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Use of the Silver-Level Arkansas Career Readiness Certificate as a Pre-hire Screening Tool

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Use of the Silver-Level Arkansas Career Readiness
Certificate as a Pre-hire Screening Tool

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

by

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ABSTRACT

At a statewide level in Arkansas, the Arkansas Career Readiness Certificate (ACRC) is marketed as a means for assessing and exhibiting individual worker skill levels and as an additional aggregate credential to be presented alongside high school and college degree attainment levels. Employers from multiple sectors use the ACRC as a pre-hire screening tool and to determine incumbent worker eligibility for advancement.

Despite having been in place in the state for nearly a decade with over 65,000 Arkansans earning an ACRC, prior to this study no research had been conducted to determine the effectiveness of the ACRC as a pre-hire screening tool. The research question of this study focused on the silver-level ACRC and the perception of human resource managers at manufacturing firms in Arkansas regarding the certificate's influence on hiring higher-performing employees. The study sought out the managers' perceptions related to employee safety, productivity, and retention.

Data collection for this mixed methods study was conducted in two phases. The first phase included an online quantitative survey of 23 human resource managers at manufacturing firms in Arkansas. The second phase included in-person interviews of a subset of the original survey participants. Nine interviews were conducted to further explore the issues of employee safety, productivity, and retention as related to the ACRC.

Findings from the study concluded that use of the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool does lead to hiring higher performing employees. This study further concluded that employee productivity is positively impacted more than safety or retention, and that overall performance of employees with the certificate was improved as compared to those without it.

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DEDICATION

This dissertation and all the work that went into the completion of this degree are dedicated to my family. Without their love and support, none of this would have been possible.

This is dedicated to my brother for showing the path to and through higher education. He showed me how education leads to opportunity.

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CHAPTER 1: INTRODUCTION

As organizational structures have adjusted to global economic and competitive realities in the late twentieth and early twenty-first centuries, the critical need for strategic hiring and placement has become increasingly important for all types of firms. Newly hired employees must be able to acquire skills quickly and exhibit critical thinking ability as means to be productive at a high level (Stanley, 2004).

Employers have the ongoing challenge of not knowing if their pre-hire efforts to identify and retain safe and productive employees are effective (Hendrick & Raspiller, 2011). In Arkansas, the Career Readiness Certificate has been promoted to assist employers in that identification process. Is the Arkansas Career Readiness Certificate a tool that can effectively assist employers in identifying prospective employees who are a good match for open positions?

An Arkansas Career Readiness Certificate is a portable credential based upon the WorkKeys® assessments that demonstrates to employers that an individual possesses the basic workplace skills required for 21st century jobs. Getting a CRC will allow an individual to show prospective employers that he or she possesses the basic skills they are looking for. (Arkansas Department of Workforce Services, 2015b)

These claims by the Arkansas Department of Workforce Services suggest that by having a Career Readiness Certificate, prospective employees have proof of certain important workplace skills. But does hiring people with those basic skills actually translate into better rates of retention, safety, and productivity for the employer?

Background

To remain competitive in the global economy, firms must first make capital investments in physical plant and equipment enhancements, and then, to support those improvements, adequately skilled employees need to be recruited and retained in order to operate and maintain equipment while comprehending the concepts inherent to the newly adopted and associated

processes (Thornhill, 2006). In Arkansas, the Career Readiness Certificate has been identified and is promoted as one method for employers to identify potential employees with basic skills needed for success.

In today's competitive economic development arena, municipalities and regional consortia attempting to attract new employers to their respective areas must provide more than the traditional location, physical attributes, and fiscal incentives. Historically, adequate infrastructure (i.e., land, utilities, access to road, rail, navigable waterways, airports, pipelines, etc.) and tax and utility cost reduction incentives paired with appropriate quality-of-life amenities were the hallmarks of locales worthy of consideration by site selection agents and industrial prospects (Gambale, 2014).

The process of marketing to industrial prospects has shifted in recent years to one where a potential site's physical worthiness is no longer the key consideration. Access to an existing highly skilled or trainable workforce is now the primary issue on which site viability is ultimately determined, and appropriately skilled workers are necessary for firms to compete in the global economy (Buss, 2014). Evidence of collaboration among education providers and the business sector is required for potential job creators to gain confidence in the viability of a particular site or region (Brown & Parkins, 2013).

This recent shift in employer requirements for locale viability is the latest in the ongoing maturing process of the manufacturing sector in the United States since the early twentieth century. The predominant economic model of the early industrial age was one based on assembly line efficiencies and cost per unit as the leading profit indicator. Worker efficiency and productivity measures focused on piece-work rates and quotas. Overall worker skill was a secondary consideration as line work was based on repetitive motion and required little or no

creativity. In contrast to the industrial age, Drucker (1959) presented his theories and predictions pertaining to knowledge workers and how those employees with adequate experience, expertise, and knowledge will be the determining factor in a firm's ability to remain competitive.

Drucker's (1959) predictions have proven reliable today in that having employees properly matched with specific skills and expertise is indeed essential for productivity and profitability (Hankin, 2005). Stanley (2004) confirmed that significant overall productivity gains can be realized by those organizations which systematically hire and place highly skilled workers and benefit from creating workgroups made up of such employees. Deitz and Orr (2006) noted that manufacturing-based high-skill jobs have increased by 37 percent since the early 1980s and that "technology and increased globalization have, on the one hand, reduced the number of low-skill jobs and, on the other, provided opportunities for high-skill manufacturing employment to expand. As a result, a manufacturing workforce is emerging that is at once leaner and more skilled" (p. 7).

Efforts by Arkansas manufacturers to profile certain jobs and align those jobs with particular levels of the Arkansas Career Readiness Certificate (ACRC) have been based on marketing and promotion from the Arkansas Department of Workforce Services with claims of reduced turnover, improved morale, and effective use of training dollars (Arkansas Department of Workforce Services, 2015b).

