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Workforce Preparedness of Information Systems Students: Perceptions of Students, Alumni, and Employers

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Workforce Preparedness of Information Systems Students:
Perceptions of Students, Alumni, and Employers

Workforce Preparedness of Information Systems Students:
Perceptions of Students, Alumni, and Employers

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Human Resource and Workforce Development Education

by

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Abstract

Employers of newly hired higher education graduates report their new workforce is not prepared. Further research was required to discover insights to the workforce readiness gap. This concurrent mixed methods study explored what competencies influenced employer's perceptions of the work-readiness of Information Systems (ISYS) undergraduate students and discovered ISYS graduates' and current ISYS students' perceptions of their work-readiness. Participants consisted of a convenience sample including 69 ISYS program upperclassmen, 20 ISYS program alumni, and 8 employers of the ISYS program graduates. ISYS program alumni completed an online Qualtrics survey to measure the participants' perception of their workforce preparedness. ISYS program upperclassmen completed a similar paper-based survey to measure the students' current perception of their workforce readiness. Employers of ISYS program graduates were interviewed to determine (1) how they defined workforce readiness, (2) the competencies associated with being workforce-ready, and (3) the degree to which the Sam M. Walton College of Business graduates demonstrated workforce readiness. The instrument used in this study was adopted from the employer survey used in the *Are They Really Ready to Work?: Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce* report by Casner-Lotto, Barrington, & Wright (2006) and the *Ill-Prepared U.S. Workforce: Exploring the Challenges of Employer-Provided Workforce Readiness Training* report by Casner-Lotto, Rosenblum, & Wright (2009). The reports were produced by ASTD, The Conference Board, Corporate Voices for Working Families, Partnership for 21st Century Skills, and SHRM.

Research findings demonstrated 91% of ISYS program alumni and 86.9% of upperclassmen believed they were adequately to well prepared for the workforce by the ISYS

program. Additionally, 75% of ISYS graduates' employers felt the students were adequately to somewhat well prepared for the workforce. Workforce readiness skills measured in this study included English Language (spoken), Writing in English, Problem Solving, Critical Thinking, Collaboration/Working with Others, Computer/Technical, Project Management, Knowledge within Major, General Business Knowledge, Willingness to Learn, Ability to Learn, Responsibility/Dependability, Initiative, Attitude Toward Work, Attendance/Punctuality, and Other skills not mentioned.

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Dedication

This dissertation is dedicated to my grandparents, John and Ola Mae Aubrey and John and Daisy Bristow. They are loved and missed greatly.

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Acknowledgements

Dedication

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Chapter I

Introduction

Status of the Issue

Employers report postsecondary students are not ready for the workforce (Casner-Lotto, Barrington, & Wright, 2006; Casner-Lotto, Rosenblum, & Wright, 2009; Schoeff Jr., 2009). A report from the commission appointed by former U.S. Secretary of Education Margaret Spellings states, “unacceptable numbers of college graduates enter the workforce without the skills employers say they need in an economy in which, as the truism holds correctly, knowledge matters more than ever” (U.S. Department of Education, 2006, p. x). To close the workforce readiness gap, many companies are requiring additional investments for training because new hires are not fully prepared to meet the companies’ expectations (Casner-Lotto et al., 2006; Casner-Lotto et al., 2009).

According to researchers, new hires lack soft or applied skills such as problem-solving, initiative, critical-thinking, teamwork and collaboration, and innovation (Casner-Lotto et al., 2006; Casner-Lotto et al., 2009; “Changing World,” 2012; McNamara, 2009; Schoeff Jr., 2009). Partnership for the 21st Century conducted a study in 2007 asking United States registered voters if skills such as critical thinking and problem-solving, computer and technology skills, and communications and self-direction skills would be essential for global economic competition for the United States in future years. Results indicated 99% of participating voters felt the skills would be essential (Partnership for the 21st Century Skills, 2007; Society for Human Resource Management [SHRM], 2008). Applied skills, for example problem solving, critical thinking, and leadership, were highly desired by many companies more than basic skills such as writing in English (Casner-Lotto et al., 2006; Casner-Lotto et al., 2009). Soft skills, such as adaptability,

self-confidence, and a strong work ethic, are exceedingly sought after skills (Lorenz, 2010). Between basic, soft, and applied skills, the incoming workforce has not met the mark in meeting employers' level of expectation (Casner-Lotto et al., 2009; McNamara, 2009). According to NACE (National Association of Colleges and Employers) in the *Job Outlook 2013 Spring Update* (2013), employers who responded to the annual survey believed verbal communication, decision making, problem solving, obtaining and processing information, prioritizing work, analyzing quantitative data, having job related technical knowledge, and computer software program efficiency are very to extremely important skills and qualities in new college hires. Bailey and Stefaniak (2000) conveyed verbal communication, listening, application of knowledge, problem solving, adaptability to technology changes, time management, multi-tasking abilities, adaptability to programming language changes, visualization/conceptualization skills, and teamwork skills as important specifically for the information technology profession.

This research study explored further the workforce readiness skills desired by employers and discovered the perceptions of current Information Systems (ISYS) upperclassman students, ISYS program alumni, and employers of ISYS program graduates regarding (ISYS) upperclassman students' workforce readiness.

Brief Background of Information Systems (IS) Requiring Specialized Skills and Study

The field of IS involves a balance of technical savvy and business know-how. A person in the IS career path functions as the liaison between the technology side of the business and the user, often solving business problems or creating opportunities with the tool of technology. The skills bridging the two sides are traditionally acquired in higher education (Hager, Holland, & Beckett, 2002; Topi, Valacich, Wright, Kaiser, Nunamaker, Sipior, and de Vreede, 2010). Programming knowledge, analysis capability, problem solving, and managing projects are some

of the skills and concepts learned in depth in higher education (Topi et al., 2010; University of Arkansas, 2013). Work in information systems or information technology fields also require adaptability and flexibility because the field is rapidly changing with the introduction of new technology and new business challenges (Bailey et al., 2000). The IS job listings available through the Razorback Career Link (2013) have common qualifications required such as: Bachelor degree, information systems education, verbal and written communication skills, the ability to work collaboratively, technical skills, interpersonal skills, organization skills, business knowledge, analytical and problem-solving skills, dependability, and leadership.

Typical IS careers include computer and information systems managers, computer programmers, computer support specialists, computer systems analysts, database administrators, information security analysts, software developers, and web developers. The Bureau of Labor Statistics at the U.S. Department of Labor (2012) reported that IS careers need a bachelor's degree as entry-level education except for the computer support specialist occupation. The computer support specialist occupation does require some college but not a degree for job entry. Furthermore, the competitive job market draws a higher importance on college degree candidates (MarksJarvis, 2012).

Statement of the Problem

Research has shown that many employers believe students graduating from college are not prepared to enter the workforce (AAC&U, 2010; Casner-Lotto et al., 2006; Casner-Lotto et al., 2009). Additional study was essential to determine how employers define, manage, and evaluate workplace readiness of ISYS undergraduate students.

Purpose of the Study

The purpose of this concurrent mixed methods study was to explore what competencies influence employer's perceptions of the work-readiness of ISYS undergraduate students and discover ISYS graduates' and current ISYS students' perceptions of their work-readiness. In the study, current ISYS advanced undergraduate students and ISYS program alumni data were surveyed to determine their workforce preparedness perceptions. Moreover, insights gained from ISYS program graduates' employers from interviews was used to identify employers' perceptions of the ISYS program students' workforce preparedness.

Significance of the Study

This study was significant because it provided a better understanding of how employers define and measure job readiness of recent ISYS program graduates. In addition, the study identified possible gaps between employer, current student, and alumni perceptions of graduates' job readiness which could be used to provide direction for future workforce preparation of ISYS undergraduate students.

IS enrollment numbers have been at their lowest ever since the fall out from the dot.com bubble and the outsourcing of IT related jobs overseas. IS departments have struggled to recruit and retain students into the IS field even now with an enormous growth in jobs available and more and more companies bringing their IT services back to the United States such as General Motors (Granger, Dick, Jacobson, & Van Slyke, 2008; Koch & Trower, 2011). IT jobs continue to be in abundance and the awareness and preparation of skills needed for the IS workforce is important to aid employment success (Wilkerson, 2012).

This study was intended for six audiences who will observe the importance of this research including future IS program majors, current IS program majors, current IS

undergraduate program employers, parents of current and future IS program students, IS program faculty, and University administrators. Workforce readiness contributes to the University's national rankings which is a significant benchmark of the quality of the degrees offered (Lavelle, 2012). Additionally, the workforce preparedness of graduating undergraduate students is a substantial component to the students' employability.

Research Questions

The research questions for this study were:

1. To what extent did University of Arkansas Information Systems advanced undergraduate students perceive themselves to be ready to enter the workforce?
2. To what extent did graduates of the University of Arkansas Information Systems bachelor's degree program perceive they were workforce ready upon graduation?
3. Were there differences between perceptions of workforce readiness by the upperclassmen undergraduate students and the alumni of the Information Systems bachelor's degree program?
4. How did employers who have hired the University of Arkansas Information Systems alumni describe these former students' workforce readiness upon entry into their positions?
5. Were there differences between perceptions of workforce readiness by Information Systems alumni employers, Information Systems upperclassman students, and alumni of the Information Systems bachelor's degree program?

Definition of Key Terms

Advanced undergraduate.

An advanced undergraduate is considered to be classified as a junior or senior in the program for the purposes of this study. Advanced undergraduate may be interchanged with upperclassman or upperclassmen.

Information systems.

Topi et al. (2010) define the academic field as incorporating two broad areas. The areas are:

- (1) acquisition, deployment, management, and strategy for information technology resources and services (the information systems function; IS strategy, management, and acquisition; IT infrastructure; enterprise architecture; data and information), and (2) packaged system acquisition or system development, operation, and evolution of infrastructure and systems for use in organization processes (project management, system acquisition, system development, system operation, and system maintenance). (Topi et al., 2010, p. 13).

