased demand for more educated and skilled workers creates an opportunity for higher education and community colleges to align programs and services accordingly.

Community colleges are a unique American education hybrid (Carnevale & Desrochers, 2001), due to their roots of mixing academic and vocational functions. The colleges will increasingly rely on leaders who understand these roles and the synergies that can be leveraged because of them. This level of understanding and perspective will keep community colleges in the forefront of workforce development issues regionally and nationally.

The education and skills needed are changing rapidly, providing new expectations for job seekers. Employers have clearly stated that their expectations have changed and will continue to change. Education and training programs must be aligned with the needs of employers

competing in the knowledge economy. Community colleges whose mission is to serve the needs of their communities and key stakeholders, namely employers, will be a critical resource for workforce and economic development initiatives.

CHAPTER THREE

METHODOLOGY

Overview

Kirkwood Community College's mission is to *identify community needs, provide accessible quality training and education, and promote opportunities for lifelong learning*. The vision is to *invent, develop, and deliver learning solutions for the 21st century*. The purpose of this dissertation was to conduct a research study to inform college administrators, the Board of Trustees, economic development partners, and the broader community about education and skill needs of employers. This quantitative study was conducted on the theoretical framework of multiple missions, participatory action research and collaborative inquiry concepts. The study used concurrent quantitative data methods to fulfill the college's mission by obtaining employer projections in Kirkwood's seven-county region regarding employment and occupational job needs as well as educational degrees desired, current training trends, and skill gaps. Surveys were conducted with employers within 12 selected industry sectors to collect changing labor market data in order to advance the college's mission and vision, as per the model suggested by Harman and MacAllum (2003).

This chapter describes the research design for the study; the sample, population, and participants; and the instrumentation. It discusses the variables and methods of analysis, as well as ethical issues taken into consideration. Finally, the timeline and budget are discussed.

Research Design

The research study used quantitative methodologies with qualitative tools to fulfill the college's mission by obtaining employer projections in Kirkwood's seven-county region

regarding employment and occupational job needs. The study design replicated a previous study conducted in 2003 in order to determine trends and patterns over a three-year period for the region in employment projections, both new and replacement positions, as well as educational and skill needs in critical occupational projections. Information was also gathered about educational degrees desired, current training trends, and skill gaps. Surveys were conducted of employers within 12 strategically selected industry sectors to collect changing labor market data.

The study was comprised of a two-part research process using two different survey instruments and different methods to obtain the data collected. Part one of the process entailed deploying a survey instrument by mail to the head of firm and the lead human resource contact of the purposefully selected sample of employers. To ensure that the study's importance was communicated internally, the request to participate in the study was mailed to the heads of companies and to human resources directors. The cover letter arrived under the signatures of the volunteer chairs of the two largest economic development organizations. These individuals are business people well known within the business community. The employers who participated in this part of the survey completed the written survey and returned it to Kirkwood Community College. The survey requested information on employment projections for both new and replacement positions by occupational categories. The survey also requested educational attainment or special training programs desired.

The second part of the research process involved another survey with multiple questions for the employer. For this phase of the research process, employers received requests to conduct face-to-face interviews or phone interviews by independent consultants.

Sample, Population, and Participants

The sample for the study was the service district of Kirkwood Community College, which consists of seven counties in the eastern part of Iowa. Employers were the only unit of analysis. Many attempts were made to obtain a database of employers for the research project in order to quantify the exact number of employers in the region. However, through various efforts, the best estimate is that no one entity provides this type of service in the region or state; therefore, no exact number exists for this purpose. Since the focus of the study was on employer's employment projections and education and skill needs in the next three years, purposeful sampling methods were used.

The two largest economic development organizations in the region focus their staff and marketing resources on seven industry sectors to grow the regional economy. The sectors include advanced manufacturing, bioprocessing/biotechnology, consumer products, information solutions, logistics/distribution, packaging/plastics and, finally, the printing industry. All seven sectors were used for the study, along with five additional sectors: education, government, health care, trades, and other. These additional sectors were been chosen because of the large number of employers in these categories.

The 250 employers selected for the 2003 study who remained in the region were selected again for this study. These employers, also within the 12 industry sectors, were originally selected by the economic development organizations. Their selection process was purposeful to ensure equal representation of companies classified as small (50 and under employees), medium (51-250 employees), and large (over 250 employees). In the event the employer was no longer in business, replacement employers were chosen within the appropriate industry sector. An additional 36 employers were added to the sample population due to adding businesses new to

the region and the expansion of two additional industry sectors for a total of 286 employers. In the 2003 study, 100 employers participated in part one of the survey process representing 23% of the region's labor pool. The Skills 2010 study had 84 employers participate in part one of the survey process, representing 25% the same percent of the region's labor pool.

Instrumentation

The study was comprised of a two-part research process using two different survey instruments and methods to obtain the data collected. To ensure that the study's importance was communicated internally, the request to participate in the study was mailed to the heads of companies and to human resources directors. The cover letter arrived under the signatures of the volunteer chairs of the two largest economic development organizations (see Appendix A and B). These individuals are businessmen who are well known within the business community. Along with the letter and the written survey was an informed consent document regarding the research project. An example of this form can be found in Appendix C.

The two survey instruments for this study were designed and used in the 2003 study. The quantitative survey instrument exactly matched the one used in the previous study. The survey instrument also used qualitative tools for certain questions and was modified slightly from the Skills 2006 study. This change was due to one of the questions from the previous study asking employers how they perceived higher education institutions in the region were meeting their needs. This question proved difficult for employers to answer since there are many four-year institutions in the region of various types and sizes. For the purpose of the Skills 2010 study, the question was modified to solicit information specific only to Kirkwood Community College. Part one of the process deployed a survey instrument by mail to the head of firm and the lead human resource contact of the purposefully selected sample of employers found in Appendix D. The

employers who participated in this part of the survey completed the written survey and returned it to Kirkwood Community College. The survey requested information on employment projections for both new and replacement positions and by occupational categories. The survey also requested educational attainment or special training programs desired.

The second part of the research process involved a different survey with multiple questions for the employer. For this phase of the research process, employers received requests to conduct face-to-face interviews or phone interviews by independent consultants. The questions focused on the investment of training programs by the employer and types of training offered as well as skill profiles of applicants and incumbent workers. Additionally, information was obtained regarding the use of internships by the employer along with overarching questions regarding workforce issues and these issues as potential impediments to growth of the business (see Appendix E).

Part One of the survey process asked the employer to project for a three-year period the number of new jobs they planned to create, as well as to project replacement needs in eight occupational categories. Instructions were provided to complete this part of the survey with a supplemental document that provided a list of the types of positions found in each occupational category. The first request was to establish a current employment baseline for each employer. The second request was for the employer to project anticipated replacement and new positions. For the purpose of this study, replacement workers were defined as those positions the employer planned to replace due to normal attrition and retirements. Additional options allowed the employer to provide educational levels desired for the occupational groups, as well as majors and/or areas of emphasis.

Part Two of the study asked for the employer's participation in a phone interview or a face-to-face interview. The survey for both phone and face-to-face methods of data collection was the same. The economic development organizations determined which employers were interviewed face-to-face and which by phone. This was done in the Skills 2003 study.

Independent consultants were hired to conduct the face-to-face interviews. The consultants who were chosen have a working relationship with Kirkwood Community College but are not employees of the institution. This method allowed employers to freely answer the questions asked in the survey process without the bias of a Kirkwood Community College employee involved in the interview process. The phone interviews were conducted by an independent research firm with trained associates conducting the survey and capturing the results. Of the original 286 employers chosen to participate in the study, 65 employers were selected for face-to-face interviews and 221 were selected for phone interviews.

The survey instrument for face-to-face and phone interviews consisted of 12 questions. The intent of this part of the survey process was to better understand training and skill needs of employers as well as overall workforce concerns. The interviews and specific survey questions allowed for employers to expand on their current experience of finding qualified workers, analyzing their abilities, or identifying education and skill gaps of their incumbent workers and providing details regarding educational program areas and specific skills.

The instrument also measured current employer participation of work-based learning opportunities for college and high school students. Investments in training and specific methods and programs were also identified. A critical question asked employers to identify the top three workforce factors impeding their ability to grow in the region. The final question was more

general in nature, allowing employers to share additional comments regarding workforce issues in the region.

Variables

The independent variable in the research study was the selected employer's employment and educational needs projections in the next three years. The employers in the study were purposefully selected from 12 industry sectors which have historically been the largest in the region or showed the greatest potential for growth based on the economies in the Technology Corridor. The two largest economic development organizations based in Cedar Rapids and Iowa City focus significant organizational resources towards the sectors of advanced manufacturing, bioprocessing/biotechnology, consumer products, and information solutions in the area of new business recruitment and retention of existing industry.

The independent variable of employer's employment projections and educational needs projections will help Kirkwood Community College, K-12 institutions, and other higher education organizations review their education and training programs in light of projected needs. Additionally, private training providers or non-profit organizations which provide programs and services can also review their programs.

The independent variable for the purpose of this study was most relevant to the theoretical perspective regarding multiple missions of community colleges and, specifically to the mission of Kirkwood Community College: the identification of community needs. Also relevant in this case were the employers served in the region.

The dependent variables included the 12 questions used for Part Two of the study. The employer's specific type of business, such as financial services or advanced manufacturing, is the independent variable which influenced the dependent variables collected in the interviews.

The questions allowed for the employer's responses to impact the need for training programs and delivery methods, skills of applicants and incumbent workers, additional program development, or capacity models in the area of work-based learning opportunities. Also impacted will be community and economic development policies and programs developed by employers to grow their business in the region.

Method of Analysis

The employment, occupation, and education data collected from Part One of the survey is organized into three tables. The tables focus on the research questions for the study, which include understanding employment projections for new and replacement positions by industry sector, occupational categories, and educational levels desired.