In Arkansas, "middle-skill jobs account for 59 percent of Arkansas's labor market, but only 48 percent of the state's workers are trained to the middle-skill level" (DeRenzis & Chang, 2014, p. 1). The foundation of the Career Readiness Certificate (as part of the WorkKeys assessment system) is built on identifying skills needed for particular jobs through individual job profiles. Job profiles, composed by certified profilers, allow employers to determine critical

minimum competencies for incumbent workers and new hires. The nationally standardized WorkKeys assessment measures workers' skills against the profiled jobs, thereby indicating to employers the level of potential in basic functional and productivity areas including math, reading for information, and locating information. ACT, Inc., known for its college entrance exam products, designed the WorkKeys assessment and the accompanying Career Ready 101 career readiness self-paced preparation tools and practice exams. Through the Career Ready 101 and WorkKeys process, prospective employees are able to hone critical thinking and systems skills in a quantifiable assessment model (Ausman, 2008). Individuals successfully completing the WorkKeys assessment are awarded a Career Readiness Certificate (CRC).

The Arkansas Career Readiness Certificate (ACRC) is a branded product within the WorkKeys assessment system. The ACRC is the same earned credential as defined by the national CRC and is part of a statewide initiative to identify appropriately qualified employees to fill open positions which require specific workplace skills. The ACRC is based on the WorkKeys assessments and demonstrates to employers that an individual meets minimum requirements in reading for information, mathematics, and locating information.

Along with the WorkKeys assessment, Stone (2007) identified a number of other currently used and widely recognized work competency assessment instruments as follows: the Adult Measure of Essential Skills (AMES), the Assessments in Career Education (ACE), the Career Portfolio Assessment (CPA), the Career-Technical Assessment Program (C-TAP), the Comprehensive Adult Student Assessment System – Employability Competency System (CASAS-ECS), the National Occupational Competency Testing Institute (NOCTI) Job Ready Tests, the Vocational-Technical Education Consortium of the States (V-TECS), and the Workplace Success Skills System. Many of these are also in use in Arkansas, but because from

2007 through 2015 then-Governor Mike Beebe and then-Director of the Arkansas Department of Workforce Services Artee Williams aggressively pushed for statewide deployment, marketing, and adoption, use of the Career Readiness Certificate has received the most emphasis from state agencies and employers in recent years.

At a statewide level in Arkansas, the Arkansas Career Readiness Certificate (ACRC) is used and marketed as a means for assessing and exhibiting individual worker skill levels and as an additional aggregate credential to be presented alongside high school and college degree attainment levels (Arkansas Department of Workforce Services, 2015b). The ACRC program is conducted through a consortium effort of the Arkansas Department of Workforce Services, Arkansas Workforce Centers, the Arkansas Department of Career Education, the Arkansas Economic Development Commission, the Arkansas Department of Higher Education, the Arkansas Department of Education, the Arkansas Community Colleges, and the 22 two-year colleges throughout the state.

Having the ACRC as evidence of basic skills along with knowledge of job opportunities requiring the ACRC may increase hiring rates for those credential earners (Buddin, LeFebvre, & Walker, 2013). In Arkansas, individuals who successfully complete the WorkKeys assessments are awarded a bronze, silver, or gold level ACRC depending on their assessment scores. As of October 31, 2015, credentials were awarded to 64,815 Arkansans, including 15,069 gold, 38,343 silver, and 11,289 bronze certificates. The nationally-recognized platinum certificate is an option in Arkansas, but because employers have not placed higher value on applicants holding a platinum-level certificate, it is not a current focus of the ACRC system. To date, only 114 credential-seekers have opted to be further assessed and successfully completed requirements to earn a platinum certificate (Arkansas Department of Workforce Services, 2015a).

Based on available data tying together Career Ready 101, WorkKeys, employment, and wage outcomes, Arkansas workers who obtain an ACRC consistently see increased payroll earnings during the 12 months immediately following the assessment process. The following averages include all wage earners whether they worked full time, part time, or were unemployed for part of the year. Average annual earnings for bronze ACRC obtainers were \$11,900 in the year prior to obtainment and \$13,200 in the year following obtainment, a 10.9 percent increase. For silver ACRC obtainers, average earnings were \$13,100 in the year prior to obtainment and \$14,700 in the year following, a 12.2 percent increase. Gold ACRC obtainers earned an average of \$15,000 prior to obtainment and \$16,800 following obtainment, a 12 percent increase (Buddin et al., 2013).

Employers participating in the program use the ACRC as a pre-employment screening tool to match properly skilled potential employees with open positions in an attempt to limit remedial training and lost efficiency. Many Arkansas employers choose to have their specific jobs officially profiled to determine which level certificate holder best fits the demands of a particular job. The ACRC provides baseline information to employers about prospective employees' basic skills. It does not, however, provide any form of predictive analysis as to the employees' likelihood to be punctual, reliable, productive, or safe (Arkansas Department of Workforce Services, 2015b). Anecdotal reports from employers indicate that the process of filling vacant positions is made easier when the Arkansas Career Readiness Certificate (ACRC) is used as a pre-hire requirement, yet prior to this study no comprehensive review has been undertaken to gauge human resource managers' perceptions related to the ACRC as a predictor for employee performance.

Problem Statement

The mismatch between individuals who are unemployed or underemployed and the available jobs of today (and into the foreseeable future) threatens the viability of many organizations, particularly in middle-skill-dependent sectors such as advanced manufacturing. For employers, finding effective job-specific skills assessment tools for use in the hiring process is critical for future success (American Society for Training & Development, 2012).

It is a problem for employers to spend company resources on a pre-hire evaluation system without knowing if that expenditure actually makes a difference for safety, productivity, and retention of those employees hired within that system.

Ongoing expenditures related to ACRC profiling and hiring without knowledge of the effectiveness of the entire process elicits questions about continuing to use the ACRC as a pre-hire screening tool. Time and money are expended on job profiling and, by adding the ACRC as a pre-hire requirement, the number of potential applicants is decreased.

Purpose Statement

The purpose of this mixed methods project, through a multi-phase survey and interview process with human resource managers at manufacturing firms in Arkansas, was to gather perceptions of the effectiveness of using the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool. Information gathered focused on employee performance as related to safety, productivity, and retention.