Furthermore, the authors stated that IS's function was "to plan, develop or acquire, implement, and manage an information infrastructure of information technology (computers and communications), data (both internal and external), and enterprise-wide information processing systems" (Topi et al., 2010, p. 13). Tracking of new information technology as well as incorporating it into the organization's practices, strategy, and planning is also a responsibility of IS.

The curriculum of information systems at the University of Arkansas is designed and defined "to prepare graduates for careers in solving business problems with applications of computer technology" (University of Arkansas, 2013, "Information Systems (ISYS)," para. 1).

Perception.

According to the Oxford Dictionaries Online (2013), perception is “a way of regarding, understanding, or interpreting something; a mental impression” (para. 1).

Workforce preparedness or workforce readiness.

In this study, workforce preparedness and workforce readiness are interchangeable. For the purpose of this study, workforce preparedness or readiness refers to the level of aptitude for beginning employment.

Workforce readiness gap.

Workforce readiness gap is defined as the difference between the targeted and actual skills a new hire encompasses to be successful in the workplace (McNamara, 2009).

Chapter Summary

This first chapter presented the status of the issue, a brief background on the required skills and study for IS, the problem statement, the purpose and significance of the study, research questions, and definition of key terms. Workforce readiness is an ongoing issue for all three levels of education, high school, 2-year institutions, and 4-year institutions. This study focused on the ISYS program undergraduate students at a 4-year institution. The ISYS program students must be prepared with the necessary basic and applied skills to be employable and have the best chance for success in the workforce (Mantell, 2012; Wilkerson, 2012).

Chapter II

Literature Review

Introduction

This study examined perceptions of current ISYS students, ISYS program alumni, and employers of ISYS program undergraduate graduates towards ISYS program graduates' workforce preparedness. Literature reviewed for this study included the history of the incoming workforce and its readiness for work, the criteria of workforce readiness by other research studies, the IS workforce readiness history, the characteristics of the generation that is the current entering new workforce, government interventions to overcome the lack of workforce preparedness, higher education's efforts to develop the undergraduate students for the workforce, and workforce readiness action items. The literature posited that the issue of workforce readiness or preparedness as an ongoing challenge.

Workforce Readiness History

Workforce readiness, business and industry development, and education have had an integrated relationship since the beginning of public education in the United States (McNamara, 2009). Importance of workforce readiness has gained momentum and several governmental departments and agencies, councils, administrators of education, and public policies have turned a pinpointed focus on the issue (Benamati et al., 2010; McNamara, 2009; Rothman, 2012; Schoeff Jr., 2009; U.S. Department of Education, 2013; University of Arkansas Sam M. Walton College of Business George W. Edwards Jr. Career Center, 2013). Within the last two decades, the issue of workforce readiness has come into the spotlight especially as the baby-boomer generation begins to retire and the millennial generation begins to fill workforce gaps (Minton-Eversole, 2012; Patton, 2011).

Workforce Readiness Criteria and Studies

There are many research studies regarding the criteria associated with workforce readiness. However, there was limited research regarding the IS or Information Technology (IT) subject area. The most recent research for IS workforce readiness criteria can be found in 2010 (Benamati, Ozdemir, & Smith, 2010) followed by less recent research in 2002 (Paranto, 2002). However, the largest concentration of research addressing workforce readiness in the IS field occurred in 1993 and 1995 (Couger et al., 1995; Lee, Trauth, & Farwell, 1995; Todd, P. A., McKeen & Gallupe, 1995; Trauth, Farwell, & Lee, 1993).

As part of broader ongoing workforce readiness research, Landrum, Hettich, and Wilner (2010) conducted a study of Boise State University Department of Psychology alumni. The alumni were assessed in three areas: current level of preparedness in the workplace, level at graduation, and current level of competence. Alumni ranked the top 10 preparedness items that were expected in the workplace. They included:

1. Possess self-discipline, including punctual attendance and dependability.
2. Act responsibly and conscientiously.
3. Work well with others.
4. Meet the needs of others, such as clients or customers.
5. Set priorities and allocate time efficiently to meet deadlines.
6. Identify, prioritize, and solve problems.
7. Make defensible and appropriate decisions.
8. Possess the ability to work without supervision.
9. Work independently.
10. Manage several tasks at once (Landrum et al., 2010, pp. 99-100).

Additionally, the authors' research compared the alumni findings with workforce readiness desired characteristics from employers (Landrum et al., 2010). Listening skills, the ability to work in teams and with others, desire and willingness to learn and learn new skills, high quality customer service orientation, interpersonal skills, adaptability, problem-solving, and suggesting solutions for problems were the characteristics desired by employers (Landrum et al., 2010; Landrum & Harrold, 2003).

Warn and Tranter (2001) lead a study at the University of New South Wales using the Mayer Committee's seven key competencies for successful assimilation into the workforce and Yukl's taxonomy of managerial behavior. Participants were graduates from the Australian Defence Force Academy (ADFA) of the University. The study's purpose was to assess the graduates experience at the institution and how the institution had developed the competencies stated in the study. The competencies evaluated were collecting, analyzing, organizing, communicating, planning, teamwork, numerical, problem solving, technology, critical reflective thinking, consideration for others (leadership), and initiating structure (leadership).

The Business Higher Education Forum released a report in 2003 named "Building a Nation of Learners" (Beach, 2013). The report cited the new necessary skills required for the workplace and to compete in the 21st century. The skills included: leadership, teamwork, problem solving, time management, self-management, adaptability, analytical thinking, global consciousness, and basic communication.

In 2006, The Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, and the Society for Human Resource Management (SHRM) conducted a study of over 400 employers to gain insight of the workforce readiness of new hires (Casner-Lotto et al., 2006). The study also identified the basic and applied skills preferred by employers.

Basic skills followed core academic subjects such as reading, writing, and math identified by the No Child Left Behind Act of 2001. The applied skills and definitions were:

- Critical Thinking/Problem Solving – Exercise sound reasoning and analytical thinking; use knowledge, facts, and data to solve workplace problems; apply math and science concepts to problem solving.
- Oral Communications – Articulate thoughts, ideas clearly and effectively; have public speaking skills.
- Written Communications – Write memos, letters and complex technical reports clearly and effectively.
- Teamwork/Collaboration – Build collaborative relationships with colleagues and customers; be able to work with diverse teams, negotiate and manage conflicts.
- Diversity – Learn from and work collaboratively with individuals representing diverse cultures, races, ages, gender, religions, lifestyles, and viewpoints.
- Information Technology Application – Select and use appropriate technology to accomplish a given task, apply computing skills to problem-solving.
- Leadership – Leverage the strengths of others to achieve common goals; use interpersonal skills to coach and develop others.
- Creativity/Innovation – Demonstrate originality and inventiveness in work; communicate new ideas to others; integrate knowledge across different disciplines.
- Lifelong Learning/Self Direction – Be able to continuously acquire new knowledge and skills; monitor one’s own learning needs; be able to learn from one’s mistakes.
- Professional/Work Ethic – Demonstrate personal accountability, effective work habits, e.g., punctuality, working productively with others, and time and workload management.

- Ethics/Social Responsibility – Demonstrate integrity and ethical behavior; act responsibly with the interests of the larger community in mind (Casner-Lotto et al., 2006, p. 16).

The most important skills identified for four-year college graduates were professionalism, teamwork, and oral communication. The top five deficient applied skills recognized by employers within the study were written communications, leadership, professional/work ethic, creativity/innovation, and lifelong learning/self-direction (Casner-Lotto et al., 2006). A follow-up report by Corporate Voices for Working Families, American Society for Training & Development (ASTD), SHRM, and The Conference Board suggested training efforts be made by employers to fill the workforce readiness gap, and offered ideas concerning what businesses could do to improve workforce readiness (Casner-Lotto et al., 2009).

Information Systems Workforce Readiness History

The years 1993 to 1995 are prominent years when stakeholders of the Information Systems field came together to recognize a preparedness gap and a need for curriculum changes. Todd, McKeen, and Gallupe (1995) suggested three categories in which an IS professional should be prepared: (1) knowledge of information technology, (2) knowledge of business and its operations, and (3) knowledge of systems and approaches to systems problem-solving. Couger et al. (1995) posited the desired attributes of IS program graduates were communication, computer application systems, information technology and tools, interpersonal relationships, management, problem solving, systems development methodologies, systems theory and concepts, and professionalism. Trauth, Farwell, and Lee (1993) took a different approach and observed two perspectives, academic and industry, toward the workforce readiness expectation gap.

Trauth et al. (1993) stated that industry was critical of the workforce produced by academics because industry felt academia was teaching outdated and irrelevant technologies and programming languages. On the other hand, academia criticized industry for delivering mixed information regarding what skills should be obtained by the students. To add another level to the frustration, accreditation standards limited the flexibility of the curriculum. Trauth et al. (1993) conducted a study finding there was an expectation gap between industry's needs and incoming workforce abilities.

The Management Information Systems Department at Northern State University conducted a study to assess program quality and graduate employability (Paranto, 2002). Surveys were sent to organizations hiring graduates within the last five years and follow-up focus groups were conducted. Several skills were identified for improvement including: communication skills, real-world hands-on experiences, computer and technical skills, interview skills, international experience exposure, and awareness of civic duty. Paranto (2002) reported the actions taken by the university to address the deficient skills.

Benamati, Ozdemir, and Smith (2010) identified two studies in their research relating to the alignment of IS curricula and the needs of industry. In one study, business domain knowledge, project management, and client-facing tasks were stated to be important for entry level positions. The second study conveyed a shortfall in leadership, teamwork, collaboration, and communication skills by IS undergraduates. Benamati et al. (2010) suggested a solution of industry and academia continuing to work together to close the workforce readiness gap.

In 2010, Topi et al. revised the curriculum guidelines for undergraduate degree programs in IS. Re-evaluation of the curriculum was necessary to stay current with the rapidly changing field and technology. The researchers created three categories of knowledge and skills necessary

for the field: (1) IS specific knowledge and skills, (2) foundational knowledge and skills, and (3) domain fundamentals. IS specific knowledge and skills encompassed identifying and designing IT-enabled organization-wide improvements, analyzing trade-offs, managing IT operations, and designing and implementing IS solutions (Topi et al., 2010). Foundational knowledge and skills was comprised of skills such as leadership, collaboration, critical thinking, and communication. Domain fundamentals consisted of general models, key specializations, and performance evaluation within a domain (Topi et al., 2010).