The first table organizes the data by workforce needs, using industry cluster sectors. The data were organized by current employees, percent of current employees in relationship to the overall number of employees represented, and replacement employees' projection, again with an overall percentage in relationship to overall projections collected. The same information was analyzed regarding new employees with numbers and percentages. Finally, the new and replacement numbers were totaled with a percentage against overall figures gathered. The second table provides the same format but organized by occupational categories for the purpose of understanding greatest need within occupations. The final tables analyze overall educational levels needed, as collected through the survey instrument. All three tables provide data analysis which is instrumental to demonstrating overall study results.

The second part of the method of analysis focused on the training, skills, internships, and overall workforce issues. For this part, 12 questions centered around current practices and trends regarding training programs and delivery methods for incumbent workers, skill gaps identified

for applicants and incumbent workers in the region, work-based learning opportunities with employers for high school and college students, as well as overall workforce concerns and industry growth. The qualitative answers from participating employers were coded for relevance to the question, themes and for repetition. Those answers with the most responses were listed in the final report as most significant in level of importance and priority.

Ethical Issues

In designing a research study of this level, ethics and attention to detail at all levels of the study were given great consideration. The needs and concerns of the employer community and the economic development partners were also considered. The employers had the option of choosing to participate in the study with no risk to the employer for participation. A consent release form was provided to the employer as part of the research process. Strict confidentiality of the employer selection process and the survey process was used. All results were calculated and reported in aggregate form. The employers had the option of being listed as study participants in the final report. The original list of employers selected and invited to participate was never released.

The gains derived from the results were greater than the risks. Previous study efforts indicate that employers wish to know what other employers are facing related to workforce concerns. Moreover, they seek workforce assistance from community organizations such as chambers of commerce and economic development organizations, as well as the education community. Therefore, participation in a regional study helps employers articulate their issues in order to gain greater assistance.

Strictest attention to detail in the data collection process by the college and by the independent interviewers, as well as clear directions regarding data retrieval from the

independent groups, ensured success of the study. The results were calculated by the author of the study with the assistance of the Office of Institutional Research at Kirkwood Community College. The final analysis and report was done by the study author and aided by the economic development partners and the leadership of the Technology Corridor Committee.

Timeline and Budget

The study was conducted between October 2007 and January 2008. Communication and notification was distributed through the major economic development partners to share with employers to prepare them for the study process. Analysis of the data and tabulation was done as results were received and continued through January 2008. A final report was developed and released to the community in April 2008. Once the report was released, an extensive communication and distribution plan was implemented to share the results with key stakeholders within the region and the state. The cost to conduct the study was \$9,300 and included the cost of the mailing to employers, printing of survey information, fees of independent consultants and the research firm, and data input. The costs did not include staff time or marketing costs to print and distribute the final study.

The results of the study will add to existing literature and research by providing a clear example of how a community college identifies needs of employers, thus also fulfilling its mission. Currently there is very little research found regarding employer needs assessments in the field. The study results also add to existing knowledge related to comprehensive community colleges working to fulfill multiple missions and competing in a global economy (Grubb et. al, 1997).

The research project and results improve practice in the field by providing a replicable study opportunity for other community colleges. The Skills 2000 and 2006 previous studies

engaged Kirkwood Community College and its economic development partners and business and industry in understanding future hiring needs by occupation levels, educational levels, and skill sets. The two previous studies both proved to be an exercise of asking, listening, and – the ultimate test – responding. The Skills 2010 provides the same results and impacts practice and future action-oriented research projects to improve the region served by Kirkwood Community College.

Summary

This chapter summarized methods used for the 2010 Skills report. Using quantitative methodologies, the study design replicated a previous study in order to determine trends in employment projects and gauge education responses necessary on the part of Kirkwood Community College. The study used survey instruments to collect data from purposefully selected employers within the seven-county service area in Eastern Iowa. Two survey instruments were used. The independent variable was the selected employer's employment and educational needs in the next three years. Dependent variables included the 12 questions used in the second part of the study. The method of analysis, part one, consisted of organizing three tables, with all three tables providing data analysis instrumental to demonstrating overall study results. The second part of the method of analysis entailed quantifiable results and coding qualitative answers from participating employers to 12 questions centered on current practices and trends regarding training programs and delivery methods for workers. Ethical issues were discussed, as was the timeline and budget for the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

In this chapter, results of the 2010 Study are reported. Key findings are shared from the employers who participated, representing 25% of the region's workforce. Employers projected that 5,117 new and 11,355 replacement workers would be needed in the next three years, with 75% of the positions requiring two-year degrees or higher. A major theme among the employer respondents was that of missing skill profiles among job applicants and existing workers. These and other results are discussed, and the demand to align education with the needs of employers is revisited. The chapter closes with a reminder of the important mission of community colleges to encourage lifelong learning and help the community serve as a critical supplier of human capital needs.

Results

The population for the study was the employer base in Kirkwood Community College's seven county service district. The estimated number of employers in the region is over 4,000. No one organization keeps or is responsible for the collection of this data, so it is difficult to find an exact number of employers in the region. For this study, purposeful sampling techniques were used. The process to determine the final sample size of 286 regional employers included the involvement of the college's economic development partner's industry cluster analysis research. Additionally, all partners agreed to add the following industries in order to capture large industry sectors outside of the economic development organizations' work: education, government, healthcare, trades, and an "other" category to capture all other participating employers. Eighty-

four employers participated in the first study, resulting in a 29% response rate; 148 companies participated in the second part of the study, resulting in a 51% response rate. The data results and all of the findings are represented throughout this chapter.

Various themes emerged which transcend and unify particular data and findings into coherent patterns. The ideas derived from the research provide the structure for the presentation of the finding and interpretation. The questions center around current practices and trends regarding training programs and delivery methods for incumbent workers, skill gaps identified for applicants and incumbent workers in the region, work-based learning opportunities with employers for high school and college students, as well as overall workforce concerns and industry growth.

Table 1. Employment Projections by Industry Sector

Classification	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Advanced Manufacturing	20,116	35%	1,824	16%	1,860	36%	3,684	22%
Bioprocessing/ Biotechnology	129	0%	10	0%	9	0%	19	0%
Consumer Products	459	1%	96	1%	150	3%	246	1%
Education	20,671	36%	4,309	38%	1,612	32%	5,921	36%
Government	1,178	2%	215	2%	55	1%	270	2%
Healthcare	3,960	7%	1,722	15%	131	3%	1,853	11%
Information Solutions	5,892	10%	1,692	15%	558	11%	2,250	14%
Logistics/ Distribution	1,391	2%	419	4%	244	5%	663	4%
Packaging/ Plastics	644	1%	256	2%	127	2%	383	2%
Printing	455	1%	302	3%	78	2%	380	2%
Trades	649	1%	78	1%	200	4%	278	2%
Other	1,895	3%	432	4%	93	2%	525	3%
GRAND TOTAL	57,439	100%	11,355	100%	5,117	100%	16,472	100%

Table 1 summarizes anticipated job openings in each of the industry sectors through the year 2010. The table shows base employment, anticipated new jobs, and anticipated replacement jobs. The total number of current employees provided by the sample was 57,437, which represents 25% of the labor force in the seven-county region, according to Iowa Workforce Development's labor statistics in January 2008. The growth in new jobs is projected to be 5,177, or 31% of the total new and replacement positions for the employers surveyed. The employers also report a total anticipated need for replacement workers at 11,355, or 69% of the total projected new and replacement positions. The employers were asked to define projections for replacement workers by including their normal turnover statistics combined with anticipated retirements. When new and replacement workers are aggregated, 16,472 workers will be needed over the next three years in the region.

Table 1 indicates that the four industry sectors with the greatest need of new and replacement workers in the next three years will be advanced manufacturing, education, healthcare, and information solutions. In each of these industry sectors the greatest number and percentage can be found in replacement workers, suggesting the impact of an aging population in the region. The number of new employees needed in the region, particularly in the category of Professional Specialties which cover professions like engineers, educators and health care professionals, will require a significant amount of attention on recruitment of people to the area.

Table 2. Workforce Needs by Occupational Categories

Category	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Clerical	9,256	16%	1,907	17%	647	13%	2,554	16%
Construction	1,353	2%	288	3%	221	4%	509	3%
Executive/ Administration/ Management	4,251	7%	622	5%	325	6%	947	6%
Labor	717	1%	177	2%	43	1%	220	1%
Marketing/Sales	1,459	3%	375	3%	210	4%	585	4%
Precision	1,339	2%	253	2%	153	3%	406	2%
Production	8,667	15%	862	8%	789	15%	1,651	10%
Professional Specialties	24,066	42%	4,856	43%	2,369	46%	7,225	44%
Service	6,331	11%	2,015	18%	360	7%	2,375	14%
Grand Total	57,439	100%	11,355	100%	5,117	100%	16,472	100%

Table 2 represents a summary of the workforce needs by Occupational Categories. Employers were asked to group their employee information by occupational classifications, which were derived from the Standard Occupational Classifications listing by the United States Department of Labor Bureau of Labor Statistics. The list used for the study was derived from the 23 major Standard Occupational Classifications (SOC) (see Appendix F). The list was delimited to only those occupational classifications that are related to the industry sectors in the region.

Of the occupational classifications provided to the employers, the largest category of need identified as it compares to any other category is Professional Specialties. The number of replacement jobs is 5,136 (45 %) and the number of new jobs is 2,382 (47%), for a total of 7,518 (46%) of the replacement and new positions. The positions found in this category represent engineers, architects, healthcare practitioners, financial specialists, and legal positions. The second highest category reported is clerical, which demonstrated a need of 1,908 (17%)

replacement positions and 647 (13%) new jobs projected. Finally, the third highest category was services, which reported a need of 1,734 (15%) of replacement positions and 346 (7%) of new positions for a total of 2,080 (13%) of replacement and new positions.

The occupational categories collected for the purpose of this study are further segmented by industry sector which can be found in Appendix G. The purpose for providing this type of data is to review occupational needs by industry sector, which is particularly beneficial when looking at current or planned programs in relationship to occupations and industries in the region.