Research Question and Hypotheses

The overall question to be answered by this mixed methods study was this: Do human resource managers at manufacturing firms in Arkansas believe that using the silver-level

Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool leads to hiring higher-performing employees? The study was guided by three hypotheses as follows:

Hypothesis 1: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in safety performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 2: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in productivity performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 3: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in retention of employees who earn the certificate as opposed to those who do not.

The second, qualitative phase of the study was focused on the perceptions of human resource managers through sub-questions as follows:

1. How do human resource managers perceive the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool as related to employee safety?
2. How do human resource managers perceive the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool as related to employee productivity?

3. How do human resource managers perceive the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool as related to employee retention?

Study Design and Conceptual Perspective

Explanatory sequential design was chosen for the overall model for this mixed methods study with a two-phase (quantitative then qualitative) paradigm including a post-positivist theoretical perspective in Phase I and a responsive evaluation approach with constructivist theoretical perspective in Phase II. This model allowed for the use of quantitative results to inform interview design in the qualitative phase (Creswell & Plano Clark, 2011). The mixed methods research model was chosen to allow for multiple techniques in acquiring data, analyzing said data, and reporting results for a particular set of questions (Hesse-Biber, 2010). The combination of statistical trends and personal narratives with one phase building upon the other gave equal importance to results from quantitative and qualitative evidence.

Phase I: Quantitative

A post-positivist theoretical perspective was used to guide the quantitative phase of the study. This approach allowed for positive knowledge to be identified and better understood through quantitative data collection (Savin-Baden & Major, 2013). Characteristics of the post-positivist view include empirical observation and measurement, verification of theory, reductionism, and determination (Creswell & Plano-Clark, 2011).

While the post-positivist perspective includes the consideration of knowledge as “personal, subjective, and unique” (Cohen, Manion, & Morrison, 2013, p. 6), the deterministic and reductionistic philosophies of post-positivism presume that cause is likely to determine effect and that broad concepts should be broken into distinct pieces for detailed examination

(Creswell, 2009). Practical implications for following a post-positivist theory include decisiveness (simple conclusions for hypotheses) and impartial collection of data through instruments that are formal, deductive, and unbiased (Creswell & Plano-Clark, 2011).

Phase II: Qualitative

A responsive evaluation methodology combined with a constructivist theoretical perspective was used to guide the qualitative phase of the study. This layered approach to the second phase of the study provided a more democratic and naturalistic path to the evaluation techniques (Lincoln, 2003).

Responsive evaluation, as a general method, orients the researcher to the personal experience of the participants through interactivity, understanding their surroundings and common experiences, and seeking out context (Stake, 2004). Emerging issues and preconceived issues can be positively exploited throughout responsive evaluation (even through very informal interactions) if proper levels of structure and planning are established prior to the evaluation (Madaus, Scriven, & Stufflebeam, 2012).

Rooted in pragmatism where the “focus is on the consequences of research, on the primary importance of the question asked rather than the methods, and on the use of multiple methods of data collection” (Creswell & Plano Clark, 2011, p. 41), responsive evaluation provides knowledge and insight relative to procedural effectiveness and the difference between anticipated outcomes vs. actual outcomes (Savin-Baden & Major, 2013). Use of this approach during the qualitative phase aligned with the overall research question of the study with particular relevance to perceptions of human resource managers of employees who have earned an Arkansas Career Readiness Certificate prior to being hired.

Through a constructivist theoretical perspective, information gathered was analyzed with the understanding that, by compiling multiple individual experiences, desired knowledge of a subject or phenomenon may be uncovered (Savin-Baden & Major, 2013). Constructivism can be characterized by the theories generated through exploration, various meanings and understandings brought forth by participants, and views built from historical and social influences (Creswell & Plano-Clark, 2011).

At its core, constructivism explores how individual perspectives are developed (Patton, 2014) and focuses on knowledge and how that knowledge was gained (Fosnot, 2013). The process of constructing knowledge without prior assumptions allows for a stronger foundation while, at the same time, permitting abstract thought to play an important role in the evaluation (Bergman, 2008). “What we call knowledge in no sense represents a world that presumably exists beyond our contact with it. Constructivism, like pragmatism, leads to a modified concept of cognition / knowledge” (Flick, Kardoff, & Steinke, 2004, p. 90).

Tashakkori and Teddlie (1998) described constructivism as an inductive paradigm approached from a subjective point of view where the “knower and the known are inseparable” (p. 23). In this paradigm, all entities are influenced by one another, and cause cannot be distinguished from effect.

Theoretical Framework

Ultimately, having knowledge of effectiveness leads to decisions needing to be made about whether to use the certificate as part of broader pre-hire systems. As such, the theoretical framework for this study was built on decision theory, and that theory was used to facilitate the blending and comparison of results from quantitative and qualitative data analyses.

Decision making is rarely a precise or clearly defined process. Multiple options, which can lead to a variety of outcomes, force the decision maker to act based on the current state with outcomes determined by how that action alters (or does not alter) the current state (Resnik, 2002).

While multiple decision theories are available to assist in understanding and predicting how people make decisions, for this study normative decision theory was the appropriate framework. Normative decision theories “seek to yield prescriptions about what decisions makers are rationally required – or ought – to do” (Peterson, 2009, p. 3).

Normative decision theory, also known as expected utility theory, provided a base set of decision-making assumptions and the opportunity to incorporate observation and evaluation into the theoretical interpretation of the decision-making process (Plous, 1993). While no decision protocol fully eliminates uncertainty, the consideration of utility allows a decision maker to employ greater rationality and to arrive at more rational conclusions (Parmigiani, 2009).

Normative decision theory focuses on “what criteria an agent’s preference attitudes should satisfy in any generic circumstances” (Steele & Stefansson, 2015, para. 2). As an orthodoxy, the theory suggests that when uncertainty occurs, the option which provides the best anticipated outcome will be preferred.