Millennial Generation

The Millennial Generation, those persons born approximately between 1976 and 2001, is the generation representing the majority of the incoming workforce. McNamara (2009) asserts the millennial generation is providing businesses the most challenge regarding workforce readiness. Millennials are singled-out specifically for the lack of soft skills (Rossheim, 2013). The generation has a different work style than most business's work methodology. Spiegel (2010) reports millennials "require clear direction, guidance and goals from their managers" (para. 2). This new workforce generation is accustomed to scoring rubrics for assignments with continual feedback and discussion. This is in contrast to today's workplace where there is much more ambiguity and autonomy. To address the training needs of this new generation larger employers are moving towards training that uses technology such as simulations and avatar instructors (McNamara, 2009).

Government Intervention

For the last 20 years, government intervention has taken place to help combat the workforce readiness gap (McNamara, 2009). Laws, goals, and guidelines have had little impact. A directive was established in 1990 for higher education to maximize workforce readiness by the

year 2000 (McNamara, 2009). Under the George W. Bush Administration, No Child Left Behind legislation was enacted to shift educational accountability and individualized instruction to the learner (McNamara, 2009; U.S. Department of Education, 2013). The William Jefferson Clinton Administration enacted the Workforce Investment Act in 1998 to support U.S. workforce development and preparedness (Schoeff Jr., 2009). The Act is in the process of reauthorization. During the reauthorization process substantial importance has been placed and stated concerning the collaboration between government, educational institutions, and employers to identify the skills needed for regional economies (Schoeff Jr., 2009).

A more recent initiative has been the development of common core state standards for elementary and secondary education. In 46 states and the District of Columbia, new common core state standards have been adopted to help combat the lack of workforce preparedness (Rothman, 2012). This effort began in 2006 and was named the Common Core State Standards Initiative (CCSS). April 2009 was the launch date for the CCSS. Standards for college and career readiness are also in the development stages.

Approach by Universities

According to Benamati et al. (2010) 69% of the higher education institutions with IS programs studied have made curriculum changes to help close the workforce readiness gap. Conversely, there are some institutions that have not changed and do not plan to do so. Courses being added are managerial in scope as opposed to technical and technical courses are more often being dropped. Project management and design are focused more heavily than programming (Benamati et al., 2010).

The University of Arkansas Sam M. Walton College of Business George W. Edwards Jr. Career Center has implemented several initiatives to help prepare students for the workforce and

bridge the gap. The introduction of the Leadership Walton Program in 2007 was designed to fill “the gap between academic pursuits and workforce preparation” (University of Arkansas Sam M. Walton College of Business George W. Edwards Jr. Career Center, 2013). The Program’s mission is to blend academic, leadership, and career development opportunities helping to guide students toward lifelong professional success. Additionally, the Center provides an academic course named “From Books to Boardrooms” which examines the necessary skills to be successful as a professional in the workforce. Skills such as enhancing business communications, networking, and workplace success skills are covered in the course. Provided on the Center’s website is a “Life After College” page which gives insight to what to expect during the first 100 days on the job and tips for making the college to work transition.

Workforce Readiness Action Items

At a Society of Human Resource Management (SHRM) symposium held in November 2007, an executive roundtable and participant discussion suggested several action items for moving forward with workforce readiness preparation such as

- Create a coalition of key business organizations to form principles and a direction for workforce readiness;
- State specific workforce skills and competencies required by employers;
- The U.S. government should invest in teacher retraining;
- The U.S. government should learn from workforce readiness programs that have proven successful to facilitate best practices;
- Create new models of education;

- Incorporate large-scale programs that infuse soft skills and the business world needs with skills taught;
- Require a longer school year (2008).

In the collaborative report by Corporate Voices for Working Families, ASTD, SHRM, and the Conference Board, suggestions for what businesses could do to help improve workforce readiness were made (Casner-Lotto et al., 2009). Some of the suggestions included communicating with the public to identify the basic and applied skills needed and participate with educators to develop workforce readiness skills through mentorship programs, internships, and additional learning opportunities.

Chapter Summary

From the literature, workforce readiness has been a concern for a long length of time with minimal results for improved readiness. The applied skills necessary for the workforce have a common theme throughout the literature with communication skills, critical thinking and problem solving, self-management, and collaboration being the most cited. Action has commenced with federal legislation, initiatives, and higher education attention. There was a significant amount of research regarding workforce readiness at all education levels including secondary education and post-secondary education. Conversely, a limited amount of research was available for the information systems and information technology post-secondary workforce preparedness. There were pockets of information systems and information technology attention in the early 1990's and most recently 2010. This study concentrated on the present workforce readiness of ISYS program graduates.

Chapter III

Methodology

Introduction

The purpose of this study was to examine the perceptions of current ISYS upperclassman students, ISYS program alumni, and employers of ISYS program graduates in relation to ISYS program graduates' workforce preparedness. A concurrent mixed methods research design was used to conduct this study. Concurrent mixed methods design was appropriate according to Creswell (2009), because both quantitative and qualitative data will be used to provide a comprehensive analysis of this research. According to Trochim and Donnelly (2008), qualitative research is an approach when the researcher wants to attain a deeper understanding of the issues. The qualitative data collected from the employers of ISYS program graduates contributed to the holistic analysis of the study. The research questions that guided this concurrent mixed methods study were:

1. To what extent did University of Arkansas Information Systems advanced undergraduate students perceive themselves to be ready to enter the workforce?
2. To what extent did graduates of the University of Arkansas Information Systems bachelor's degree program perceive they were workforce ready upon graduation?
3. Were there differences between perceptions of workforce readiness by the upperclassmen undergraduate students and the alumni of the Information Systems bachelor's degree program?
4. How did employers who have hired the University of Arkansas Information Systems alumni describe these former students' workforce readiness upon entry into their positions?

5. Were there differences between perceptions of workforce readiness by Information Systems alumni employers, Information Systems upperclassman students, and alumni of the Information Systems bachelor's degree program?

There were sixteen variables that formed three constructs representing a formative measurement. A formative measurement is used because according to Hair, Black, Babin, Anderson, & Tatham (2006) the measured variables cause the construct. The variables were adapted from the model instrument used in this study and discussed in the Instrumentation section of this chapter. The sixteen variables were English Language (spoken), Writing in English (grammar, spelling, etc.), Problem Solving, Critical Thinking, Collaboration/ Working with Others, Computer/Technical, Project Management, Knowledge within Major, General Business Knowledge, Willingness to Learn, Ability to Learn, Responsibility/Dependability, Initiative, Attitude Toward Work, Attendance/Punctuality, and Other.

Participants

There were three segments of participants for this study; current Spring 2013 upperclassman ISYS program students, ISYS program alumni starting from 2009 to 2012, and current employers of the ISYS program alumni. The three segments represented convenience samples and the three perceptions studied in this research of workforce readiness. Junior and senior level classes of the ISYS program were identified to reach the current upperclassman ISYS program students' population representing one group of this study. There were 135 juniors and seniors enrolled in the ISYS program. Of the 135 students, 69 students or 51% completed a paper-based survey for this research study. The second perception group, ISYS program alumni from May 2009 to December 2012, was identified to participate in this study with the assistance of the Arkansas Alumni Association. This time span was applied to have a brief amount of time

between graduation, new hire start date, and the current date of completing the survey. The population of this study's time span was 122 alumni. Of the 122 alumni completing the online survey, 58 responses were received with 20 or 16% as complete responses. The third perception group, employers of ISYS program graduates, was identified with the assistance of the Sam M. Walton College of Business George W. Edwards Jr. Career Center at the University of Arkansas through archived scrubbed data. The data were scrubbed of identifying factors to maintain confidentiality of ISYS program alumni. The data distinguished companies that have hired ISYS program graduates as reported by the ISYS program graduating seniors. Eleven employer companies were requested to participate in the study. Eight interview responses were received from 4 employer companies. Because this study used samples of convenience, the study exceedingly restricted generalizability of the results (Pyrszak & Bruce, 2007).

Each of the study's participants was given a University Institutional Research Review Board approved implied or informed consent form (See Appendix A for IRB Approval documentation). The ISYS program students and alumni forms reported that the research concerned perceptions of workforce readiness by current students and alumni, participation was voluntary, and the participants had the right to withdraw at any time. An implied or informed consent was obtained by all the participants of this study. The employers of ISYS graduates informed consent form reported that the research was to determine how the employers defined workforce readiness, the competencies the employers felt are associated with being workforce-ready, and the degree to which the Walton College ISYS graduates demonstrate workforce readiness. Employers were informed that participation was voluntary and they had a right to refuse participation and to withdraw at any time. Confidentiality was addressed on both forms stating that all information gained from the survey or interview would be kept confidential to the

extent allowed by law and University policy. Survey and interview responses were given alphanumeric codes for data analysis and to protect participants' identities.

Instrumentation

The instrument used in this study was adapted from the employer survey used in the *Are They Really Ready to Work?: Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce* report by Casner-Lotto et al. (2006) and the *Ill-Prepared U.S. Workforce: Exploring the Challenges of Employer-Provided Workforce Readiness Training* report by Casner-Lotto et al. (2009). The reports were produced by ASTD, The Conference Board, Corporate Voices for Working Families, Partnership for 21st Century Skills, and SHRM. The report currently has 168 citations according to Google Scholar. This instrument was used with permission. The instrument was the foundation for the ISYS Program upperclassman students and alumni surveys and the employers' of ISYS Program graduates interview questions. Questions related to high school graduates, GED, two-year college, and technical graduates from the instrument were not used. Questions that could be applied to all three perception groups were utilized. Mixed methods instruments were utilized so the results from the quantitative and qualitative questions would reinforce each other (Creswell, 2009; Creswell & Plano Clark, 2007).

ISYS program upperclassman instrument.