Table 3. Workforce Needs by Educational Levels

Education Level	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
High School	18,045	32%	3,065	27%	1,295	26%	4,359	27%
Associates Degree	10,396	18%	2,655	24%	912	18%	3,567	22%
Bachelors Degree	23,540	42%	4,336	39%	2,359	47%	6,696	41%
Masters Degree	4,504	8%	1,139	10%	489	10%	1,628	10%
Doctorate Degree	26	0%	4	0%	3	0%	7	0%
Grand Total	56,511	100%	11,199	100%	5,058	100%	16,257	100%

Table 3 represents a summary of workforce needs by educational levels. Seventy-three percent of all replacement and new jobs as a percentage of the total will require education beyond a high school diploma. In addition, 51% will require a four-year or graduate degree. An interesting finding to note is in the category of new jobs: 57 % are requiring a four-year degree or greater, 75 % of newly created jobs will require a two-year degree or greater, and only 25% requiring a high school diploma. It is clear from the survey responses that education is a high

priority among area employers whether they are replacing positions or expanding their workforce.

The second part of the study focused on training, skills, internships, and overall workforce issues. For this part, 12 questions centered around current practices and trends regarding training programs and delivery methods for incumbent workers, skill gaps identified for applicants and incumbent workers in the region, work-based learning opportunities with employers for high school and college students, as well as overall workforce concerns and industry growth. Four qualitative questions provided numerous answers from participating employers. The answers were coded for relevance to the question, themes and for repetition. The answers with the most responses were listed in the final report as most significant in level of importance and priority.

Table 4 represents how employers are meeting training needs of their incumbent workers. Many of the respondents indicate that they do provide training for their employees. A large percentage of the employers offer in-house training with the second highest category representing a combination of in-house and external training programs. Only two of the employers indicate that they do not provide training.

Table 4. Types of Training Programs

Type	Number	Percent
In-house	92	63%
External	33	22%
Other	21	14%
No training provided	2	1%
Total	148	100%

Table 5 represents the responses to the question regarding the use of online training programs for current employees. The answers provided to this question indicate an almost equal split between employers who use online training programs and those who do not. The percentage of employers who do not offer online training programs for employees came in only a couple points higher than the percentage of those employers who do.

Table 5. Use of Online Training Programs

Answer	Number	Percent
Yes	71	48%
No	74	51%
Unknown	3	2%
Total	148	100%

Table 6 provides data for those employers who indicate they use online training programs and which types are specifically used. Of the 71 employers who indicated they do provide online training programs, 44% use customized products. The next highest category use a combination of customized and off-the shelf products. The lowest category was off-the-shelf programs.

Table 6. Current Training Programs

Type	Number	Percent
Off-the-shelf	10	14%
Customized	31	44%
Combination of the above	18	25%
Other	12	17%
Not used	0	0%
Total	71	100%

Table 7 reflects employer information regarding barriers to using online training programs. The greatest percentage of responses fell into the category of other after they were given technology, cost, or personnel as choices. The second highest response for this question was technology.

Table 7. Online Training Barriers

Type	Number	Percent
Technology	25	38%
Cost	9	14%
No personnel to oversee	3	4%
Other	29	44%
Total	66	100%

Table 8 lists the responses of the survey participants into categories of online training program type. Of the employers who provided responses to the types of online training programs used, the greatest response was in the category of technical training.

Table 8. Types of Online Training Programs

Type	Number	Percent
Technical training	34	55%
Soft skills training	20	32%
Other	8	13%
Total	62	100%

Table 9 separates the responses of barriers for online training programs from the employers who indicated they do not use online training programs. Interestingly enough, the category of other received the greatest responses, leading to an inconclusive response for this question.

Table 9. Employer Barriers Not Using Online Training

Answer	Number	Percent
Technology	5	10%
Cost	3	6%
No personnel to oversee	2	4%
Other	28	56%
None	12	24%
Total	50	100%

To summarize the responses of employers regarding the use and investment of online training questions found in Tables 5-9: overall, just under half of the employers who responded to this part of the survey indicate they use online training programs, with the other half indicating they do not. The largest categories of online training programs include technical and a combination of technical and soft skills. Of those who do use online training programs, the responses were varied related to concerns and barriers of this type of training. Of those employers who reported they do not use online training programs, the responses were varied, as well.

Table 10 and Table 11 represent the use of internships within an employer's organization and, more specifically, whether the organization provides opportunities for high school students and college students.

Table 10. Employers Providing Internships

Answer	Number	Percent
Yes	86	60%
No	57	40%
Total	143	100%

Table 11. Number of College or High School Internships

Answer	Count	Percent
College	58	84%
High School	11	16%
Total	69	100%

Overall, 60 % of the employers indicate offering work-based learning programs as a part of their workforce strategies. Of those employers who defined whether their internships were for college or high school students, only 16 % offer opportunities for high school students. More than the majority offer internships for college students.

As part of the study design there were four questions intentionally designed in an open-ended format. For these questions, extensive coding processes were used in order to determine the overall themes for these questions. Two of the questions focused on skills needed or missing among applicants for positions and then for their incumbent workers. The first step for coding these questions was a review of all of the initial comments for overall themes. The second step was to separate the essential and technical skills. The third step was to review the essential skills and separate foundational from soft skills.

In the coding process between the first step and second step, any outlier comments were removed if the answer given did not fit with the original question. The second step required a determination of separating technical skills from essential skills. Technical skills were defined as requiring specific training or education in order to perform a task not found in general academic requirements. Examples of this would include advanced levels of computer applications, skilled trades, and welding. The third and final step was to review all responses found in the essential skill area and separate the responses from foundational skills such as language, grammar, and spelling from soft skills which center on motivation, personality, and professionalism. Foundational skills are those developed in general educational curriculum programs in the United States; the soft skills are based more on an individual's personality as is suggested in the SCANS report (1991).

The responses by employers regarding the skills missing from applicants were as follows: 73% indicated critical skills were missing from their applicant pools, with 20% indicating no concerns and 7% not providing an answer. Of the 73% who indicated they were missing critical skills, 53% of the comments focused on essential foundational and soft skills and 47% were in the technical skill area.

Specifically, the major themes for essential foundational skills indicated the need for a high school degree, better grammar and spelling capabilities, and better problem solving skills. In the area of soft skills, a lack of communication skills, customer service skills, and work ethic received the greatest number of response. Finally, the technical skill area focused on computer skills, a lack of adequate industry experience, and math.

The next question asked employers what skills were missing from their current workforce or incumbent workers. Once again, the three-step coding process was deployed in order to

determine the overall themes. Overall, 59% of the respondents indicated skills were missing from their incumbent worker pool, 36% of the respondents indicated no concerns, and 5% indicated they were unable to answer the question. Of those who did list concerns, the list was equally split regarding skills lacking in technical and essentials skill areas. In the area of technical skills (again, defined as those that require some form of advanced training or education), the responses were computer skills, technology skills, and industry specific skills. In the area of essential foundation skills, conflict resolution and writing were noted as missing. In the area of soft skills, communication, work ethic, and customer service all received the highest responses.

The two final open-ended questions were overarching in nature but also related to workforce concerns and its impact on growth of their business in the region. These two questions allowed the employer to provide more in-depth responses to workforce issues and concerns than allowed by the previous questions. The answers gathered provided a greater understanding of the complexities of the overall issue. The themes also provide direction for an action agenda by invested community partners to deploy change and thus support the employer. The questions were: What are the top three workforce factors impeding your ability to grow or expand in this region? What are your overall workforce concerns?

Regarding the top three workforce factors impeding growth, two responses are related to the importance of an available, productive, and educated workforce: a lack of skilled or qualified candidates to choose from and a small labor pool and low unemployment in the regions. The last response—a concern with keeping wages and benefits in line with the pressures of the cost of doing business—was indicative of the economic climate employers are currently competing in on a regional, state, national, and international level. Comments from employers that support

these overall themes included: “Improve the number of qualified applicants.” “Need people with appropriate job skills.” “Biggest challenge is to access qualified engineers.” “It is imperative that we continue to attract skilled workers to this area.” “Attracting good paying businesses will help attract workers.”

The final question of the survey asked employers to provide any additional comments regarding workforce needs in the region. Many of the same responses surfaced regarding workforce issues impeding growth. Employers were concerned about finding a skilled and qualified candidate pool to hire during a time of a tight labor market and low unemployment in the region. They expected Kirkwood Community College to continue to be a community resource for employers and workers alike. Comments from employers included: “Seems to be a lack of math, communication, work and just basic skills.” “Workforce needs are going to be changing as baby boomers retire.” “Current workforce is aging and there is going to be a shortage of available labor.” “Help us find more people to hire...attract new people to come to town.”

Key Findings

Eighty-four employers participated in this part of the survey, which represented 25% of the region’s workforce, based on Iowa Workforce Development’s employment statistics as of January 2008. Employers projected that 5,117 new and 11,355 replacement workers—a total of 16, 472—will be needed in the next three years. (The projection for replacement workers is based on normal turnover and retirements.) This is a large number of new and replacement positions for this region, especially when coupled with the educational requirements and specific occupational categories.

The combination of the education, healthcare, and advanced manufacturing industry sectors, coupled with the occupational classifications of professional specialties and executive/administration/management, suggest job candidates needed at least a bachelor-level degree along with industry experience. The other major occupational categories with the greatest needs included clerical and service. Overall, employers stated that positions in the study required a minimum of a high school degree and 75% of the positions required two-year degrees or higher. This need will put tremendous pressure on educational institutions as well as community-based organizations to assist employers in finding the numbers of workers needed identified in the study. Moreover, the level of education needed by the employers will stretch institutions of higher education in the region to keep pace with numbers of workers desired.

Employers are investing in training programs for workers which are crucial for employers to remain competitive and for workers to keep improving their skills. Only half of the employers are using online training programs, which suggests some employers are slow to embrace this technology for their workers. Additionally, the lack of work-based learning opportunities for high school students indicates a lack of exposure and awareness for young people in the region prior to their post-secondary plans, whether it be work or higher education. Internships for college students were much higher, but more opportunity exists in this area.

The overarching issues identified in this research are consistent with state and national research findings identified in the literature review. The significance of these issues for the region is embedded in the complexity of employers competing in a global economy needing a more educated and trained workforce. Furthermore, the local workforce needs more education and awareness regarding workforce expectations of employers. Kirkwood Community College

must understand the critical role it plays in continuing to be a community resource for employers and workers alike.