While other decision theories (such as descriptive decision theory) provide a basis for *how* decisions are made, normative decision theory provides a basis for how decisions *should* be made (Hansson, 1994). By examining and understanding how decisions should be made, normative decision theory provides a pathway to rational decisions.

Rationality plays a central role in developing confidence levels in decision making. Bermúdez (2009) identified three primary dimensions of rationality as they relate to decision

making or action guidance. First, rationality is used to limit decision options to a subset representing only those options which are legitimate. Second, rationality allows for consideration the question at hand and the broader reason that the question or problem exists. Finally, rationality may be used as a way to explain and/or predict decision making.

For many firms, an often unreliable heuristic approach is used to identify evidence (anecdotal or empirical) of return on investment for initiative deployment and/or continuation (Frankl, 2015). Through the lens of normative decision theory, this study provided connections between program effectiveness and the decisions employers should make about the use of the Arkansas Career Readiness Certificate.

Population Description / Methods

Through explanatory sequential research, results from this study have expanded existing knowledge related to the use of the Arkansas Career Readiness Certificate (ACRC). Data and results from the study provide insight as to human resource managers' ability to use the silver-level ACRC to successfully hire safe, productive, long-term employees. The mixed methods data collection incorporated a quantitative survey with one-on-one interviews with a subset of the initial sample.

Participants for this project were human resource managers at manufacturing firms in Arkansas which are currently or have recently been using the silver-level ACRC as a pre-employment screening tool. Participants for the quantitative phase were selected through convenience sampling based on ease of access. The current roster of employers using the ACRC provided a more-than-adequate source for identifying potential participants. For the qualitative phase, a subset of the first phase participants was selected through purposive sampling with

preferential selection consideration given to participants who indicated a willingness to participate in follow-up questioning during the quantitative phase.

The survey results were used to test hypotheses related to employee performance when the silver-level ACRC is incorporated in pre-hire protocols at manufacturing firms in Arkansas. Follow-up interviews allowed for a better understanding of the subject by exploring perceptions of human resource managers and further explication of the survey results. By gathering and comparing results of quantitative and qualitative data, a higher level of understanding of the issue was possible as opposed to using one or the other independently.

Manufacturing firms were identified as the target population for this study for four primary reasons as follows:

1. The ACRC has been adopted as a pre-hire screening tool by the manufacturing sector more than by any other employment sectors. This adoption rate allows for the best chance of a representative sample (Arkansas Department of Workforce Services, 2015e).
2. The skills gap in Arkansas is greatest in the manufacturing sector with middle-skill jobs accounting for the largest percentage mismatch in the state (DeRenzis & Chang, 2014).
3. Manufacturing firms are located in all areas of the state with adequate representation from numerous manufacturing sub-sectors.
4. Manufacturing firms vary in size (based on number of employees) throughout the state.

An explanatory sequential design mixed methods research model was used in two phases as follows:

Phase I: Quantitative data were acquired by electronic survey from human resource managers at manufacturing firms in Arkansas. The population size for Phase I included 58 prospective participants, 23 of whom completed the online survey.

Phase II: Qualitative data were acquired through interviews with a subset of the participants from Phase I. The population size for Phase II included 16 prospective participants, nine of whom were interviewed.

The mixed methods research model was chosen for this study to allow for multiple techniques in acquiring data, analyzing the data, and reporting results for a particular set of questions (Hesse-Biber, 2010). The combination of statistical results and personal narratives with one phase building upon the other, gave equal importance to results from quantitative and qualitative evidence.

Quantitative data were gathered from human resource managers using an online electronic survey to collect basic demographic information about the participants and their respective companies and perceptions of the silver-level certificate via Likert-type survey items.

Qualitative data were gathered by conducting interviews with a subset of the human resource managers who were surveyed during the quantitative-data-gathering phase of this study. The interviews helped determine to what extent the quantitative survey data accurately represent current sentiment among human resource managers at manufacturing firms in Arkansas, further explain the quantitative results, and increase the overall level of understanding of the effectiveness of using the silver-level ACRC as a pre-hire screening tool. Through the

combination of exploratory qualitative and quantitative questions, a more complete understanding of the issue was possible (Creswell & Plano Clark, 2011).

Data analysis for this study provided adequate results from each phase to allow for strand comparison and conclusions. To identify central tendencies, width of distributions, and shape of distributions in the quantitative data, descriptive statistics were used for each Likert-type item (Jackson, 2015). Each item was scored and analyzed independently with averages, percentages, and frequencies.

For the qualitative phase of the study, each interview was transcribed and independently reviewed multiple times for prominent themes, concepts, and evidence of judgments about the Arkansas Career Readiness Certificate program through evaluation coding (Saldaña, 2009). A summary narrative was created through the process of segmenting and labeling text within each transcript (coding), developing themes by combining common codes, and drawing connections across similar themes (Creswell, 2015).

Significance of the Study

Results of this study provide Arkansas employers and state agencies with additional knowledge for use in determining future design and deployment of initiatives associated with the Arkansas Career Readiness Certificate (ACRC) program. Locally and nationally, this study also expands the knowledge base related to the effectiveness of using the silver-level ACRC as a pre-hire screening tool.

Specific benefits of this study are as follows:

1. Manufacturing firms have additional information to assist in making decisions regarding use of the ACRC. As the manufacturing sector continues to move toward a skilled-workforce model, investments in recruiting, hiring, and training become even more

critical to profitability. By knowing the effectiveness of the ACRC system, employers are better equipped to make those investment decisions.

2. The Arkansas Department of Workforce Services has additional information on which future management of the ACRC system can be based. As the agency responsible for promoting and facilitating the system, having additional knowledge should allow for better informed decision making related to how manufacturers can best use the ACRC.
3. The Arkansas Economic Development Commission and other economic development entities throughout Arkansas are able to consider the results of this study in their efforts related to attracting new and retaining existing manufacturing firms. By having knowledge about the effectiveness of using the silver-level ACRC as a pre-hire screening tool, the economic development community may be able to more confidently promote the state and region as it relates to having a work-ready citizenry.