The ISYS program upperclassman survey was used to receive data regarding the workforce readiness level as perceived by the upperclassman students. The paper-based survey was disseminated once to three junior and senior level ISYS classes during the first 15 minutes of the class period in the month of February 2013. Two parts were contained within the survey; part I for background information and part II related to workforce development skills questions

(See Appendix B). Part I's first and second questions asked the student about his or her classification and the semester currently attending for the classification. The student self-selects (1) Junior or (2) Senior for the classification question and (1) 1st, (2) 2nd, or (3) Other with an explanation space for the semester designation. Question three of Part I inquired which degree concentration the student was pursuing, (1) Enterprise Resource Planning (ERP), (2) Enterprise Systems, or (3) IT Applications.

Part II of the students' survey asked four questions. The first question was an open-ended question asking the skills the student expected to obtain at the completion of the ISYS program. The question assessed the students' perceptions of how prepared they were in sixteen different workforce skills based on their ISYS program experience. The sixteen skills were the same used in the alumni online survey. This question used a Likert scale of 1 = Not Prepared, 2 = Somewhat Not Prepared, 3 = Adequately Prepared, 4 = Somewhat Well Prepared, and 5 = Well Prepared. Question three was an open-ended question that queried the students with what concerns they had about being workforce ready. The last question requested an overall rating for the workforce preparedness by the ISYS program. Students were to choose one of the following options: Not Prepared, Somewhat Not Prepared, Adequately Prepared, Somewhat Well Prepared, and Well Prepared. This instrument was applied to answer research questions two, three, and five.

ISYS program alumni instrument.

The ISYS program alumni mixed methods online survey was an instrument to collect data regarding the alumni's workforce readiness level perception at the time of post-graduation employment. The online survey was created through the software Qualtrics and disseminated by the Arkansas Alumni Association in the month of March 2013. The online survey was created

with two parts; part I for background information and part II related to workforce development skills questions (See Appendix C). Part I's first question asked the student which degree concentration he or she pursued while pursuing the ISYS program degree. Options were (1) Enterprise Resource Planning (ERP), (2) Enterprise Systems, or (3) IT Applications.

Part II of the alumni survey asked four questions. The first question was an open-ended question asking the skills the student expected to obtain at the completion of the ISYS program. The second question assessed the alumni's perception of how prepared they were in sixteen different workforce skills based on their ISYS program experience. The sixteen skills selected are based on the skills in the *Are They Really Ready to Work?: Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce* report by Casner-Lotto et al. (2006) and the *Ill-Prepared U.S. Workforce: Exploring the Challenges of Employer-Provided Workforce Readiness Training* report by Casner-Lotto et al. (2009). This question used a Likert scale of 1 = Not Prepared, 2 = Somewhat Not Prepared, 3 = Adequately Prepared, 4 = Somewhat Well Prepared, and 5 = Well Prepared. Additionally, the question was common amongst all instruments of each of the three participant groups. For this question, two of the three participant group responses had the same Likert scale and the third participant group used a dichotomous scale.

Question three requested the alumni to rank the top five workforce skills presented in question two based on the skill's essentialness to workforce readiness. A ranking of 1 indicated the highest, most essential skill. The last question examined an overall rating for the workforce preparedness by the ISYS program. Alumni were to choose one of the following options: Not Prepared, Somewhat Not Prepared, Adequately Prepared, Somewhat Well Prepared, and Well Prepared. This instrument was applied to answer research questions one, three, and five.

Employers of ISYS program graduates instrument.

The employers of ISYS graduates qualitative interview was used to collect data regarding the workforce readiness level as perceived by employers. Interviews were conducted March 2013 through May 2013. The employers' qualitative interviews consisted of eight questions related to workforce development skills (See Appendix D). There were six open-ended questions and two Likert scale questions. The first question was an open-ended question asking the employer's expectations for ISYS program graduates. The second and third questions were open-ended and asked what skills were adequately and not adequately prepared by the ISYS program graduates. The fourth question assessed the employer's perception of the need for training in sixteen different workforce skills. The sixteen skills were the same utilized in the student and alumni surveys. This question used a dichotomous response of 1 = High Need and 2 = Low Need to assess the training need of those skills. Question five was an open ended question that requested examples of success related to workforce readiness of new hires. Question six and seven asked about the observed workforce readiness skill gap and the challenge to address it, respectively. The last question examined an overall rating for the workforce preparedness of the new hires by the ISYS program. Employers were to choose one of the following options: Not Prepared, Somewhat Not Prepared, Adequately Prepared, Somewhat Well Prepared, and Well Prepared. One interview was conducted over the phone and seven e-mail interviews took place. There were a total of eight interviews completed. This instrument was applied to answer research questions four and five.

An exploratory factor analysis (EFA) was carried out to determine if there was interdependence among the workforce readiness variables contained in the instruments (Hair et al., 2006). The EFA was examined to analyze any patterned relationships in the responses and to

determine factors derived from the statistical results. SAS and SPSS software were applied to perform the factor analysis. All three instruments (ISYS Program Alumni survey, current IS Program Upperclassman Survey, and Employers of ISYS Program Graduates Interview) used the same sixteen variables in this study. The overall exploratory factor analysis is provided in Table 1. The factor analysis was performed several times with multiple rotation methods to have clear distinctions of the factors. The Other variable was removed because of its possible diverse responses.

Table 1

Factor Analysis of Variables

Variable	Factor 1	Factor 2	Factor 3
Willingness to Learn	.870	.408	.420
Ability to Learn	.819	.541	.398
Collaboration/Working with Others	.782	.245	.284
Responsibility/Dependability	.781	.500	.420
Attitude Towards Work	.735	.553	.451
Initiative	.654	.598	.537
Computer/Technical	.346	.841	.260
Knowledge within Major	.315	.824	.235
Problem Solving	.523	.806	.343
Critical Thinking	.492	.745	.538
Project Management	.521	.719	.251
Writing in English (grammar, spelling, etc.)	.400	.320	.946
English Language (spoken)	.454	.337	.928

Note. Partial correlations > .50 are in bold face. “Values greater than +/- .50 are generally considered necessary for practical significance” (Hair et al., 2006, p. 129). Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization. Rotation converged in 5 iterations.

Factor analysis summary.

After conducting the factor analysis for the workforce readiness skills and their relationships, a few themes and observances emerged. The Attendance/Punctuality and General Business Knowledge variables were removed because of low loadings.

Responsibility/Dependability and Knowledge within Major could be assumed to include Attendance/Punctuality and General Business Knowledge respectively. Eigenvalues were 6.007, 1.622, and 1.261 respectfully to Factors 1, 2, and 3. Constructs were formed from the factor analysis outcome. The constructs were personal traits, IS core competencies, and communication skills.

The personal traits construct consisted of the Willingness to Learn, Ability to Learn, Collaboration/Working with Others, Responsibility/Dependability, Attitude Towards Work, and Initiative variables. Computer/Technical, Knowledge within Major, Problem Solving, and Critical Thinking variables formed the IS core competencies construct. The communication skills construct was made from the Writing in English and English Language variables.

Instrument validity.

Before the request for Institutional Review Board approval and dissemination of the surveys and interview questions, the content validity of the instruments were examined by research experts. Additionally recruiters and college career placement experts were asked to examine the instruments for content validity. The feedback from the three groups were integrated into the three instruments and the instruments were verified for content validity.

Data Analysis

For each research question, SAS and SPSS was utilized to process the descriptive statistics and frequency analysis. A T-test was completed to find any differences between the

means of the ISYS upperclassmen and alumni perceptions for each of the variables and also for the overall perception of workforce readiness. A T-test was completed to find any differences for the overall perception of workforce readiness between the ISYS upperclassmen and the employers of ISYS graduates as well as between ISYS alumni and the employers of ISYS graduates. Moreover, an ANOVA was run to verify the outcomes of the t-tests.

Research Question One: To what extent did University of Arkansas Information Systems advanced undergraduate students perceive themselves to be ready to enter the workforce? The data from the open-ended question regarding skills expected to obtain was analyzed for trends in the responses. Descriptive statistics including mean scores and standard deviations were measured for the sixteen variables related to workforce development skills. Moreover, a frequency analysis was completed for each of the variables to analyze tendencies. For the open-ended question pertaining to concerns for workforce readiness, common themes were observed of the data. Descriptive statistics of the overall assessment of workforce preparedness by the ISYS program for ISYS program upperclassman were completed.

Research Question Two: To what extent did graduates of the University of Arkansas Information Systems bachelor's degree program perceive they were workforce ready upon graduation? The data analysis for this research question followed a similar pattern to the first research question. The data from the open-ended question regarding skills expected to obtain were analyzed for response trends. Descriptive statistics including mean scores and standard deviations and a frequency analysis were measured for the sixteen variables related to workforce development skills. A frequency analysis for the ranking of workforce readiness skills was conducted. Rounding out research question two's data analysis, descriptive statistics of the

overall assessment of workforce preparedness by the ISYS program for the alumni were observed and analyzed.

Research Question Three: Were there differences between perceptions of workforce readiness by the upperclassmen undergraduate students and the alumni of the Information Systems bachelor's degree program? With respect to this research question, common and differing themes were examined. Descriptive statistics were run for the sixteen variables and the three constructs related to workforce development skills. Furthermore an ANOVA was run to test for statistical significant differences of the means between the upperclassmen and alumni perceptions. An overall t-test was conducted to observe any difference in the overall assessment of workforce preparedness.

Research Question Four: How did employers who have hired the University of Arkansas Information Systems alumni describe these former students' workforce readiness upon entry into their positions? Shared and divergent themes were analyzed for the first, second, third, fifth, sixth, and seventh questions on the employers of ISYS program graduates interview outline. Descriptive statistics and frequency analysis were performed for the question related to workforce readiness skill training. Descriptive statistics were also completed for the overall preparedness rating of the ISYS program new hires.

Research Question Five: Were there differences between perceptions of workforce readiness by Information Systems alumni employers, Information Systems upperclassman students, and alumni of the Information Systems bachelor's degree program? Common and opposing themes were observed in all similar and related questions across all three instruments. Two t-tests were completed to discern any statistical significant differences in the overall assessment of the workforce preparedness by the ISYS program.