Discussion

Gunderson, Jones, and Scanland (2004) refer to the Bureau of Labor Statistics' prediction that in the year 2030, 41 million workers will enter the workforce; however, an alarming 76 million workers will enter retirement. The shortage gap is projected to spread in 2010 and widen dramatically over a 20-year period of time. If this projection materializes over the next 20 years, all education communities must understand the skills and education needed for future job requirements.

Americas Choice: High Skills or Low Wages (1990) and the follow up report, *Tough Choices or Tough Times* (2007) both released by the National Center on Education and The Economy, articulate the gap of education and skills needed by United States companies versus those obtained by United States employees. The gap is due to advancements of technology; however, a critical dynamic is responding to rapid workplace change in relationship to the number of American-educated workers to fill current and future workforce needs.

The 2007 report confirmed what the 1990 report projected as a threat to the United States: those lower-skilled positions migrated to other countries where pay was lower. In addition, the 2007 report states that 30 years ago the United States could lay claim to having 30% of the world's population of college students, while today the number is 14% and continuing to decline. Both reports suggest that the ability of the United States to compete economically is threatened because of these two primary factors.

On a statewide basis, the Iowa Workforce Development (2007) offers a report with industry projections for the state and regions every two years using a formula based on input

from the Bureau of Labor Statistics' national long-term projections and indicator data. The projections from 2004-2014, using 25 industry codes, are that the Iowa economy will add more than 216,000 new jobs. This is a growth rate of 13.6 % for the 10 years used in the projection, with the two largest occupational categories expected to be in professional and services occupations. Another key finding in the report is that 54% of all occupations in the state require post-secondary education or higher.

In this research study, employers identified that 5,117 new and 11,355 replacement workers—a total of 16, 472—will be needed in Kirkwood Community College's region over the next three years. (The projection for replacement workers is defined as normal turnover and retirements.) This is a significant number of new and replacement positions for this region, especially when coupled with the educational requirements and specific occupational categories. The educational levels identified in the Skills 2010 report also exceed state projections, with 75% requiring a minimum of a two-year degree or greater.

As was discussed earlier, Gunderson, Jones, and Scanland (2004) suggest that the challenge to higher education is relevance. Corporate universities have grown exponentially: 2,000 in comparison with 3,600 accredited colleges and universities. (Corporate universities are formal training and education programs established within an employer's organizational structure to invest in skill development of their employees.) The message is clear: employers need skilled workers in order to stay competitive and are willing to invest in education and training to do so. Higher education can choose to stay the traditional academic course, align with the needs of business and industry or become multi-purpose organizations.

Business-Higher Education Forum's *Spanning the Chasm: A Blueprint for Action* (1999), argues that business and education need to work together and improve lines of communication.

Collaboration and cooperation between business and industry and higher education must increase in order for workers to be prepared to meet the challenges of the global economy. Businesses and workers alike are competing in this changing market.

The Demand for Alignment

Aligning education with the needs of employers in the knowledge economy is crucial, as is understanding the need for additional and better human capital to further foster economic growth of the American economy. The shift of the United States from an industrial economy to a knowledge economy is driving the increased need for workers with additional skills and education. A second report of the Business-Higher Education Forum (2003) outlines the need for changes in teaching and learning to meet global challenges. The report emphasizes the need to build a nation of learners. When we have more workers embracing ongoing learning, we will have a more productive workforce with better economic results.

For a community college to be labor market responsive, it must actively consider the local and national economic environment and be able to deliver educational and training programs that directly address labor market needs, often in a very short time. Community colleges are well suited to assume this role, as they generally are nimble at curricula development, particularly with respect to non-credit programs. Community college administrators are beginning to transform the processes of delivering educational and training programs, allowing colleges to respond more quickly to labor market changes. Partnerships with employers and community organizations, a mission statement giving a high priority to workforce development, and specialized contract training are all part of responding to workforce development needs.

Mission Critical

Community colleges, due to their historical roots, promote and encourage lifelong learning as part of their missions (Bailey & Morest, 2004). Community colleges often focus on the needs of their local communities to fulfill their mission, leading to expanded programs and services intended to meet those needs. Non-credit programs have been added and expanded, thus expanding the community colleges role in embracing and promoting lifelong learning skills.

Community colleges play an important part in the knowledge economy due to the nature of their focus on local and regional economies. Employers are competing in a global economy to remain viable, thus creating higher expectations for better education and skilled workers. While this dynamic is created due to global competition, employers rely heavily on local and state educational institutions to supply workers. Community colleges historically embrace open access for their constituents, helping the community serve as a critical supplier of human capital needs (Carnevale & Desrochers, 2001).

Summary

The need to align curricula with external needs is increasing in importance for community colleges. First is the issue of mission (Grubb et al., 1997; Bailey & Morest, 2004). Comprehensive community colleges are driven by a diverse base of constituent populations. A critical goal must be to align curricula for training and degreed programs to meet local demands of employers. Community colleges that are focused on and proactively understand employers' needs—not just the needs of educators—are able to better fulfill their mission.

The Cedar Rapids/Iowa City Technology Corridor is a critical area of the region served by Kirkwood Community College. The employers in the region are conducting business in a global economy. At the same time, citizens in the region need education and training programs

that allow them to stay competitive in the workforce or gain employment, according to the National Center on Education and the Economy (2007). It is Kirkwood's mission to identify the needs of both of these important stakeholders and to provide critical learning solutions in order to help the region to stay economically strong.

The purpose of this study was to gain relevant information about employment and skill needs from employers so that Kirkwood and its economic development partners and their business leaders can advocate and promote an action agenda to assist employers in a highly competitive, global economy. By deploying strong research methods, the results allowed for a more in-depth and detailed understanding of the issues with a clear goal at the end of the study to advance an action agenda for the region regarding workforce development strategies.

CHAPTER FIVE

CONCLUSIONS

Overview

In the past few years, we have seen considerable change in the economy in Eastern Iowa, the state, and the nation. In order for the region served by Kirkwood Community College to be successful in economic development efforts, it is important that information be gained from area employers regarding workforce needs. This study provides current information about employment trends and employee training needs for continued successes among Corridor employers.

The study built on the Corridor's continued efforts to identify and develop the finest workforce tools to build the greatest business success. In addition, the study reflected the successes of the recommendations outlined in the Skills 2006 study report and built on the first Skills 2000 report conducted in 2003 and 1998, respectively. In order to respond to ongoing workforce issues identified by employers in the region, a quantitative study was conducted in order to get a full understanding of all of the issues. The research study involved two different surveys using various methods of data collection. Purposeful sampling techniques were used in selecting employers from 12 industry clusters, with careful consideration of small, medium, and large employers as well as geographic representation from throughout Kirkwood Community College's seven-county service area.

Letters were sent to the chief executive officer of the organization and the lead human resource professional asking them to participate. The first part of the survey asked employers to provide current employment figures along with projections for replacement positions, including

normal turnover and anticipated retirements as well as new job growth. Of the 286 who were invited to participate, 84 returned the survey, providing a 29% return rate. The second part of the survey asked the employer a series of questions regarding training trends, skill profiles missing, as well as utilization of work-based learning programs. Independent contractors were hired to conduct phone and face-to-face meetings to conduct interviews to gather this data. Of the 286 employers invited to participate, 148 provided information for 51% response rate. The projections of the 84 employers who participated in this part of the survey, which represents 25% of the region's labor pool, based on Iowa Workforce Development's employment statistics as of January 2008.

This chapter continues a discussion of Skills 2010 study results and conclusions. Recommendations for further study are considered and provided. The role of community colleges is revisited, with a new paradigm suggested. The chapter concludes by offering implications for practice in higher education.

Summary and Discussion

Employers identified 5,117 new and 11,355 replacement workers—a total of 16,472—will be needed in the next three years. (The projection for replacement workers is due to normal turnover and retirements.) Overall, the theme among employer respondents is related to missing skill profiles among job applicants and existing workers in the region. The highlights include: 73% indicated critical skills were missing from their applicant pools, and 59% of the respondents indicated skills were missing from their incumbent worker pool. Employers identified technical and essential foundational and soft skills as lacking in both applicant pool and among their existing workers. Seventy-five percent of all replacement and new jobs as a percentage of the total will require education beyond a high school diploma.

Of the employers surveyed, only 60% of the employers provide work-based learning opportunities for students and only 16% provide internships for high school students. Almost all of the employers surveyed provide training for their employees, with 48% using online training tools. Of those employers who provide “in-house” training programs for employees, the employers are investing in their own staff to provide training versus purchasing it from a vendor. Employers who provide online training programs use customized programs. Barriers were identified by employers in using online training programs, but many chose the category of “other” when answering this question. This answer was consistent with those employers who do not use online training programs. Many employers who participated in the study use online training programs to provide technical training.

The overarching themes identified by employers include the affordability, availability, and capability of the workforce. Employers expressed concern over the cost of labor and benefits as it relates to the cost of doing business. One small employer stated that he is “losing employees because we can’t afford healthcare insurance.” Employers stressed the importance of getting information on wage and benefit figures in order to understand market conditions. Moreover, the lack of qualified candidates and the skill profile gaps of job applicants and incumbent workers was a prevalent theme in the study. One employer stated, “Market is tight for qualified people.” Another employer shared concerns over students needing assistance with life skills and being able to “sell” their abilities in an interview process. Another company said, “Not a lot of technical people in this area.” One of the most significant comments from an employer was, “Wish people would stay in the state of Iowa.” All of these concerns and factors contribute to an underlying need for better alignment between employers and education providers in order to impact the need for a qualified and supply workforce.

Recommendations for Further Study

After reviewing the study design and results, the research study process and the instruments for this study could be used to continue the effort to provide relevant and timely data by industry sectors on an ongoing basis. Specific industry sectors could be identified in the region and the instrument sent on a more regular basis to those specific employers; then the data could be tabulated by industry sector to provide more in-depth education and skill needs per industry sector. By doing this on a more frequent basis, the data would provide up-to-date information which area educators could use for changing current programs and new program development.