Innovative Aspects

Prior to this study, academic research related to human resource managers' perception of the effectiveness of the Arkansas Career Readiness Certificate (ACRC) in predicting employee performance had not been conducted. Through review and analysis of gathered data, stakeholders within the ACRC community have access to additional formal information on which planning and decision making can be based.

Previous studies related to the Career Readiness Certificate (CRC) have been focused on broader topics or related to the CRC in other states (Greene, 2008). This is the first study to focus on one CRC certificate level and the first dissertation regarding the ACRC.

Earlier studies have been primarily focused on quantitative data (Lindon, 2010). By using a mixed methods study, this project allowed a select group of human resource managers to have a

greater ability to express their beliefs about the effectiveness of the ACRC as a pre-hire screening tool.

Limitations

For this study, the limitations were identified as follows:

1. Method

- a. The sample size for this study was limited due to the small number of manufacturing firms in Arkansas which have profiled jobs and use the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool.
- b. The data collection methods (electronic survey for quantitative, interviews for qualitative) limited the study due to the diverse nature of participants in both research phases. While all participants represented manufacturing firms, there was very little consistency of manufacturing process or product within the sector. As such, the data collection methods were general in nature and not specific to any one participant's situation.
- c. The shortage of previous studies related to this topic affected this study by limiting points of comparison in existing literature.

2. Researcher

The author of this study has worked in and with many employers throughout Arkansas (including many of the human resource managers who were surveyed as part of this study), state agencies that manage the ACRC, and committees which work to promote the ACRC to employers. Personal opinions and biases of the author regarding how well any given employer screens, selects, and manages

employees had the potential to influence interpretation of data, particularly during analysis of the qualitative phase.

3. Geography

- a. Because this study was designed to examine the effectiveness of using the silver-level ACRC as a pre-hire screening tool at manufacturing firms in Arkansas, the study is limited by the boundaries of the state of Arkansas.
- b. Results of the study are only applicable to the state of Arkansas.

Delimitations

For this study, the delimitations have been defined as follows:

1. Arkansas Career Readiness Certificate

Although the Career Readiness Certificate program is found in almost every state, this study was focused on the Arkansas Career Readiness Certificate system. The researcher has relationships with officials within the state agency which manages the system and ready access to employers within the state.

2. Governor and State Agency Chief Changes

This research was conducted following recent changes in the Arkansas governorship and turnover of several agency chiefs who have influence on the Arkansas Career Readiness Certificate program. If this study had been conducted prior to those changes or farther in the future, different levels of state and agency engagement might have influenced research outcomes.

3. Bronze, Gold, and Platinum Career Readiness Certificate Levels

The Career Readiness Certificate system includes four primary certificate levels.

The silver-level certificate was chosen over the other levels because it represents

59 percent of the total certificates awarded in Arkansas since the program began.

Assumptions

For the purposes of this study, assumptions were made as follows:

1. Participants in the study, through their interactions with employees who possess an Arkansas Career Readiness Certificate, had adequate experience and knowledge to fully and honestly answer questions related to the certificate's use and effectiveness.
2. The homogeneous nature of silver-level Arkansas Career Readiness Certificate holders was adequate to provide reliable data from multiple employer sources.
3. Employers who have had jobs profiled within the WorkKeys system did so following the profiling structure defined by the State of Arkansas and ACT, Inc.

Scope

The scope of this study was restricted to employers from the manufacturing sector in Arkansas who use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool. From that group of employers, human resource managers were selected to participate and provide information pertaining to their perceptions of the effectiveness of the certificate in relation to employee safety, productivity, and retention.

Definition of Terms

For the purposes of this research, key terms were identified and defined as follows:

Arkansas Career Readiness Certificate (ACRC): An Arkansas Career Readiness Certificate is a portable credential based upon the WorkKeys assessments that demonstrates to

employers that an individual possesses particular workplace skills, including reading for information, applied mathematics, and locating information. The ACRC is specific to Arkansas, but is based on the National Career Readiness Certificate and has reciprocity with other participating states.

National Career Readiness Certificate (CRC): The National Career Readiness Certificate uses three WorkKeys skill assessments to verify to employers that an individual has essential employability skills.

CRC employers: Firms that use the Career Readiness Certificate as a pre-employment qualification and/or assessment for determining applicants' eligibility for employment.

Economic development: The practice of promoting economic growth in a particular geographic region and/or business sector, with particular focus on the role of adequate human capital as a component of attracting new employers to an area.

High-stakes testing: Testing and/or assessment for which passage at a certain level is a requirement for advancement to, or consideration of, a particular outcome for the test taker.

Job profiling: The process of having particular jobs and/or work activities professionally documented and analyzed for the purpose of aligning job-specific skills with associated competencies exhibited by Career Readiness Certificate earners at the varying (bronze, silver, gold) credential levels.

Key performance indicators: Measures and metrics used by firms to track individual employees, work groups, profit centers, etc., for the purpose of determining essential operational efficiencies in areas such as safety, productivity, profit, and overall institutional success.

Manager: A human resource department manager and/or other supervisory personnel who engage in screening potential employees and hiring decisions.

Pre-employment assessments: Tests, checks, and investigations (including cognitive skills testing such as the WorkKeys assessment) used by employers for the purpose of determining job applicants' qualifications and match for open positions.

Qualified workers: Job applicants and/or incumbent workers who possess or exceed minimum skill requirements for a particular job or set of jobs within a particular firm or business sector.

Retention rate: The length of time that employers are able to keep qualified employees at their firm, thereby determining turnover rates for the firm.

Return on investment: The resulting benefit (or lack thereof) associated with investing in pre-employment training, testing, and the use of assessments in determining eligibility for hiring.

Skills gap: The difference between the skill level employers need employees to have and the actual skill level of available workers.

Turnover rate: The number of employees (as a percentage of total employees at a firm) who need to be replaced during a given time period.

WorkKeys skills assessment: WorkKeys is a comprehensive assessment system for measuring, communicating, and improving the common skills required for success in the workplace and is part of the ACT system of assessment tools.

Workplace skills: The set of essential abilities necessary for an individual to perform adequately at a particular job within a firm or business sector.