Chapter Summary

This chapter presented the concurrent mixed methods design for the study. The model instrument was identified that was the basis for the three participant groups' instruments. The participants of this study were indicated to establish the three perceptions of workforce preparedness analyzed. The study's instruments were discussed in detail indicating the quantitative and qualitative questions implemented. An exploratory factor analysis was conducted on the common sixteen variables related to workforce readiness and the results were provided. Instrument validity was presented in addition to the data analysis for all instruments.

Chapter IV

Results and Discussion

Introduction

Workforce preparedness is critical to the success of the incoming workforce and the employers hiring the workforce. The concept also contributes to the survival of higher education programs. The purpose for completing this study was to understand the perceptions of workforce preparedness by ISYS program upperclassmen, alumni, and employers of ISYS program graduates. The study provided new insights to workforce preparedness skills achieved by ISYS program graduates.

Research Question One Results and Discussion

Research question one was addressed: To what extent did University of Arkansas Information Systems advanced undergraduate students perceive themselves to be ready to enter the workforce? The first open-ended question of the ISYS program upperclassman instrument established the skills expected to be obtained at the completion of the ISYS Program. This provided a foundation for the ISYS program upperclassman perception. The question had varied responses. The top five most popular skill expectations were programming languages, Enterprise Resource Planning (ERP), project management, database administration, and general knowledge of the field of IS. An interesting observation was very few students mentioned any of the sixteen skill variables measured in the instrument. Communication skills, problem solving, critical thinking, teamwork, and technical skills were among those mentioned of the variables with limited frequency out of 69 responses. This was a contrasting observance of important workforce readiness skills according to the literature (Benamati et al., 2010; Casner-Lotto et al., 2006; Couger et al, 1995; Paranto, 2002; Todd et al., 1995).

Descriptive statistics were compiled for the sixteen workforce readiness skill variables.

Table 2 provides the descriptive statistic data.

Table 2

Descriptive Statistics of ISYS Program Upperclassman Survey Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
English Language (spoken)	69	1	5	4.45	.900
Writing in English (grammar, spelling, etc.)	69	1	5	4.16	1.024
Problem Solving	69	1	5	4.03	.840
Critical Thinking	69	1	5	3.94	.906
Collaboration/Working with Others	69	2	5	4.49	.740
Computer/Technical	69	1	5	3.54	1.051
Project Management	69	2	5	3.58	.812
Knowledge within Major	69	2	5	3.71	.956
General Business Knowledge	69	2	5	4.00	.822
Willingness to Learn	69	2	5	4.48	.779
Ability to Learn	69	2	5	4.39	.732
Responsibility/Dependability	69	2	5	4.46	.778
Initiative	69	2	5	4.07	.846
Attitude Towards Work	69	2	5	4.28	.820
Attendance/Punctuality	69	3	5	4.52	.633
Other	9	1	5	3.33	1.581

Note. The top five measures that are perceived to be the most prepared are in boldface.

According to the ISYS program upperclassmen, all sixteen measures were Adequately,

Somewhat Well Prepared, or Well Prepared within the ISYS program based on the mean values.

The Other, Computer/Technical, and Writing in English measures have the most deviation from the mean. Attendance/Punctuality, Collaboration/Working with Others, Willingness to Learn, Responsibility/Dependability, and English Language measures were reported to be the most prepared skills within the ISYS Program. A frequency analysis of the sixteen variables was completed to determine trends, which skills were perceived to be incorporated in the Program, and which skills needed coverage improvement (Table 3).

Table 3

Frequency Analysis of ISYS Program Upperclassman Workforce Readiness Skills Responses

Variable	N	Frequency	Percentage
English Language (spoken)	69	57	83%
Writing in English (grammar, spelling, etc.)	69	54	78%
Problem Solving	69	53	77%
Critical Thinking	69	48	70%
Collaboration/Working with Others	69	61	88%
Computer/Technical	69	35	51%
Project Management	69	38	55%
Knowledge within Major	69	41	59%
General Business Knowledge	69	50	72%
Willingness to Learn	69	51	74%
Ability to Learn	69	63	91%
Responsibility/Dependability	69	59	86%
Initiative	69	53	77%
Attitude Towards Work	69	59	86%
Attendance/Punctuality	69	64	93%
Other	9	4	44%

Note. Frequency was based on those responses that were Somewhat Well Prepared (4) to Well Prepared (5). Measures with > 90% frequency are in boldface.

Two measures, Attendance/Punctuality and Ability to Learn, were the measures with the highest frequency of Somewhat Well Prepared and Well Prepared skills. Apart from Other, the Computer/Technical skill was the least frequent skill of Somewhat Well Prepared and Well Prepared. A workforce readiness concerns open-ended question was asked of the ISYS

upperclassmen students. Common themes included having the proper skill set for the workforce, programming skills, and technical skills. Having the proper skill set dominated concerns by the ISYS program upperclassmen. Concerns from students had a great deal of variety. Students were concerned they did not have enough knowledge to join the workforce smoothly.

Student participant 9: The concerns that I currently have are that I just don't feel as if I know everything that I should. I almost feel like I'm learning, but yet not (not able to apply).

Student participant 17: My concerns are that I don't have the ability to jump right into industry work. I have a broad cloud level understanding of ISYS.

Student participant 26: Having the knowledge and skills to excel in the work force.

Student participant 48: I feel that a lot of our time is spent taking courses because we have "university requirements" instead of courses relevant to our major. This creates large gaps in our area of study. I feel that I don't know as much as I could after 4 years because of this.

There were concerns related to technical and skills needed for the job also.

Student participant 29: Lack of technical knowledge.

Student participant 35: That I do not know enough technical information.

Student participant 44: The program has a lack of focus on writing and communication, though every job description prioritize [sic] this skill highly.

Student participant 50: Not enough programming/database skills. I wish programming courses could be taken early since they require time to fully understand.

Students were also concerned about the job market and networking.

Student participant 60: I feel like I will not have enough connections or enough things to put on my resume to make me stand out. Basically, I feel like I will have the skills, but it may be harder to actually get hired. I don't really know.

Student participant 68: I am more concerned with finding a job rather than being good at it. Learning the systems through training and experience does not intimidate me. SAP was easy enough to learn and thanks to Business Apps I'm getting a basis for coding.

The overall workforce preparedness perception by the ISYS program upperclassman students was measured and the frequency analysis and descriptive statistics were performed. Results may be found in Table 4.

Table 4

Frequency Analysis and Descriptive Statistics of ISYS Program Upperclassmen's Perception of Their Overall Workforce Preparedness by the ISYS Program

Variable	Frequency Analysis		Descriptive Statistics	
	Responses	Percentage	Statistic	Value
Not Prepared	1	1.4%	Min Value	1
Somewhat Not Prepared	8	11.6%	Max Value	5
Adequately Prepared	18	26.1%	Mean	3.59
Somewhat Well Prepared	33	47.8%	Median	4
Well Prepared	9	13.0%	Variance	.833
Total	69	99.9%	Standard Deviation	.913

Note. Percentages did not add up to 100% due to rounding.

Overall the ISYS program upperclassmen felt the ISYS program is adequately preparing students for the workforce.

Research Question Two Results and Discussion

Research question two addressed: To what extent did graduates of the University of Arkansas Information Systems bachelor's degree program perceive they were workforce ready upon graduation? For the first open-ended question from the ISYS program alumni instrument, expected workforce readiness skills obtained at the completion of the ISYS Program was ascertained. There were five frequent skills mentioned. They were programming basic skills, project management, general business knowledge, technical skills, and database design. These skills would be expected for an IS degree. Problem solving and communication, two of the

sixteen workforce readiness measures, were reported. There were no reported unique skills expected from the IS program upperclassmen. For question two, the sixteen measures of workforce readiness descriptive statistics were compiled (Table 5).

Table 5

Descriptive Statistics of ISYS Program Alumni Survey Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
English Language (spoken)	20	1	5	4.05	1.356
Writing in English (grammar, spelling, etc.)	20	1	5	3.85	1.348
Problem Solving	20	3	5	4.15	.813
Critical Thinking	20	2	5	4.05	.999
Collaboration/Working with Others	20	3	5	4.60	.681
Computer/Technical	20	2	5	3.40	.883
Project Management	20	1	5	3.40	1.231
Knowledge within Major	20	2	5	3.65	.988
General Business Knowledge	20	3	5	4.10	.788
Willingness to Learn	20	3	5	4.50	.607
Ability to Learn	20	3	5	4.50	.688
Responsibility/Dependability	20	3	5	4.15	.745
Initiative	20	2	5	4.05	.887
Attitude Towards Work	20	3	5	4.15	.813
Attendance/Punctuality	20	1	5	4.05	1.099
Other	20	1	5	2.65	1.565

Note. The top three measures that were perceived to be the most prepared are in boldface.

The ISYS program alumni reported that all sixteen measures, with the exception of the Other measure, were Adequately to Well-Prepared skills. Eleven measures out of the sixteen rankings were in the Somewhat Well Prepared category. Collaboration/Working with Others scored the highest mean. This was expected due to the regularity of team based projects in the major classes. The Other, Writing in English, English Language, Project Management, and Attendance Punctuality measures had the greatest standard deviations from the mean. Justification for the measures with the largest standard deviation could be because these measures are related to the individual nature of the student. The open-ended response to the Other variable varied greatly. A sample of responses ranged from IT Industry and Strategy to presentation skills and networking. A frequency analysis was also performed to realize the perception of workforce readiness with the sixteen variables (Table 6).

Table 6

Frequency Analysis of ISYS Program Alumni Workforce Readiness Skills Responses

Variables	N	Frequency	Percentage
English Language (spoken)	20	15	75%
Writing in English (grammar, spelling, etc.)	20	13	65%
Problem Solving	20	15	75%
Critical Thinking	20	15	75%
Collaboration/Working with Others	20	18	90%
Computer/Technical	20	11	55%
Project Management	20	12	60%
Knowledge within Major	20	12	60%
General Business Knowledge	20	15	75%
Willingness to Learn	20	19	95%
Ability to Learn	20	18	90%
Responsibility/Dependability	20	16	80%
Initiative	20	15	75%
Attitude Towards Work	20	15	68%
Attendance/Punctuality	20	16	80%
Other	20	6	30%

Note. Frequency is based on those responses that were Somewhat Well Prepared (4) to Well Prepared (5). Measures with $\geq 90\%$ frequency are in boldface.