The changing nature of the economic environment for employers, coupled with the growth of new businesses and industries in the region, would suggest that ongoing, regular studies help higher education and community partners stay current with workforce trends for the enhancement and development of education and training programs. A strategy of this type would also allow for expansion of additional industry sectors. As it relates to conducting studies on a more frequent basis, some employers did communicate that the time of the year to complete the study was problematic. Most of the responses received indicated that the fourth quarter was a busy time for human resource departments which may have contributed to a lower return rate on the first part of the survey. In the future, consideration of the study timeline should be further explored with employers.

Another approach for consideration would be to conduct this type of research by an entire community college system covering multiple regions. This effort would provide relevant information for each individual region but then could be aggregated on a statewide level, which would be more influential for policy direction on a state and national level. Using a broader base

of employers could improve upon the response rate of employers. Community colleges are governed differently throughout the United States, but where there are statewide systems, this research process could be used. A study which provides a great model for alignment of educational programs, and more specifically, number of graduates as compared to employer need, is one by Kotamrju, Steuernagel, and Jacquart (2002). They analyzed the connection between demographic trends, learner segments, and labor market information for the Minnesota system of higher education. As a result, the authors concluded that the system over the long-term was unlikely to produce a sufficient number of graduates to meet the needs of the employers and the economy. However, they were able to demonstrate in specific cases where new programs were being developed in relationship to the research results.

Role of Community Colleges

For community colleges that embrace the concept of multiple missions, financial resources are necessary to provide the scope of needed services. In this type of internal and external struggle to “be all things to all people,” resources, both human and financial, are scarce for conducting this type of research. However, this type of data often provides the catalyst for change among key stakeholders. The entire research process is a significant resource to all of the major stakeholders: legislators, future and current students, K-12 educators, employers, and taxpayers alike. However, a significant change among community college leaders and board members needs to occur in order for this to become a reality.

Leadership of community colleges is focused and centered on its core mission to provide education programs to students. This limited focus often drives resources only to instruction and student-related services such as advising and counseling. Too often the need to serve another critical customer such as the employer is not a priority. Employers are typically viewed as

potential paying customers of non-credit contracted and open enrollment programs. Additionally, community colleges for the most part do not conduct research as part of their core services. Often times because it is cost prohibitive and resources intensive to do so. However, research data is needed to inform effective and accurate decision-making related to program investment. Supporting research is the responsibility of senior leadership and governing boards, respectively. But more importantly, employers need to be treated as a priority, as they are ultimately the end-user of students graduating from community college programs.

Community colleges, due to their historical roots, promote and encourage lifelong learning as part of their missions (Bailey & Morest, 2004). Community colleges often focus on the needs of their local communities to fulfill their mission, leading to expanded programs and services intended to meet those needs. Non-credit programs have been added and expanded, thus expanding the community college's role in embracing and promoting lifelong learning skills.

The 2010 Study exemplifies Kirkwood Community College's mission. The study identifies a community need—in this case, the employers in its service region. The results of the study provide timely and relevant data which suggests the need for a well-trained and educated workforce. The study results demonstrate which occupational areas and industry sectors are in need of formal credit programs. The results provide evidence that more training and education is also needed from non-credit programs to invest in skills of current workers and community citizens alike. The data can be used by a wide variety of community-based organizations, K-12 education entities, higher education organizations, economic development, and chamber groups in order to align programs and initiatives around the study results. This research study puts Kirkwood Community College at the center of its mission and its service region and serves as a catalyst for change. The study results provide the impetus for an action agenda both internal to

the organization and externally with its partners to provide solutions for its diverse constituents, as well as key stakeholders.

As a result of this study an extensive communication and distribution plan will be implemented by Kirkwood Community College and its economic development partners. The report will be distributed to all media outlets in a media conference led by the business leaders of the Technology Corridor Committee. Additionally, the report will be distributed and presented to K-12 boards, superintendents, guidance counselors, and curriculum planners. The report will be sent to state and local elected officers, as well as disseminated to the Governor's office and other state agencies. Presentations will be made to local organizations such as Rotary and Lions Groups. Professional associations for human resource people will be tapped for opportunities to share the results and the action agenda.

The action agenda for the region as a result of this study is outlined by the following recommendations: (a) Corridor employers must continue to stress the importance of foundational skills for future and incumbent employees by requiring or recommending the Skills Advantage Work Ready Certificate, a regional "work ready" certificate developed by Kirkwood Community College as a result of the 2006 Study. In addition, movement towards recommending or requiring the Skills Advantage Core + certificate and personality tests should be made. (b) Educational institutions need to adapt curriculum and graduation requirements accordingly. More work-based linkages for K-12 and postsecondary students will result in a prepared and engaged workforce. There must be additional emphasis placed on the importance of a seamless system delivery between K-12 and regional higher education institutions. (c) More efforts need to be made within Eastern Iowa to educate high school and college students about the employment opportunities available within the Corridor. (d) Corridor employers must be proactive in recruiting new

employees from outside the region and the State of Iowa. Regional and state population growth will not keep pace with the workforce demands of local employers. More efforts could be made to develop and implement more tools to attract workers with college degrees and certification.

(e) Kirkwood Community College needs to provide wage and benefit data on a regular basis to existing companies to aid them in their recruitment and retention work. (f) Area employers must work to create workplace cultures which embrace many generations of workers and diversity.

The Technology Corridor committee is comprised of area business leaders. This committee sponsored the research project and as part of their leadership they ask for accountability from their staff regarding the recommendations. It is this type of responsibility that will lead to implementation of the action and agenda and lead to change for the region regarding employer workforce needs. As part of the action research cycle, an evaluation of the project will need to be conducted for future research purposes.

Additionally, the senior leadership team at Kirkwood will review not only the community report but more specifically the raw data and comments in order to develop an internal action plan. Once this is accomplished the Kirkwood Board of Trustees will be presented with the study findings and internal and community recommendations. The larger administrative team will also be presented with the study results and included in the discussion and planning phase for the internal plan of action.

Community colleges play an important part in the knowledge economy because of the nature of serving their local and regional economies. Employers today must compete in a global economy to remain viable, thus creating higher expectations for current and future workers. While this dynamic is created due to global competition, employers rely heavily on local and state educational institutions to supply their workforce needs. Community colleges historically

embrace open access for their constituents, helping the community serve as a critical supplier of human capital needs (Carnevale & Desrochers, 2001).

The need to align curricula with external needs is increasing in importance for community colleges. First is the issue of mission (Grubb et al., 1997; Bailey & Morest, 2004). Comprehensive community colleges prosper by focusing on multiple missions driven by a diverse base of constituent populations. However, an underlying goal must be to align curricula for training and degree programs to meet local demands. Community colleges that are focused on and proactively understand employers' needs—not just the needs of educators—are able to better fulfill their mission.

A New Paradigm

The significance of timely and relevant data for policymakers and decision makers of all types cannot be underestimated. Understanding the specific new and replacement jobs by occupations and education desired by employers among industry sectors can be easily translated into whether education programs on a system level have the capacity to meet these demands. This data, along with current program educational specific data, is what creates the alignment that is needed for employers and education to stay at the forefront of these complex workforce issues.

For the paradigm shift from traditional (or “regular”) to entrepreneurial to occur, community colleges leaders need to view the employer community as a key stakeholder or customer, much like the student or learner is embraced. The employer is the ultimate end-user of the successful outcomes of higher education institutions. Employers and students alike have expectations that the curriculum provided will be relevant and useful to the needs of the workplace and the students' desires to have careers in that workplace. This philosophical change

is needed in order for economic success to occur on a regional, state, and national level.

Community colleges are a unique American education hybrid (Carnevale & Desrochers, 2001), due to their roots of mixing academic and vocational functions. The colleges will increasingly rely on leaders who understand these roles and the synergies that can be leveraged because of them. This level of understanding and perspective will keep community colleges in the forefront of workforce development issues regionally and nationally.

If the change is understood, embraced, acted upon regionally, and supported at a state and national level, there is far greater chance of success for both employers and individuals. This differs greatly from current practice, with national or state policy often adopted in a “one size fits all” mentality and then imposed on all regions to implement, whether appropriate or not.

Implications for Practice

Very few labor market or education and training needs assessments conducted or led by higher education programs surfaced in the literature review for this research study. A lack of current data also continues to exist regarding area employment projections, occupational positions, and educational needs. The Skills 2010 research study provides critical information for a community college and its economic development partners in order to shape education and training programs as well as develop relevant workforce tools to assist employers in an international economy. The study provides the impetus for the community college to establish strong relationships with its economic development partners and the members of their respective boards which are often higher in higher management positions within the organization. The results provide relevant and timely data to influence the college’s position with a variety of stakeholders.

The results of this study add to existing literature and research by providing a clear example of how a community college fulfills part of its mission by identifying needs of employers. The study results will also add to existing knowledge related to comprehensive community colleges working to fulfill multiple missions and competing in a global economy (Grubb et. al, 1997). The Skills 2010 research study improves practice in the field by providing a replicable study opportunity for other community colleges.

The results can impact governmental policy work at the local, state, and national levels. It can help influence change in curriculum and standards at the local and state levels. It also brings to the forefront the significant resources necessary in order for employers and education alike to keep up with changing workplace demands in a global environment.

The results of this study emphasize the importance of education for all of our citizens beyond a high school degree. The need for technical and soft skills further defines the complexity of the workforce for current and future workers. Education and training programs must continue to align to address these complexities.

Furthermore, the research findings and the study results provide important data to communicate with K-12 education partners to open dialogue regarding education, training, and skills needed by the employer community to further emphasize the need for a seamless education system. Finally, the study results open community discussions among all stakeholders for the purpose of bettering the citizens and the employers in the region. The issue of alignment in this dialogue is again a critical concept in order to impact change at the level identified.

Summary

A comprehensive, broad-based institution that embodies the belief that all people have value must be at the center of a successful workforce development program. One such institution

is Kirkwood Community College. Kirkwood's mission and vision statement are central to its success of serving individuals and the employer community in its 42-year history. Nonetheless, the stakes are higher and the need is greater than ever to serve individuals and the employer community equally.