Operational Definitions

Operational definitions for this study are as follows:

1. The study was focused on the concept of the effectiveness of the silver-level Arkansas Career Readiness Certificate as an indicator of higher performing employees relative to safety, productivity, and retention.
2. Scope of the study was limited in that only manufacturing firms in Arkansas which use the silver-level certificate as a pre-hire screening tool were asked to participate in the study.
3. The primary independent variable in the study was the use of the silver-level certificate as a pre-hire screening tool.
4. The dependent variables included human resource managers' perceptions of employee performance relative to
 - a. Safety
 - b. Productivity
 - c. Retention

Chapter 1 Summary

Chapter I provided background information on issues pertaining to pre-employment assessments and the establishment of the ACT WorkKeys system, the national Career Readiness Certificate, and the subsequent development and implementation of the Arkansas Career Readiness Certificate (ACRC) program. Basic information regarding earnings and employability for ACRC holders was introduced along with the number of ACRC credential earners.

The statement of the problem, purpose of the study, and research questions were identified with focus on the effectiveness of the use of the silver-level ACRC as a pre-hire

screening tool for manufacturing firms in Arkansas. Justification for identification of the population and general information regarding research methodology were provided. Significance, innovative aspects, and anticipated limitations of the study were defined. Key terms relevant to the study were also identified and defined within the chapter.

CHAPTER 2: LITERATURE REVIEW

Introduction

The purpose of this literature review is to identify and discuss current and relevant information related to workplace readiness of prospective employees, skills needed for current and future jobs, pre-hire screening techniques, and how the WorkKeys / Career Readiness Certificate process aligns with and affects those issues. The review provides justification for the study, shows how the study aligns with similar previous research, and helps to refine the study design.

Macro- and Micro-Economic Implications of Screening and Credentialing

During the late twentieth and early twenty-first centuries, the United States economy was seemingly stable, and employment was strong with national annual unemployment averaging less than 6 percent from 1990 through the start of the recession in 2008 (United States Department of Labor Bureau of Labor Statistics, 2016). Economies of developing countries were, however, growing as the United States economy began to sag amid technological advances that made fast-paced global economic expansion possible. These factors combined to highlight a real shortage of skilled workers in the United States and, coupled with other cost/profit motivations, led many employers to shift operations overseas or to replace unskilled workers with automated equipment (Bolin, 2011).

Technical education and assessment play a critical role in supporting local economies and global competitiveness. Having effective education and credentialing systems in place allows for higher employability rates, decreased differences between socio-economic strata within a community, an improved tax base, and a reduced risk of poverty (McLaverty, 2015). Linton (2010) indicated how the skilled worker shortage has been a topic of discussion at national

conferences related to credentialing with emphasis on how the shortage poses a threat to our national economy in the global marketplace.

From a community and economic development perspective, when large numbers of people in a city or region earn a recognized workplace readiness credential, the overall work-ready identity of the community is elevated, thereby making existing business retention and new business recruiting more likely (DuBois & Westerman, 2007).

The direct costs associated with making poor hiring decisions can have serious negative influence on profitability for employers and stability for communities. Costs associated with turnover can reach as much as 200 percent of a bad hire's annual salary, and organizations can suffer from loss of confidence in management when turnover due to poor hires reaches a critical level.

A key position filled by a bad hire can knock an organization back by years, in terms of competitive advantage. The costs surrounding a bad hire can have significant impact on bottom-line results. This is especially so as bad hire outcomes are far more common than most have realized. (Grigoryev, 2006, p. 16)

Beyond the training, cost savings realized by assessing and hiring aptly skilled workers, systematic and comprehensive pre-employment screening provides additional reduction of risk related to that hiring.

Pre-employment screening helps the employer to avoid risk, and to select the potentially most productive candidates. In the pre-employment arena alone, proper screening is valuable in combating loss due to theft, injury, ineptitude, drug and alcohol abuse, insurance claims and negligent hiring law-suits. (Wang & Kleiner, 2004, p. 101)

In 2011, United States President Barack Obama introduced an initiative to significantly increase the number of community college students earning manufacturing-related credentials and degrees in an attempt to offset the potential economic crisis associated with the upcoming retirement of 2.7 million manufacturing sector employees over 55 years old. The program, in

conjunction with the National Association of Manufacturers, has workplace readiness credentialing as a foundational component along with industry-specific credentials, certificates, and degrees (Bolin, 2011).

The History of Pre-employment Screening

Pre-screening prospective employees is not a new concept. “The need for some means to select, evaluate, and promote the people who work in large and important organizations has been recognized for centuries” (Hersen, 2004, p.1). Beginning with civil service examinations in China over 2,000 years ago, the practice of pre-screening potential employees has matured over time. By the fourteenth century, the Chinese had added multi-hurdle qualifications to their screening techniques, and by the early twentieth century, had applied psychological profiling to determine personal attributes of individuals seeking employment was in widespread use (Hersen, 2004).

Beginning with the colonial era in the United States, apprenticeship systems were prevalent for many skilled trade areas. By the eighteenth century, apprentices were beginning to branch out to more traditional academic pursuits to supplement the skills training gained through the apprenticeship system. With the growth of industry in the nineteenth century, the apprenticeship model was no longer adequate for producing the numbers of skilled workers needed to meet production and market demands (Hurst, 2008). The industrial revolution caused further decline to the apprenticeship training model as the division of labor among workers who were assigned to very specific repetitive tasks required very little training to be productive (Hendrickson, 2014).

The production of adequate numbers of skilled workers through workplace skills training and testing in the United States has its roots in federally-initiated programs and laws. Beginning

with the Smith-Hughes Act of 1917, the United States government has endeavored to provide performance-based accountability for occupational education through a series of legislative mandates and incentive-based programs. Hallmark legislation such as the Employment Act of 1946, the Manpower Development and Training Act of 1962, the Vocational Education Act of 1963, the Comprehensive Employment and Training Act of 1973, the Job Training and Partnership Act of 1982, and the Carl D. Perkins Act of 1984 established a pattern of government involvement in attempts to develop and maintain a skilled workforce to support the economic demands of the country (Border, 1998). Subsequent reauthorizations of the Carl D. Perkins Act and the Workforce Investment Act of 1998 (replacing the Job Training and Partnership Act of 1982) continued the government's involvement in coordinating and incentivizing workforce education. The Workforce Innovation and Opportunity Act of 2014 replaced the Workforce Investment Act of 1998 and is focused on reducing skills gaps, enhancing employment services, improving literacy, and providing assistance for dislocated workers (Ginn, 2015).