Several variables, Collaboration/Working with Others, Willingness to Learn, and Ability to Learn, were in the top 90% of frequency for a Somewhat Well Prepared or Well Prepared survey reporting. Aside from the Other measure, Computer/Technical skills scored the lowest in the Somewhat Well Prepared and Well Prepared categories. This report closely correlated to the

ISYS program upperclassmen acknowledging they expected to obtain technical skills from the ISYS program. An interesting observance was that the most prepared skill, Collaboration/Working with Others was one of the skills researchers say are the most important (Benamati et al., 2010; Couger et al, 1995; Paranto, 2002).

The next question on the ISYS program alumni online survey asked participants to rank the top five skills essential to being successful in the workplace. Problem solving, Collaboration/Working with Others, Computer/Technical, Critical Thinking, and Willingness to Learn had the most selections. These skills also reflected important skills in the literature (Benamati et al., 2010; Casner-Lotto et al., 2006; Couger et al, 1995; Paranto, 2002; Todd et al., 1995). There was not a clear number one ranking. Those skills recognized as the number one essential skill most often were Writing in English, Computer/Technical, Ability to Learn, and Responsibility/Dependability. Each of these skills was recognized twice as the number one essential skill. Response frequency was processed for the overall workforce preparation rating and the descriptive statistics were provided (Table 7).

Table 7

Frequency Analysis and Descriptive Statistics of ISYS Program Alumni's Perception of Their Overall Workforce Preparedness by the ISYS Program

Variable	Frequency Analysis		Descriptive Statistics	
	Responses	Percentage	Statistic	Value
Not Prepared	0	0%	Min Value	2
Somewhat Not Prepared	2	10%	Max Value	5
Adequately Prepared	5	25%	Mean	3.90
Somewhat Well Prepared	6	30%	Median	4
Well Prepared	7	35%	Variance	1.04
Total	20	100%	Standard Deviation	1.02

Overall the ISYS program alumni felt the ISYS program adequately prepared them for the workforce. No alumni reported the ISYS program did not prepare them for the workforce.

Research Question Three Results and Discussion

Research question three was considered: Were there differences between perceptions of workforce readiness by the upperclassmen undergraduate students and the alumni of the Information Systems bachelor's degree program? For this research question common and divergent themes were observed. With the exception of Other workforce readiness skill, the Computer/Technical skill had the lowest frequency for Somewhat Well Prepared and Well Prepared for both ISYS program alumni and upperclassmen. The Ability to Learn measure was a common highest frequency skill for both participant groups.

The descriptive statistics between the ISYS program upperclassmen and the alumni was conducted for the fifteen of the sixteen variables and the three constructs. The Other variable was removed because of the diversity of responses between the two groups. According to the

skill means, Collaboration/Working with Others, Willingness to Learn, Ability to Learn, Attendance/Punctuality, and Responsibility/Dependability were the highest means between ISYS program upperclassmen and alumni. Four of the five skills were classified as part of the Personal Traits construct. This complimented the highest mean among the three constructs, Personal Traits which was 4.35. The Communication construct was second with a mean of 4.23 and the IS Core Competencies construct was third with a mean of 3.75.

A t-test was run for the fifteen variables and three constructs. The fifteen variables were not statistically significant except for the Attendance/Punctuality variable. The three constructs were not statistically significant. An ANOVA was conducted to verify the t-tests. The results concurred with the t-tests.

The overall rating of the ISYS program workforce preparedness was reported as at least adequately prepared. The median for both groups was 4 which represents a Somewhat Well Prepared rating. A t-test was conducted for the overall rating. ISYS program upperclassmen and alumni were not significantly different. Alumni felt more prepared for the workforce than the upperclassmen but there was a higher standard deviation from the mean in alumni than upperclassmen. This could have been because there were a small number of completed responses for alumni compared to upperclassmen. There was a possibility that the fear of the unknown may be playing a role in the difference of preparedness perception. Teamwork and Learning were the most common skills prepared as perceived by ISYS program alumni and upperclassmen.

Research Question Four Results and Discussion

Research question four addressed: How did employers who have hired the University of Arkansas Information Systems alumni describe these former students' workforce readiness upon

entry into their positions? Question one of the interview asked what were the expectations of the ISYS program graduates to set a benchmark for the expectations. A popular theme was programming skills, working in a team environment, analysis, ERP experience especially SAP, and basic knowledge of methodology and organizational disciplines. These skills are in line with the sixteen measures used in the Employer instrument and in the Casner-Lotto et al. (2006) report as well as the literature (Benamati et al., 2010; Casner-Lotto et al., 2006; Couger et al., 1995; Paranto, 2002; Todd et al., 1995). Employers of ISYS program graduates also provided workforce readiness skills they felt were adequately prepared by the graduates in question two. Those skills were:

- Flexibility
- Adaptable to change
- Assimilating data
- Problem-solving
- Initiative
- Self-development
- Innovation
- SAP ERP basics
- Teamwork
- Foundational proficiency with current technologies
- Willingness to learn
- Overall understanding of large company system processes and procedures
- Understanding of how applications, database, and coding work together
- Software development

- Resourcefulness or research skills
- Project management
- Well-rounded knowledge of business
- Communication in environment

Many of the skills employers reported are a part of the sixteen variables used in the instrument. This question was asked before the list of sixteen variables was presented. Many of skills provided fit within the three constructs formed.

Based on the third interview question, there were workforce readiness skills that employers felt ISYS program graduates were not adequately prepared including: team dynamics, cross-team collaboration, understanding corporate cultures, programming, analytics, written and verbal communication, problem solving, practical experience, technical skills, and ERP software as opposed to ERP's place in the business. Programming and communication skills appeared the most often by employers. Six out of eight employers felt the programming skills were not adequate and three out of eight employers believed communication was not adequate. Many of the skills felt inadequate are communication based skills.

Descriptive statistics (Table 8) and a frequency analysis (Table 9) of the sixteen workforce skills incorporated in the instrument were performed. The scale for the sixteen variables was changed for employers to correspond to the Casner-Lotto et al. (2006) instrument. The scale for the variables was 1 = High Need and 2 = Low Need with regards to training.

Table 8

Descriptive Statistics of Workforce Variables Reported by Employers of ISYS Program Graduates

Variable	N	Minimum	Maximum	Mean	Std. Deviation
English Language (spoken)	8	1	2	1.38	.518
Writing in English (grammar, spelling, etc.)	8	1	2	1.38	.518
Problem Solving	8	1	2	1.13	.354
Critical Thinking	8	1	2	1.25	.463
Collaboration/Working with Others	8	1	2	1.25	.463
Computer/Technical	8	1	2	1.50	.535
Project Management	8	1	2	1.63	.518
Knowledge within Major	8	1	2	1.25	.463
General Business Knowledge	8	1	2	1.75	.463
Willingness to Learn	8	1	2	1.38	.518
Ability to Learn	8	1	2	1.38	.518
Responsibility/Dependability	8	1	2	1.38	.518
Initiative	8	1	2	1.38	.518
Attitude Towards Work	8	1	2	1.38	.518
Attendance/Punctuality	8	1	2	1.38	.518

Note. The Other skill was not used by Employers of ISYS program graduates and therefore no assessment was made.

Table 8 displayed Problem Solving, Critical Thinking, Collaboration/Working with Others, and Knowledge within Major were the top skills that highly need training. General Business Knowledge, Project Management, and Computer/Technical were skills requiring the least

amount of training. With programming skills as the number one inadequate skill for employers, the descriptive statistics did not reflect this in the Computer/Technical skills variable. A frequency analysis was conducted on the data (Table 9) to gain a better understanding of the high training needs.

Table 9

Frequency Analysis of Employers of ISYS Program Graduates High Training Needs of Workforce Readiness Skills Responses

Variable	N	Frequency	Percentage
English Language (spoken)	8	5	62.5%
Writing in English (grammar, spelling, etc.)	8	5	62.5%
Problem Solving	8	7	87.5%
Critical Thinking	8	6	75%
Collaboration/Working with Others	8	6	75%
Computer/Technical	8	4	50%
Project Management	8	3	37.5%
Knowledge within Major	8	6	75%
General Business Knowledge	8	2	25%
Willingness to Learn	8	5	62.5%
Ability to Learn	8	5	62.5%
Responsibility/Dependability	8	5	62.5%
Initiative	8	5	62.5%
Attitude Towards Work	8	5	62.5%
Attendance/Punctuality	8	5	62.5%

Note. Frequency was based on those responses that were High Need (1). The top four skills having high training needs are in boldface.

Problem solving, Critical Thinking, Collaboration/Working with Others, and Knowledge within Major were the highest training needs. This was reflective of the descriptive statistics report in Table 8 and the important skills needed based on the literature (Benamati et al., 2010; Casner-Lotto et al., 2006; Couger et al, 1995; Paranto, 2002; Todd et al., 1995). Problem solving and critical thinking were also in the top 5 high-need training gap skills reported in *Ill-Prepared U.S. Workforce: Exploring the Challenges of Employer-Provided Workforce Readiness Training* by Casner-Lotto et al. (2009).

Question five asked employers for examples of success with workforce readiness.

Responses from the employers included:

Employer 1: (1) New hires are willing to take risks. They are comfortable reaching out to stakeholder groups and communicating. (2) Taking the initiative and not waiting to be told what to do each step in the process.

Employer 3: [Graduate Name] joined the IS Trade Management team one year ago, and is quite fluent in specific areas of SAP. She works very well with team mates and business users and is a good problem solver. Adapted well to the fast pace of the project. [Graduate Name] joined [Company's] IS Networking team two years ago after an internship with [Company] IS. He is a skilled problem solver, independent thinker, and quick learner. He did well with programming and system aspects of the work. Adapted well to the diverse technical challenge and complexity of the environment.

Employer 5: Good attitude, willingness to learn and take direction, initiative.

Employer 7: Technical programming skills, project management, big picture, willing to learn, adapt to change.

Employer 8: We find that ISYS majors are natural leaders. They ask when they don't know and they learn and train to become better.