Increased global competition will continue to affect the type of work being done in American workplaces, creating new high-skilled jobs and lessening demand for unskilled work. The impact will continue to grow as more of the economy is involved in producing exports or competing with imports. Contributing factors to economic expansion internationally include new technologies, increased trade, multinational brands and companies, and international finance. While the Internet and other new technologies have created a more open market for promoting products and services, the same international market, open for all to explore, is also creating new workforce challenges.

All of these influencers create critical dynamics for employers in our region. Responding to rapid workplace change in relationship to the number of educated and skilled workers to fill current and future workforce needs is imperative. This research study and the ensuing results and recommendations will continue to provide the region and Kirkwood Community College with critical direction to meet the changing dynamics of an international economy's impact on regional employer's workplace requirements. Kirkwood Community College has been and will continue to be the connector of its key stakeholders to provide critical leadership in order to meet the demands of this rapidly changing international economy.

APPENDIX A. EXAMPLE OF CEO LETTER

Date

Firm name

Title

CEO

Address

Address 2

City State Zip

Dear FNAME:

We invite you to continue to partner for an important economic development initiative. The Technology Corridor Committee, made up of representatives from Kirkwood Community College and the economic development organizations - Iowa City Area Development Group and Priority One, are cooperating to develop the Skills 2010 study that updates the Corridor's ongoing workforce needs.

This important new study will provide up-to-date information about employment trends and employee training needs for continued successes among our Corridor businesses. The new study will also revise the Corridor's employment and training needs in the following areas:

- ◆ advanced manufacturing
- ◆ bioprocessing/biotechnology
- ◆ consumer products
- ◆ education
- ◆ information solutions
- ◆ government
- ◆ healthcare
- ◆ logistics/distribution
- ◆ packaging/plastics
- ◆ printing
- ◆ trades
- ◆ other selected industries

The Skills 2010 report builds on the Corridor's continued efforts to identify and develop the finest workforce tools to build the greatest business success. In addition, the Skills 2010 report will reflect the successes of the recommendations outlined in the Skills 2006 report and build on the first Skills 2000 report.

Your continued participation will allow your business an opportunity for input to develop tomorrow's workforce that fits your business needs. Your sustained participation will also provide objective data to guide public policy debates concerning the types of workers and education needed to meet growth projections, changes in employment, demographics and technology needs of Corridor companies.

A written survey form will be sent to your Human Resources Director to complete by November 9, 2007. The survey asks you to project your hiring and education needs through 2010. The second part of the survey, which addresses training and education trends/needs within your organization, will be conducted by a consultant. The consultant will call your Human Resources Director to arrange a meeting time. However, it's our hope you will both participate in this portion of the survey.

We sincerely hope you will participate in the Skills 2010 survey. We do appreciate your willingness to join this effort to enhance the workforce and the economy in the Technology Corridor.

Best regards,

A handwritten signature in black ink, appearing to read "Jeff Disterhoft".

Jeff Disterhoft
President/CEO, University of Iowa Credit Union
Chair, Iowa City Area Development Group

A handwritten signature in black ink, appearing to read "Jim Tinker".

Jim Tinker
President Emeritus, MercyCare Service Corporation
Chair, Priority One

APPENDIX B. EXAMPLE OF HUMAN RESOURCES DIRECTOR LETTER

Date

Firm name

Title

HR

Address

City State Zip

Dear FNAME:

We invite you to continue to partner for an important economic development initiative. The Technology Corridor Committee, made up of representatives from Kirkwood Community College and the economic development organizations - Iowa City Area Development Group and Priority One, are cooperating to develop the Skills 2010 study that updates the Corridor's ongoing workforce needs.

This important new study will provide up-to-date information about employment trends and employee training needs for continued successes among our Corridor businesses. The new study will also revise the Corridor's employment and training needs in the following areas:

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- ◆ bioprocessing/biotechnology
- ◆ consumer products
- ◆ education
- ◆ information solutions
- ◆ government

- ◆ healthcare
- ◆ logistics/distribution
- ◆ packaging/plastics
- ◆ printing
- ◆ trades
- ◆ other selected industries

The Skills 2010 report builds on the Corridor's continued efforts to identify and develop the finest workforce tools to build the greatest business success. In addition, the Skills 2010 report will reflect the successes of the recommendations outlined in the Skills 2006 report and build on the first Skills 2000 report.

Your continued participation will allow your business an opportunity for input to develop tomorrow's workforce that fits your business needs. Your sustained participation will also provide objective data to guide public policy debates concerning the types of workers and education needed to meet growth projections, changes in employment, demographics and technology needs of Corridor companies.

This is a two-part survey process. The first step is for you to complete the Employee Information Survey along with the Informed Consent Form and fax it to 319-398-5432 by November 9, 2007. Detailed instructions are attached to the form. The survey asks you to project your hiring and education needs through 2010. The second part of the survey, which addresses training and education trends/needs within your organization, will be conducted by a consultant. ***The consultant will contact you to arrange a meeting time.*** A letter has also been sent to your CEO regarding this project and encourages their support of participating in the face-to-face interview with you.

We sincerely hope you will participate in the Skills 2010 survey. We do appreciate your willingness to join this effort to enhance the workforce and the economy in the Technology Corridor.

Best regards,



Jeff Disterhoft
President/CEO, University of Iowa Credit Union
Chair, Iowa City Area Development Group



Jim Tinker
President Emeritus, MercyCare Service Corporation
Chair, Priority One

APPENDIX C. INFORMED CONSENT DOCUMENT

Skills 2010 Informed Consent Document

The Skills 2010 project is a study to determine Employers' skill and employment needs from 2008 through 2010 in Kirkwood Community College's service area called Region 10. The study will be conducted from October 1 – December, 2007. The study is a replication of a previous study called Skills 2006 which was conducted by Kirkwood Community College in 2003. Please complete this form and send it back with your survey information.

Description of Procedures

If you agree to participate in this study you agree to complete Part one of the survey by November 20, 2007 and agree to either a phone or face-to-interview will last no more than one hour in length.

Risks

The risks to your organization are minimal. The survey results will be kept confidential and reported in aggregate. The data will be sent to the Kirkwood Community College Continuing Education Department and will be tabulated by the Kirkwood Community College Institutional Research Department. Final analysis and reporting will be conducted by the Vice President of Continuing Education and Training Services at Kirkwood Community College.

Benefits

The value of participating in this research study is to provide employers the opportunity to voice satisfaction or dissatisfaction related to education, training and overall economic workforce development in the region. By participating in the study, you will provide critical information to help shape future programs and initiatives.

Costs and Compensation

There is no cost to participate in the study. Your only commitment will be the time involved to complete the employment and education projections worksheet and to participate in a phone or face-to-face interview. There is no compensation offered as a part of the research project.

Participant Rights

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time.

Confidentiality

Records identifying participants will be kept confidential to the extent permitted and will not be made publicly available. The data will be sent to the Kirkwood Community College Continuing Education Department and will be tabulated by the Kirkwood Community

College Institutional Research Department. Final analysis and reporting will be conducted by the Vice President of Continuing Education and Training Services at Kirkwood Community College.

Questions or Concerns

You are encouraged to ask questions at any time during the study. For further information about the study, please contact Dee Baird, Vice President of Continuing Education and Training Services at Kirkwood Community College. The phone number is 319-398-5886 or email dee.baird@kirkwood.edu.

Employer's Name

Signature of Employer Representative

Date

APPENDIX D. SKILLS 2010 EMPLOYEE INFORMATION SURVEY

	Current Employees Year 2007	Anticipated Replacement	Anticipated New Jobs	Total Anticipated	
Occupational Groups	Base	2010	2010	Hires 2010	Education Level/Major
Executive, Administrative and Managerial Occupations					
Professional Specialty Occupations					
Service Occupations					
Marketing and Sales Occupations					
Administrative Support and Clerical Occupations					
Precision Production, Craft & Repair Occupations					
Production Occupations					
Operators, Fabricators and Laborers Occupations					

APPENDIX E. TECHNOLOGY CORRIDOR SKILLS 2010 SURVEY

**Technology Corridor
Skills 2010 Survey**

1. How are your current employee training programs being met?
 1. In-house
 2. External Vendors
 3. No training provided
 4. Other (please provide any explanation)
2. Does your company use any online training programs?
 1. Yes—**Go to next question**
 2. No—**Skip to Question #7**
3. If yes, which of the following do you use?
 1. Off-the shelf
 2. Customized
 3. Combination of the above
 4. Not Used
 5. Other (please explain)
4. What, if any, barriers are there to using online training?
 1. Technology
 2. Cost
 3. No personnel to oversee
 4. Other (please explain)
5. Do you use online training for specific skill areas?
 1. Yes
 2. No
6. In what areas do you use online training?
 1. Technical Training
 2. Soft Skills Training
 3. Other (please explain)
7. If No, what are the barriers to using online training?
 1. Technology
 2. Cost
 3. No personnel to oversee
 4. None
 5. Other (please explain)

The next two questions are related to hiring and the skill level of you current workforce.

8. What skill profiles are missing from your pool of applicants?

9. What skill profiles are missing from your current workforce?

10. What are the top three workforce factors impeding your ability to grow or expand in this region?
(Please rank if appropriate.)
 - 1.
 - 2.
 - 3.

The next two questions relate to your training and education needs from higher education in this region.

11. What education and training programs should Kirkwood Community College implement or expand to meet your skill profile needs?

12. Are you currently utilizing, or do you plan on utilizing internships?
 1. Yes—Go to question #13.
 2. No—Go to question #15.

13. What departments would utilize interns? (Please list)

14. Will you be using college or high school interns and how many?
 1. College _____
 2. High School _____

15. Are there any other comments you would like to share regarding workforce needs in this region?

Close

Thank you for meeting with me today. A representative of the Technology Corridor will be sending out the results of the survey to participants via email. If you would like to receive this report, I can take your email address. **(Capture email address)** We would also like to remind you to fill out the Skills 2010 Employee Information Survey and Informed Consent Form and fax it back to Kirkwood if you have not already done so. The number is 319-398-5432. Again, thank you for your participation.