In recent years, certification and credentialing systems have become more prevalent for use in assisting prospective employees prepare for employment opportunities and for employers to use as pre-screening tools. As more employers have given preferential consideration to those prospects with work-ready credentials (thereby reducing the amount of time required and costs associated with on-the-job training), job seekers have been motivated to acquire additional credentials prior to applying (Carter, 2005).

The Purpose of Current Pre-Screening

In order to address the ongoing shortage of qualified employees, effective workforce development and assessment systems must be developed and maintained (Westray, 2008). While applications, interviews, and reference checks may have provided adequate information in the

past for hiring managers, current jobs require additional pre-hire evidence to facilitate effective screening. In the late twentieth century, the contraction of the manufacturing sector, coupled with increasing globalization, led employers to enhance their pre-employment screening techniques through the recognition of industry-specific certification exams. To better identify and place appropriately skilled workers in the few jobs available, employers have more frequently turned to private organizations (i.e., the Manufacturing Skill Standards Council) that offer certification services (Carter, 2005).

One of the hallmarks of modern economic development efforts includes the ability to prove that sufficient numbers of appropriately skilled workers are available to support new or expanded industrial operations. A major component of attracting and retaining high-growth jobs is to “provide individuals with the capabilities and verification of capabilities” (DuBois & Westerman, 2007, p. 535) necessary for those jobs. Pre-employment assessments that are rooted in the specific job opening, particularly if adequate job analysis or profiling has been completed, may lead to better success in hiring followed by higher rates of retention (Hendrick, 2006).

Having systems to educate and assess the workplace readiness skills of the workers within a community or region is essential for effective recruiting and retention of employers that offer competitive wages and benefits. Areas with higher levels of educational attainment show greater economic growth than those with below-average attainment levels. Growth due to the presence of a qualified workforce can lead to competitive advantages for communities where employers from multiple sectors invest due to confidence in their ability to source adequate talent (Sleezer, 2004).

Attempting to predict future performance is an ongoing and challenging process for human resource development professionals. Current techniques for identifying qualified and

productive staff are often seen as less than successful when contrasted with retention and performance metrics. Cascio and Aguinis (2008) suggested that pre-employment assessment systems are often limited in efficacy due to too narrow a focus on behavioral consistency (or lack thereof) that may not be predictive of job performance, inattention to employee attributes that may lead to adverse outcomes, unrealistic expectations of financial gain as a result of using a particular assessment system, and the lack of global applicability of the assessment across an organization.

For credentialing programs to work, employers must embrace, support, and regularly use the credential as a pre-hire or promotion determinant. While many states have systems for promoting work-ready credentials to employers (i.e., state workforce services agencies, unemployment services agencies, workforce development boards, etc.), educational institutions and credentialing centers are often the front-line promoters of the credential as a viable tool for assessing incumbent and future workers and including that knowledge in placement decisions (Hyslop, 2008).

Connell and Phillips (2003) presented a recommended managerial approach to address employee retention with exploration of several issues pertaining to managing retention as an imperative strategic initiative. They contended that effective screening and hiring (coupled with proven retention practices) mitigates the negative impact of turnover in an organization which can undermine critical strategic goals and often includes major consequences as follows: high financial cost, productivity losses and workflow interruptions, low service quality, loss of expertise, loss of business opportunities, disruption of social and communication networks, reduced job satisfaction of remaining employees, and damage to the image of the organization.

Some research in recent years has attempted to determine the most effective pre-employment screening techniques. Casillas, Robbins, McKinniss, Postlethwaite, and Oh (2009) reviewed and summarized numerous studies and reports examining integrity tests (measuring indicators such as dependability, honesty, and trustworthiness) vs. traditional aptitude measures (including the Career Readiness Certificate) and found at least one study by Schmidt and Hunter (1998) that indicated using integrity tests as a selection tool "...provides the greatest incremental validity above general mental ability tests..." (p. 119).

Proper credentialing, along with company-specific pre-employment testing, is seen as the best method for identifying applicants with the best fit and skill set for a particular job (Agard, 2003). There are, however, detractors from the notion of credentialing and testing as perfect predictors of hiring success. Lakes (2011) reviewed claims and counterclaims regarding the viability of work-ready assessments and the significance of workplace literacy skills. Management teams routinely state the desire for a reliable method for determining that potential employees have the necessary skills for high-tech and globally competitive jobs. Lakes argued that despite the claims of pre-employment assessment authors that their instruments are scientifically capable of providing proof of individual worker talent, overall job competency cannot be rendered down into a singular assessment tool.

Pre-employment screening is routinely used to verify an applicant's identity, ensure that s/he is legally eligible for a position, to check his/her education and work history, and to see if s/he meets minimum physical capacity to perform a job. Employers continue to increase and enhance their pre-screening techniques relative to job-specific competencies in an effort to identify skills gaps in prospective employees.

Skills Gaps

Grey and Herr (1998) explained that the purposeful enhancement of job skills was seen as a societal imperative throughout the industrial revolution. The “skills-employability paradigm” (p. 9) equates gainful employment with reduced criminal activity, individual self-sufficiency, and improved overall positive human development. The paradigm has been accepted almost universally and continues to be the prominent model for workforce education and training that leads to jobs and plays a central role in providing upward mobility and reduced criminality. Similarly, workforce education is the common remedy for displaced workers and those individuals in lower socio-economic strata.

Three levels of essential workplace skills have been identified by Grey and Herr (1998). Essential work ethic and behavior, essential academic skills, and essential occupational and advanced workplace literacy skills comprise the interconnected set of necessary attributes for workforce education to provide effective and comprehensive worker skills upgrades.