From these insights ISYS program graduates' willingness to take risks, learn, ask for help, and take initiative were prominent themes.

The interview also asked employers to identify the biggest workforce readiness skill gaps and the challenges addressing them. Six out of eight employers reported. Table 10 illustrates the skill gaps reported by ISYS program employers and the challenges to address them.

Table 10

Employers of ISYS Graduates Skill Gap Identification and Challenges to Address Skill Gaps

Skill Gap	Challenges to Address
Adaptation to corporate culture and how teams work together.	First, teaching them to recognize it and then how to build strong relationships to effectively work in the environment
Diverse internship based experience.	Place students in internships in earlier college years with different firms.
Attitude toward work, problem solving skills.	Graduates need to understand they are coming in to prove themselves and bosses will care if they show up or not and can tell if they are interested. They need to show ambition and excitement to learn new things; take the initiative to ask for more and challenging work.
Social skills, communication.	Time to get into professional comfort level.
Programming.	Training - timing thinking they have the skill set but don't actually.
Just being on the same technical skills as our Computer Science graduates as far as programming skills they are familiar with.	I would suggest offering (sic) and promoting a cross over into the Computer Science for elective classes however (sic) I hear from a lot of students that they don't have enough hours because their major requires so many classes to graduate.

Communication skills, problem solving, and technical skills were the main themes for the skill gaps and the obstacles to address the skill gaps. Related to the quantitative data and literature, the skill gaps reported were in line with the need for Collaboration/Working with Others and

Problem Solving (Benamati et al., 2010; Casner-Lotto et al., 2009; Casner-Lotto et al., 2006; Couger et al, 1995; Paranto, 2002; Todd et al., 1995). However, Technical Skills were identified as needing improvement yet in the qualitative data, the employers conveyed there was a low need for training.

An overall rating of the ISYS Program graduates’ workforce preparedness by the ISYS Program was the last question of the interview instrument. Frequency analysis and descriptive statistics were completed for the overall preparedness rating of the ISYS program new hires (Table 11).

Table 11

Frequency Analysis and Descriptive Statistics of Employers’ Perception of the ISYS Program Graduates’ Overall Workforce Preparedness by the ISYS Program

Variable	Frequency Analysis		Descriptive Statistics	
	Responses	Percentage	Statistic	Value
Not Prepared	0	0%	Min Value	2
Somewhat Not Prepared	2	25%	Max Value	4
Adequately Prepared	4	50%	Mean	3.00
Somewhat Well Prepared	2	25%	Median	3.00
Well Prepared	0	0%	Variance	.571
Total	8	100%	Standard Deviation	.756

From the frequency analysis and descriptive statistics report (Table 11), the majority of employers, 75%, felt the ISYS program graduates were Adequately to Somewhat Well Prepared.

Research Question Five Results and Discussion

Research question five addressed: Were there differences between perceptions of workforce readiness by Information Systems alumni employers, Information Systems upperclassman students, and alumni of the Information Systems bachelor's degree program? Table 12 describes commonalities and differences observed in all similar and related questions across all three instruments.

Table 12

Commonalities and Differences Observed Related to ISYS Program Alumni's and Upperclassmen's and Employers' of ISYS Program Graduates Perceptions of Workforce Readiness

Parameter	Study Participants		
	Upperclassmen	Alumni	Employers
What skills are expected to be obtained prior to instrument skills list exposure?	Programming, Enterprise Resource Planning (ERP), Project management, Database administration and design, IT general knowledge, Analysis, Systems Analysis and Design, Problem Solving, Communication, Teamwork, and Technical skills	Programming, Project management, General business knowledge, Technical skills, Database design, Analytical skills, Collaboration, Working knowledge of enterprise systems, and IT knowledge	Willingness to learn, Adaptability to change, Teamwork, Basic understanding of systems and technology, Database design, Programming, Analysis, ERP configuration, Analytics, Great attitude, Software development, Problem Solving, Project management, and Communication
Instrument provided skills that are adequately prepared	All sixteen skills are felt on average to be adequately prepared.	Collaboration/Working with Others, Willingness to Learn, and Ability to Learn	General Business Knowledge, Project Management, and Computer/Technical
Instrument provided skills that were the least prepared	Computer/Technical, Project Management, Knowledge within Major, and Critical Thinking	Computer/Technical, Project Management, Knowledge within Major, and Writing in English	Problem Solving, Critical Thinking, Collaboration, and Knowledge within Major
Overall perception of workforce readiness by ISYS Program	Overall Mean: 3.59 (Adequate) 60/69 Adequately Prepared and Above or 87%	Overall Mean: 3.90 (Adequate) 18/20 Adequately Prepared and Above or 85%	Overall Mean: 3.00 (Adequate) 6/8 Adequately Prepared and Above or 75%

There was an additional assumption to be made when analyzing the fifth research question. It was assumed that employers felt a skill was inadequate for workforce readiness if there was a high need for training and conversely if the skill was in low need for training, the skill was adequate regarding workforce readiness. The expectations in regards to workforce reading skills among all three perceptions had similar and contrasting trends. Programming, project management, analytics, teamwork, and IT general knowledge appeared in all three perceptions. Alumni and upperclassman were more similar in nature because both participant groups had traditional IS skills needed for the workforce. By contrast, employers had in addition to the traditional IS skills more experienced and mature skills present. ISYS program alumni and upperclassman had similar beliefs on the adequately prepared skills including Collaboration/Work with Others, Willingness to Learn, and Responsibility/Dependability. Employers had a completely opposite perception with General Business Knowledge, Project Management, and Computer/Technical workforce readiness skills having adequate preparation.

A common inadequate workforce readiness skill across all participant groups was Knowledge within Major. Computer/Technical skills were insufficient for both ISYS program alumni and upperclassmen and yet acceptable for employers. On the contrary, Collaboration/Working with Others was a subpar skill for employers, yet a highly regarded prepared skill for ISYS program alumni and upperclassmen.

The overall perception of workforce preparedness was similar for both the upperclassmen and the alumni of the ISYS program. Eighty-seven percent of upperclassmen believed they were adequately prepared for the workforce by the ISYS program. Eighty-five percent of alumni felt they were adequately prepared for the workforce by the ISYS program. Employers thought ISYS program graduates were adequate in their workforce preparedness according to the overall

mean and median. Seventy-five percent of employers thought that the ISYS program graduates were adequately prepared. A t-test was conducted to test if there was a statistical significant difference of the overall rating means between the ISYS program upperclassmen and the employers. The t equaled 1.769 and the p was greater than .05 which is interpreted as the difference of the upperclassmen and employer means are not statistically significant.

Conversely, there is a statistically significant difference of the overall rating means between the ISYS program alumni and employers ($t = 2.249$, $p = .033$).

Chapter Summary

This chapter presented the results and discussion for each of the five research questions. The perceptions of the three participant groups were explored and analyzed. Research question one found the ISYS program upperclassmen felt adequately prepared for the workforce and that they would like to have more computer and technical skills incorporated into the program to reinforce workforce readiness. The upperclassmen are concerned that they do not have the proper skill set for the workforce. Research question two also found the ISYS program alumni believed they were adequately prepared for the workforce. They too would like to have had more computer and technical skills built into the program. The findings of research question three showed the ISYS program upperclassmen and alumni to be similar in thought in what skills needed to be improved and what skills were satisfactorily covered through their program. Employers on the other hand for research question four, focused on the opposite adequate skills of the ISYS program upperclassmen and alumni. This observance precisely followed the existing literature. Skills that were thought to be effective by ISYS program upperclassmen and alumni were completely contradictory to the employer thinking. Research question five

observed commonalities and differences between all three participant groups. While there were some similarities, there were also significant variations in the findings.

Chapter V

Conclusion

Summary of the Study

This study explored the perceptions of workforce preparedness of students from the perspectives of current ISYS upperclassmen, recent ISYS program alumni, and ISYS graduates' employers. The workforce readiness skills required to be successful at the ISYS graduate's job were surveyed, interviewed, and collected. The research questions that directed this study were adapted from the Casner-Lotto et al. (2006) and (2009) reports.

The findings of this exploratory study mirrored the literature. Employers felt that graduates were not quite ready for full-time employment after graduation in some workforce readiness skills. Within this study, the workforce skills thought to be adequate to well-prepared by ISYS program upperclassmen and alumni were contrary to employers' perceptions. Students and alumni felt they had inadequate computing and technical skills and yet employers thought those skills were adequate. Conversely, students and alumni believed they had Collaboration/Working with Others skills and employers felt differently towards that skill.

Conclusions

Based on the findings of this research and previous studies, there are observations to consider:

- Students, alumni, faculty, administrators, and employers must work together if there is to be a collective effort towards improving the workforce readiness of higher education graduates.
- Approaches to skills in academia may be different than those in industry. An example of this is the ISYS students will have a group project in almost all upper level classes. This

might be the reasoning behind the confidence by students and alumni to have at least adequate Collaboration/Working with Others skills. Whereas employers have a differing definition of collaboration which includes cross-collaboration among teams which the students and alumni may or may not have had experience in this concept and therefore it is perceived by employers as an inadequate skill.

- The literature reported similar workforce readiness criteria to compare for this study; however, often the criteria was different.
- Workforce readiness and recruitment and retention of ISYS students are not mutually exclusive. To help boost enrollment numbers, efforts towards adequately preparing students for the workforce must have earnest and thoughtful consideration and then action.

Limitations

There was an inherent bias in the qualitative portion of the study due to the researcher's faculty position in the department of the researched subjects. An additional limitation of this study was the small sample size of the number of alumni from 2009 to 2012. The number of ISYS major students across the United States has been small because of the battered job market as a result of the early 21st Century economic recession and outsourcing (Walstrom, Schambach, Jones, & Crampton, 2008). Another limitation to this study was the concentration of data from only one institution which confines the generalizability of the outcomes. Moreover, the sample was one of convenience conversely to random. The inability to interview ISYS program alumni to follow-up on their observed experiences with the transition from an upperclassman in the ISYS Program to the first year on the job was equally a restriction to this study. The lack of a

faculty perspective on ISYS program students' workforce preparedness was a constraint to the conclusions of this study.