APPENDIX F. STANDARD OCCUPATIONAL CLASSIFICATIONS

Executive, Administrative and Managerial Occupations

Executives

Advertising, Marketing, Public Relations and Sales Managers

Operations Specialties Managers—Administrative, CIS, Financial, HR Purchasing

Other Management Occupations

Professional Specialty Occupations

Business Operations Specialists

Financial Specialists

Computer and Mathematical

Architecture and Engineering

Life, Physical and Social Science

Community and Social Services

Legal

Education, Training and Library

Primary, Secondary and Other Education Teachers

Arts, Design, Entertainment, Sports and Media

Healthcare Practitioners and Technologists and Technicians

Service Occupations

Healthcare Support

Protective Service

Food Preparation and Serving

Building and Grounds Cleaning and Maintenance

Personal Care and Service—Entertainment, Transportation and Tourism, Child Care

Marketing and Sales Occupations

Supervisors, Sales Workers

Retail Sales Workers

Sales Representatives, Services

Sales Representatives, Wholesale and Manufacturing

Other Sales and Related Workers

Administrative Support and Clerical Occupations

Supervisors, Office and Administrative Support Workers

Communications and Equipment Operators

Financial Clerks

Information and Record Clerks:

Customer Service Representatives

Receptionists

Material Recording, Scheduling, Dispatching and Distributing Workers

Secretaries and Administrative Assistants

Other Office and Administrative Support Workers

Precision Production, Craft and Repair Occupations

Installations, Maintenance and Repair Supervisors and Workers

Electrical and Electronic Equipment Mechanics, Installers and Repairers

Vehicle and Mobile Equipment Mechanics, Installers and Repairers

Other Installers and Repairers:

Control and Valve

Industrial Machinery

Line

Precision Instrument and Equipment

Miscellaneous

Production Occupations

Supervisors, Production Workers

Assemblers and Fabricators

Food Processing Workers

Metal Workers and Plastic Workers

Printing Workers

Textile, Apparel and Furnishings Workers

Woodworkers

Plant and System Operators

Operators, Fabricators and Laborers Occupations

Transportation and Material Moving Occupations

Supervisors, Transportation and Material Moving Workers

Construction and Extraction Occupations

Construction and Extraction Supervisors

Brickmasons, Blockmasons and Stonemasons

Carpenters

Carpet, Floor and Tile Installers and Finishers

Cement Masons, Concrete Finishers and Terrazzo Workers

Construction Laborers

Construction Equipment Operators

Drywall Installers, Ceiling Tile Installers and Tapers

Electricians

Extraction Workers

Glaziers

Inspectors

Insulation Workers

Painters and paperhangers

Pipelayers, Plumbers, Pipefitters and Steamfitters

Roofers

Sheet Metal Workers

APPENDIX G. OCCUPATIONAL DATA BY INDUSTRY SECTOR

Clerical	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Advanced Manufacturing Bioprocessing/ Biotechnology	1,063	11%	110	6%	104	16%	214	8%
Consumer Products	7	0%	1	0%	1	0%	2	0%
Education	40	0%	10	1%	5	1%	15	1%
Government	5,031	54%	901	47%	325	50%	1,226	48%
Healthcare	206	2%	47	2%	8	1%	55	2%
Information Solutions	613	7%	190	10%	17	3%	207	8%
Logistics/ Distribution	1,942	21%	546	29%	135	21%	681	27%
Packaging/ Plastics	143	2%	31	2%	13	2%	44	2%
Printing	21	0%	4	0%	2	0%	6	0%
Trades	120	1%	57	3%	28	4%	85	3%
Other	3	0%	1	0%	0	0%	1	0%
Total	67	1%	9	0%	9	1%	18	1%
	9,256	100%	1,907	100%	647	100%	2,554	100%

Construction								
Advanced Manufacturing Bioprocessing/ Biotechnology	17	1%	6	2%	3	1%	9	2%
Consumer Products	0	0%	0	0%	0	0%	0	0%
Education	0	0%	0	0%	0	0%	0	0%
Government	402	30%	116	40%	0	0%	116	23%
Healthcare	66	5%	17	6%	1	0%	18	4%
Information Solutions	73	5%	31	11%	2	1%	33	6%
Logistics/ Distribution	0	0%	0	0%	0	0%	0	0%
Packaging/ Plastics	43	3%	26	9%	10	5%	36	7%
Printing	0	0%	0	0%	0	0%	0	0%
Trades	0	0%	0	0%	0	0%	0	0%
Other	635	47%	75	26%	200	90%	275	54%
Total	117	9%	17	6%	5	2%	22	4%
	1,353	100%	288	100%	221	100%	509	100%

Exec/Admin/Mngmt	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Advanced Manufacturing	1,736	41%	117	19%	110	34%	227	24%
Bioprocessing/ Biotechnology	21	0%	3	0%	0	0%	3	0%
Consumer Products	58	1%	13	2%	8	2%	21	2%
Education	976	23%	139	22%	50	15%	189	20%
Government	76	2%	29	5%	3	1%	32	3%
Healthcare	210	5%	43	7%	13	4%	56	6%
Information Solutions	868	20%	227	36%	84	26%	311	33%
Logistics/ Distribution	128	3%	19	3%	20	6%	39	4%
Packaging/ Plastics	45	1%	0	0%	1	0%	1	0%
Printing	43	1%	19	3%	29	9%	48	5%
Trades	4	0%	1	0%	0	0%	1	0%
Other	86	2%	12	2%	7	2%	19	2%
Total	4,251	100%	622	100%	325	100%	947	100%

Labor								
Advanced Manufacturing	32	4%	3	2%	4	9%	7	3%
Bioprocessing/ Biotechnology	0	0%	0	0%	0	0%	0	0%
Consumer Products	91	13%	4	2%	1	2%	5	2%
Education	201	28%	8	5%	7	16%	15	7%
Government	91	13%	4	2%	8	19%	12	5%
Healthcare	50	7%	21	12%	2	5%	23	10%
Information Solutions	1	0%	0	0%	0	0%	0	0%
Logistics/ Distribution	17	2%	3	2%	1	2%	4	2%
Packaging/ Plastics	34	5%	13	7%	9	21%	22	10%
Printing	144	20%	114	64%	8	19%	122	55%
Trades	0	0%	0	0%	0	0%	0	0%
Other	57	8%	7	4%	3	7%	10	5%
Total	718	100%	177	100%	43	100%	220	100%

Marketing/Sales	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Advanced Manufacturing	627	43%	103	27%	100	48%	203	35%
Bioprocessing/ Biotechnology	0	0%	0	0%	1	0%	1	0%
Consumer Products	31	2%	5	1%	6	3%	11	2%
Education	21	1%	2	1%	2	1%	4	1%
Government	0	0%	0	0%	0	0%	0	0%
Healthcare	16	1%	6	2%	3	1%	9	2%
Information Solutions	281	19%	83	22%	20	10%	103	18%
Logistics/ Distribution	469	32%	169	45%	74	35%	243	42%
Packaging/ Plastics	4	0%	0	0%	0	0%	0	0%
Printing	2	0%	0	0%	1	0%	1	0%
Trades	0	0%	0	0%	0	0%	0	0%
Other	9	1%	7	2%	3	1%	10	2%
Total	1,460	100%	375	100%	210	100%	585	100%

Precision								
Advanced Manufacturing	248	19%	40	16%	11	7%	51	13%
Bioprocessing/ Biotechnology	16	1%	4	2%	0	0%	4	1%
Consumer Products	14	1%	2	1%	4	3%	6	1%
Education	416	31%	54	21%	54	35%	108	27%
Government	57	4%	11	4%	2	1%	13	3%
Healthcare	32	2%	11	4%	1	1%	12	3%
Information Solutions	46	3%	5	2%	1	1%	6	1%
Logistics/ Distribution	409	31%	102	40%	65	42%	167	41%
Packaging/ Plastics	65	5%	19	8%	2	1%	21	5%
Printing	23	2%	5	2%	10	7%	15	4%
Trades	0	0%	0	0%	0	0%	0	0%
Other	12	1%	0	0%	3	2%	3	1%
Total	1,338	100%	253	100%	153	100%	406	100%

Production	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Advanced Manufacturing	7,590	88%	396	46%	520	66%	916	55%
Bioprocessing/ Biotechnology	62	1%	2	0%	4	1%	6	0%
Consumer Products	180	2%	50	6%	116	15%	166	10%
Education	5	0%	3	0%	2	0%	5	0%
Government	19	0%	5	1%	0	0%	5	0%
Healthcare	0	0%	0	0%	0	0%	0	0%
Information Solutions	118	1%	41	5%	0	0%	41	2%
Logistics/ Distribution	96	1%	39	5%	35	4%	74	4%
Packaging/ Plastics	473	5%	219	25%	110	14%	329	20%
Printing	121	1%	107	12%	2	0%	109	7%
Trades	0	0%	0	0%	0	0%	0	0%
Other	3	0%	0	0%	0	0%	0	0%
Total	8,667	100%	862	100%	789	100%	1,651	100%

Professional Specialties								
Advanced Manufacturing	8,800	37%	1,048	22%	1,006	42%	2,054	28%
Bioprocessing/ Biotechnology	23	0%	0	0%	2	0%	2	0%
Consumer Products	27	0%	6	0%	7	0%	13	0%
Education	10,327	43%	2,329	48%	990	42%	3,319	46%
Government	204	1%	28	1%	5	0%	33	0%
Healthcare	1,796	7%	796	16%	73	3%	869	12%
Information Solutions	2,457	10%	572	12%	245	10%	817	11%
Logistics/ Distribution	69	0%	23	0%	22	1%	45	1%
Packaging/ Plastics	0	0%	0	0%	2	0%	2	0%
Printing	2	0%	0	0%	0	0%	0	0%
Trades	7	0%	1	0%	0	0%	1	0%
Other	354	1%	53	1%	18	1%	71	1%
Total	24,066	100%	4,856	100%	2,370	100%	7,226	100%