Contributions

Management Information Systems as a major is number six in the top degrees in demand at the bachelor's degree level as reported by NACE in the *Job Outlook 2013* (2013). As number six, 49.5% of the employer respondents to the survey stated they would hire management information systems majors in 2013. With such demand for the major, it is critical for ISYS graduates to be ready to enter the workforce and meet or exceed employers' expectations.

The information gained from this study will help guide the undergraduate coordination and curriculum for the University of Arkansas ISYS program. The identified skills required for success in relation to workforce preparedness can be reinforced in the ISYS major curriculum. The spotlight is focused on workforce preparations of the ISYS program students.

Institutions will be able to take this research and incorporate the needed workforce readiness skills the employers have reported into their course design and content. New ways to infuse these skills into college programs will help prepare the students for future employment and may assist with employers establishing a relationship with the institution for employment. New methodologies of enhancing these skills will assist the future workforce generation.

Future Research

Further exploration in the following areas would contribute to the advancement of this study:

- Include faculty's perspective of ISYS Program students' workforce preparedness;
- Create a comparison study of the current findings with findings after potential curriculum adjustments are made to observe perception changes;

- Explore graduate programs' workforce preparedness;
- Expand the study to include other universities;
- Explore potential gender differences in workforce preparedness;
- Add a study to observe whether service learning and or leadership program participation contributes to workforce preparedness.

Chapter Summary

This chapter provided a summary and conclusions of the study. Limitations of the study were also presented in this chapter. The contributions of the study are a motivator to understand and take action towards preparing the ISYS program students for the workforce. Future research for this topic of study has vast directions that can be pursued.

Personal Reflection

This research study has a particular interest to me. As an educator in higher education, my goal and desire for my students is for them to be successful in their future workforce endeavors. I strive to encourage students to develop skills in the areas of critical thinking, problem solving, project management, communication, team collaboration, general business knowledge, and information systems knowledge. I believe that teaching is about giving the students the tools and foundational knowledge they need to be successful in their future career or academic pursuits.

Part of my new responsibilities as an educator is to assist with recruitment and retention of our Information Systems majors. This study has revealed to me the current environment of workforce readiness for our majors and the direction that it needs to steer. I am excited to be an integral part to this practical research area and the efforts to empower our students to be workforce ready.

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Appendices

Appendix A
IRB Approval

February 18, 2013

MEMORANDUM

TO: Susan Bristow
Kit Kacirek

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-02-465

Protocol Title: *Workforce Preparedness of Information Systems Students: Perceptions of Students, Alumni, and Employers*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 02/18/2013 Expiration Date: 02/17/2014

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 650 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

Appendix B

ISYS Program Upperclassman Survey Instrument

Part I: Background Information

Instructions: Please answer each question to the best of your ability. All responses will be held in strictest confidence and only group data will be reported.

1. What is your classification:

_____ Junior _____ Senior

2. Which semester are you currently in for your classification:

_____ 1st _____ 2nd Other _____

3. Which ISYS Program degree concentration are you pursuing?

_____ Enterprise Resource Planning (ERP) _____ Enterprise Systems _____ IT Applications

Part II: Workforce Development Skills

Instructions: Please answer the following questions. Again, all responses will be held in strictest confidence and only group data will be reported.

1. What skills do you expect to obtain at the completion of the ISYS Program?

2. As an ISYS Program major, your perception of workforce preparedness is important. To what extent do you feel that you have been adequately prepared in the following areas based on your ISYS Program experience? *Please indicate the degree to which each statement applies to you by marking whether you feel: Not Prepared = 1; Somewhat Not Prepared = 2; Adequately Prepared = 3; Somewhat Well Prepared = 4; Well Prepared = 5.*

- _____ a) English language (spoken)
 - _____ b) Writing in English (grammar, spelling, etc.)
 - _____ c) Problem Solving
 - _____ d) Critical Thinking
 - _____ e) Collaboration/Working with Others
 - _____ f) Computer/Technical
 - _____ g) Project Management
 - _____ h) Knowledge within Major
 - _____ i) General Business Knowledge
 - _____ j) Willingness to Learn
 - _____ k) Ability to Learn
 - _____ l) Responsibility/Dependability
 - _____ m) Initiative
 - _____ n) Attitude Toward Work
 - _____ o) Attendance/Punctuality
 - _____ p) Other
-

3. What concerns do you have about being workforce ready?

4. In general, how would you rate your preparedness for the workforce by the ISYS Program?

- _____ Not Prepared
- _____ Somewhat Not Prepared
- _____ Adequately Prepared
- _____ Somewhat Well Prepared
- _____ Well Prepared

Thank you for taking the time to complete this survey and for your participation in this study.

Survey questions to be answered based on interview and survey questions used in the “Are They Really Ready to Work?” and “The ILL-Prepared U.S. Workforce” reports created by ASTD, The Conference Board, SHRM, Partnership for 21st Century Skills, and Corporate Voices for Working Families (p. 61 – “Are They Really Ready To Work” Report, p. 1, 3, and 7 - Survey).

Appendix C

ISYS Program Alumni Survey Instrument

Part I: Background Information

Instructions: Please answer the question to the best of your ability.

1. Which ISYS Program degree concentration did you pursue?

_____ Enterprise Resource Planning (ERP) _____ Enterprise Systems _____ IT Applications

Part II: Workforce Development Skills

Instructions: Please answer the following questions. All responses will be held in strictest confidence and only group data will be reported.

1. What skills did you expect to obtain at the completion of the ISYS Program?

2. As an ISYS Program alum/alumna, your perception of your workforce preparedness is important. To what extent do you feel the ISYS Program prepared in the following areas? *Please indicate the degree to which each statement applies to you by marking whether you felt: Not Prepared = 1; Somewhat Not Prepared = 2; Adequately Prepared = 3; Somewhat Well Prepared = 4; Well Prepared = 5.*

- _____ a) English language (spoken)
- _____ b) Writing in English (grammar, spelling, etc.)
- _____ c) Problem Solving
- _____ d) Critical Thinking
- _____ e) Collaboration/Working with Others
- _____ f) Computer/Technical
- _____ g) Project Management
- _____ h) Knowledge within Major
- _____ i) General Business Knowledge
- _____ j) Willingness to Learn
- _____ k) Ability to Learn
- _____ l) Responsibility/Dependability
- _____ m) Initiative
- _____ n) Attitude Toward Work
- _____ o) Attendance/Punctuality
- _____ p) Other

3. In your professional opinion, please rank the top 5 skills from the list below that are essential for success in the workplace by placing a 1 (highest, most essential), 2, 3, 4, and 5 by the skill that you believe to be the most essential.

- _____ a) English language (spoken)
- _____ b) Writing in English (grammar, spelling, etc.)
- _____ c) Problem Solving

- _____ d) Critical Thinking
 - _____ e) Collaboration/Working with Others
 - _____ f) Computer/Technical
 - _____ g) Project Management
 - _____ h) Knowledge within Major
 - _____ i) General Business Knowledge
 - _____ j) Willingness to Learn
 - _____ l) Ability to Learn
 - _____ m) Responsibility/Dependability
 - _____ n) Initiative
 - _____ o) Attitude Toward Work
 - _____ p) Attendance/Punctuality
 - _____ q) Other
-

4. In general, how would you rate your preparedness for the workforce by the ISYS Program?

- _____ Not Prepared
- _____ Somewhat Not Prepared
- _____ Adequately Prepared
- _____ Somewhat Well Prepared
- _____ Well Prepared

Thank you for taking the time to complete this survey and for your participation in this study.

Survey questions to be answered based on interview and survey questions used in the “Are They Really Ready to Work?” and “The ILL-Prepared U.S. Workforce” reports created by ASTD, The Conference Board, SHRM, Partnership for 21st Century Skills, and Corporate Voices for Working Families (p. 61 – “Are They Really Ready To Work” Report, p. 1, 3, and 7 - Survey).

Appendix D

Employers of Information Systems Graduates Interview Instrument

Introduction protocol: Thank you for your willingness to participate in this interview. I am a researcher from the University of Arkansas who is conducting research to determine if Information Systems (ISYS) students demonstrate expected workforce- ready competencies. For about 30 to 45 minutes I will ask you to share your knowledge. Your participation is voluntary. Thank you in advance for your assistance. Your participation is voluntary. Thank you in advance for your assistance.

Interview Questions

1. What are your expectations for ISYS Program graduates?
2. What skills are newly hired ISYS Program graduates adequately prepared?
3. What skills are newly hired ISYS Program graduates not adequately prepared?
4. Do you feel there is a high need or a low need for training in the following areas or skills by the ISYS Program graduates? *High Need = 1; Low Need = 2*

- _____ a) English language (spoken)
- _____ b) Writing in English (grammar, spelling, etc.)
- _____ c) Problem Solving
- _____ d) Critical Thinking
- _____ e) Collaboration/Working with Others
- _____ f) Computer/Technical
- _____ g) Project Management
- _____ h) Knowledge within Major
- _____ i) General Business Knowledge
- _____ j) Willingness to Learn
- _____ k) Ability to Learn
- _____ l) Responsibility/Dependability
- _____ m) Initiative
- _____ n) Attitude Toward Work
- _____ o) Attendance/Punctuality
- _____ p) Other

-
5. When it comes to workforce readiness of new hires, what are some examples of success?
 6. What is your biggest workforce readiness skill gap you see?
 7. What is the biggest challenge to addressing it?
 8. In general, how would you rate the preparedness of new hires from the ISYS Program?
 - _____ Not Prepared
 - _____ Somewhat Not Prepared
 - _____ Adequately Prepared
 - _____ Somewhat Well Prepared
 - _____ Well Prepared

Thank you for taking the time to complete this interview and your participation in this study.

Interview questions to be answered based on interview and survey questions used in the “Are They Really Ready to Work?” and “The ILL-Prepared U.S. Workforce” reports created by ASTD, The Conference Board, SHRM, Partnership for 21st Century Skills, and Corporate Voices for Working Families (p. 61 – “Are They Really Ready To Work” Report, p. 1, 3, and 7 - Survey).