Service	Current Employees	Pct of Current	Replacement Employees	Pct of Replacement	New Employees	Pct of New	New and Replacement	Pct New and Replacement
Advanced Manufacturing	3	0%	1	0%	2	1%	3	0%
Bioprocessing/ Biotechnology	0	0%	0	0%	1	0%	1	0%
Consumer Products	18	0%	6	0%	3	1%	9	0%
Education	3,293	52%	757	38%	182	51%	939	40%
Government	458	7%	74	4%	28	8%	102	4%
Healthcare	1,170	18%	624	31%	20	6%	644	27%
Information Solutions	179	3%	218	11%	73	20%	291	12%
Logistics/ Distribution	17	0%	7	0%	4	1%	11	0%
Packaging/ Plastics	2	0%	1	0%	0	0%	1	0%
Printing	0	0%	0	0%	0	0%	0	0%
Trades	0	0%	0	0%	0	0%	0	0%
Other	1,190	19%	327	16%	46	13%	373	16%
Total	6,330	100%	2,015	100%	359	100%	2,374	100%
Grand Total	57,439		11,355		5,117		16,472	

REFERENCES

- 21st Century Workforce Commission (June 2000). *A nation of opportunity building america's 21st century workforce.*
- American Council on Education, Business-Higher Education Forum. (2003).
Building a nation of learners.
- American Society for Training & Development. (2006, Fall). *Bridging the skills gap.*
Alexandria, VA: Author.
- Aspen Institute. (2003). *Grow faster together. Or grow slowly apart. How will America work in the 21st century?* Washington, DC. Author.
- Arney, M. J. & VanDerLinden, K.E. (2002). The institutional context of community college administration. *American Association of Community Colleges Research Brief. AACC, RB, 02, 3.*
- Bailey, T. & Gribovskaya. (1999). *Reassessing a decade of reform* (MDS-1197).
University of California, Berkley, National Center for Research in Vocational Education.
- Bailey, T. R. & Smith Morest, V. (2004, February). *The organizational efficiency of multiple missions for community colleges.* New York, NY: Teachers College, Columbia University.

Barton, P. E. (2000). *What jobs require: Literacy, education, and training, 1940-2006*.

Princeton, NJ: Educational Testing Service.

Black, S. E., & Lynch, L. M. (1996, May). Human-capital investments and productivity.

American Economic Review, 86, 263.

Business-Higher Education Forum. (1999, September). *Spanning the chasm: A blueprint*

for action. Washington, DC: Author.

Business-Higher Education Forum. (2003). *Building a nation of learners*. Washington,

DC: Author.

Carnevale, A. P., & Desrochers, D. (2001). *Help wanted...The community colleges in the*

knowledge economy. Annapolis Junction, MD: Community College Press.

Carnevale, A. P., & Desrochers, D. M. (2002). *The missing middle: Aligning education*

and the knowledge economy. Princeton, NJ: Educational Testing Service.

Carnevale, A. P. & Fry, R. A. (2001). *The economic and demographic roots of*

education and training. The Manufacturing Institute, Washington, DC.

Cedar Rapids MSA Labor Force Summary Linn County (2001). Retrieved July 31, 2007,

from <http://www.iowaworkforce.org/lmi/laborforce/etables/historic/areacr.txt>.

Checkland, P. & Holwell, S. (1998). Action Research: Its Nature and Validity. *Systemic*

Practice and Action Research, Volume 11, (Issue 1, Feb), p 9-21.

Council on Competitiveness. (1998). *Winning the skills race*. Washington, DC: Author.

Davenport, R. (2006, February). Eliminate the skills gap. *Training and Development*, 60, 26-31.

Dharavath, H. N., (2001). *Identification of the skills needed by workers in various segments of the mountain states graphic communications industry*. University of Wisconsin-Stout, Department of Communications, Education, and Training.

Fowler, D. & Chernus, K. (2005). The center of the web: workforce development partnerships. *Community College Journal*, 75, 6, 48-52.

Grubb, W. N., Badway, N., Bell, D., Bragg, D., & Russman, M. (1997). *Workforce, economic, and community development. The changing landscape of the entrepreneurial community college*. Berkley, CA: National Center for Research in Vocational Education, The University of California.

Gunderson, S., Jones, R., & Scanland, K. (2004). *The jobs revolution: Changing how America works*. Chicago, IL: Copywriters Incorporated.

Harmon, R. & MacAllum, K. (2003). *Documented characteristics of labor market-responsive community college and a review of supporting literature*. Washington, DC: US Department of Education Office of Vocational and Adult Education.

Hecker, D. E. (November 2001). Occupational employment projections to 2010. *Monthly Labor Review*.

- Heet, J.A. (2003). *Beyond workforce 2020: The coming (and present) international market for labor*. Indianapolis, IN. Hudson Institute.
- Herman, A. M. (1999). *Futurework, trends, and challenges for work in the 21st Century*. Washington, DC: United States Department of Labor.
- Heron, J. (1996). *Cooperative Inquiry: Research into the human condition*. London: Sage.
- Hult, M., and Lennung, S. (1980). Towards a definition of action research: A note and bibliography. *Journal of Management Studies* (17:2), 1pp. 242-250.
- Institute for Tomorrow's Workforce. (2007, January). *Quality education for all: A report to the Governor and the Iowa Legislature*.
- Iowa Department of Economic Development Annual Training Report (2007). *Introduction to Workforce Training*.
- Iowa Workforce Development. (2007). *Iowa's workforce and the economy*. Workforce Data and Business Development Bureau.
- Kirkwood at a Glance (2008). Retrieved June 14, 2007, from <http://www.kirkwood.edu/site/index.php?p=8296>.
- Kotamraju, P., Steuernagel, B., & Jacquart, M. (2002). *New program development strategy and supply/demand analysis: outcomes and occupational needs in Minnesota* (ED-99-CO-0160). Office of Vocational and Adult Education, Washington, DC.

Lederhandler, M. (2001) September 11, 2001: Post coverage on the worst terrorist attack on american soil, The Washington Post.

Levin, J. S. (2001). *Globalizing the community college*. New York, NY: Palgrave Publishers, Ltd.

National Academy of Sciences, National Academy of Engineering, and Institute of Medicine of the National Academies. (2006). *Rising above the gathering storm*, Washington DC: National Academies Press.

National Center on Education and the Economy. (1990). *America's choice: High skills or low wages*. Rochester, NY.

National Center on Education and the Economy. (2007). *Tough choices or tough times*. San Francisco, CA: Jossey-Bass.

National Commission on Excellence in Education. (1983). *A nation at risk*. Washington, DC: U.S. Government Printing Office.

Nielsen, N., Baird, D., Browning, B., & Milliron, M.(Eds). (2003). *Building a workforce system through partnering*. Phoenix, AZ: League for Innovation in the Community College.

O'Neil, H. F., Jr., & Others. (1992). *Measurement of workforce readiness: Review of theoretical frameworks*. Los Angeles, CA: National Center for Research on Evaluations, Standards, and Student Testing.

Occupational Projections 2004-2014 (2007). Retrieved June 14, 2007, from

www.iowaworkforce.org/lmi/occupations/projections/index.html.

Reason, P. & Bradbury, H. (Eds.) (2001) Handbook of Action Research: Participative

Inquiry and Practice, Sage: Thousand Oaks, CA.

Rey-Alicea, N., & Scott, G. (2007). *A survey of selected work readiness certificates*.

Boston, MA: Jobs for the Future.

Secretary's Commission of Achieving Necessary Skills. (June 1991). *What work requires*

of schools A SCANS report for America. Washington, DC: United States

Department of Labor.

Skills 2000 Commission (1998). *Skills 2000 Report*.

Smith, J.A. and Osborn, M. (2003) Interpretative phenomenological analysis. In J.A.

Smith (Ed.), *Qualitative Psychology: A Practical Guide to Methods*. London:

Sage.

The Conference Board. (2006). *Are they really ready to work? Employer's*

perspectives on the basic knowledge and applied skills of new entrants to the 21st

century U.S. workforce. New York, NY: Author.

The Cedar Rapids/Iowa City Technology Corridor Committee (2003, Fall). *Skills 2006:*

Assessment of employer's skill and employment needs

The Cedar Rapids/Iowa City Technology Corridor Committee (2008, Spring). *Skills 2010:*

Assessment of employer's skill and employment needs.

Washington State Board for Community and Technical Colleges (2005). *I-Best: A program*

integrating adult basic education and workforce training. (Research Report

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DEGREES AWARDED

Bachelor of Arts, Theater and Speech Communications, Simpson College

Master of Education, Higher Education (Community College Emphasis), Iowa State University

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PROFESSIONAL EXPERIENCE

2002 – Present	Vice President, Continuing Education & Training Services Kirkwood Community College, Cedar Rapids, IA
1998 – 2002	Executive Director, Continuing Education & Training Services Kirkwood Community College, Cedar Rapids, IA
1997 – 1998	Vice President, Existing Business Services, Priority One, a division of the Cedar Rapids Area Chamber of Commerce
1994 – 1996	Vice President, Membership Development Cedar Rapids Area Chamber of Commerce
1990 – 1994	Director of Admissions, Wartburg College

HONORS AND AWARDS

2007	National Scholars Honor Society
2006-2007	The National Dean's List
2005-2006	Phi Kappa Phi
2005-2006	<i>The Chancellor's List</i>
2005	Corridor Business Journal's Woman of Influence Award

2005	League for Innovation in the Community College “Innovator of the Year” Award
2004	Corridor Business Journal’s Top 25 Most Influential List
2000	YWCA Outstanding Honoree for Organizational Impact

PUBLICATIONS AND RESEARCH

Skills 2010 Technology Corridor Regional Employer and Training Survey—A mixed methods study to identify employer growth projections in industry sectors and training needs.

Skills 2006 Technology Corridor Regional Employer and Training Survey--A mixed methods study to identify employer growth projections in industry sectors and training needs.

Skills Advantage Research—A quantitative study documenting the foundational skills of incumbent workers to provide a regional benchmark.

Building a Workforce System Through Partnering, (2003) League for Innovation in the Community College. Edited by Norm Nielsen, Dee Baird, Boo Browning and Mark David Milliron.