Essential work ethic and behavior is the foundation level upon which the other two levels are dependent. Competency in job-specific skills areas is not adequate if an employee does not exhibit basic work ethic and behaviors related to key elements as follows: attendance, punctuality, compliance, cooperation, honesty, attitude, and dependability.

Essential academic skills are the basis for being able to expand job-specific skills. Fundamental understanding and skills related to “reading for comprehension, mathematics, science, and both writing and oral communications” (Grey & Herr, 1998, p. 179) is required in order to comprehend the more complex concepts and required critical thinking associated with many operational tasks.

Essential occupational and advanced workplace literacy skills are critical for advancing efficiency and opportunity for individual and organizational growth. Occupational skills are those task-specific practices necessary for completing work with precision and being productive. These skills range from physical to cognitive and may be transferrable from one occupation to another. Advanced workplace literacy skills encompass individual attributes which lead to the ability to make critical decisions and are dependent on an employee's capacity to learn on his own, solve problems, work as part of a team, work in diverse groups, work with computers, and be systems-minded.

In 2010 and 2011, as the effects of the Great Recession culminated in record levels of unemployment, the National Association of Manufacturers reported that a third of American manufacturing firms were still struggling to fill open positions (Manufacturing Institute, 2011). Skills required for employment were simply not prevalent among prospective employees applying for those positions (Sullivan, 2012). Compounding the situation was a continued shift to service and knowledge-based job opportunities with the manufacturing sector suffering from that shift more than most (Short, 2011).

Employers report that the majority of new hires do not have requisite skills for today's jobs with four out of five businesses noting less than adequate numbers of fully proficient employees (Greene, 2008). General knowledge, i.e., reading, writing, and mathematics, continues to be the basic expectation of employers in the manufacturing sector as hiring managers consider potential new hires. In many sectors, employers are focused on expanded cognitive abilities such as critical thinking skills, problem solving, and proficiency using a computer (Hurst, 2008). "Manufacturers continue to cite critical shortages in technical skills,

inadequate basic employability skills, and...in production and the direct support of production, including engineering and skilled crafts” (Westray, 2008, p. 1).

Martin (2009) identified the common reasons employers are likely to eliminate applicants for entry-level manufacturing positions amid a constant struggle to identify and retain those employees. Basic technical skills and knowledge, basic communication skills, and basic workplace readiness skills (attendance, timeliness, work ethic, etc.) were ranked consistently by employers as the minimum requirements for developing a productive and reliable employee base.

In a survey of employers regarding new and current employees, Morrison (2011) identified the top six most prevalent serious skill deficiencies. Table 1 illustrates the percentage of employers which indicated particular skills as a serious problem.

Table 1

Serious Skill Deficiencies of Employees

Skill Deficiency	% of Employers Indicating this Skill as a Serious Problem
Inadequate problem-solving skills	52%
Lack of basic technical training (degree, industry certification, or vocational training)	43%
Inadequate basic employability skills (attendance, timeliness, work ethic, etc.)	40%
Inadequate technology / computer skills	36%
Inadequate math skills	30%
Inadequate reading / writing / communication skills	29%

Major Reports and Publications Related to Essential Workplace Skills

A large number of significant reports exists regarding skills gaps and the evolution of strategy and theory around how to best address those gaps. Following is a review of several key publications in this area of study.

In 1981, the United States Secretary of Education formed a commission with the goal of determining the state of education in the United States. *A Nation at Risk* was published by the commission in 1983 and was one of the first reports to raise concern about globalization and the possibility of the United States' being passed by due to poor educational attainment and lack of educational standards (National Commission on Excellence in Education, 1983).

The report indicated a number of risk factors including comparison of United States student achievement to that of other countries, high numbers of functionally illiterate teens and adults, and dropping scores on standardized tests. The need for remedial education in colleges, universities, and the military was also identified as a cause for concern. The report's authors expressed fear that the country was entering a pattern of generational decline in educational and economic attainment (National Commission on Excellence in Education, 1983).

The authors of *A Nation at Risk*, based on a sense of urgency, made recommendations for improvements in curriculum, standards, time spent on educational basics, teaching techniques, and changes to leadership and fiscal support. In terms of curriculum, the report recommended strengthening basic requirements in five areas as follows: English, mathematics, science, social studies, and computer science (National Commission on Excellence in Education, 1983).

In 1987, The Hudson Institute and the United States Department of Labor released *Workforce 2000: Work and Workers for the 21st Century*. This report focused more on national and global economies and the issues surrounding an aging workforce. The authors identified six

primary challenges facing policy makers at that time. Those challenges included stimulating balanced world growth; accelerating productivity issues; maintaining the dynamism of an aging workforce; reconciling the conflicting needs of women, work, and families; integrating Black and Hispanic workers fully into the economy; and improving the education and skills of all workers.

Workforce 2000 relegated education to the end of the report with less than two pages of the 117-page report dedicated to the topic. The authors did reference the need for dramatically increased educational standards with a focus on abilities to “read sophisticated materials, read clearly, speak articulately, and solve complex problems requiring algebra and statistics” (Johnson & Packer, 1987, p. 116).

In 1990, the American Society for Training and Development and the United States Department of Labor undertook a research project related to essential workplace skills. The resulting report, *Workplace Basics: The Essential Skills Employers Want*, identified 16 skills that employers want and how those skills impact organizational success. Table 2 illustrates the categorization of essential skills areas and the specific skills aligned with each category (Carnevale, Gainer, & Meltzer, 1990).

Also in 1990, the National Center on Education and the Economy partnered with the Commission on the Skills of the American Workforce to research and publish *America's Choice: High Skills or Low Wages*. The report indicated that employers were concerned about being able to find appropriately-skilled workers to fill current and future openings with 80 percent of those employers expressing a critical concern in their inability to find prospective employees with appropriate work ethic, reliability, teamwork, and attitude (National Center on Education and the Economy, 1990).

Table 2

Essential Skills Identified in Workplace Basics

Essential Skills Category	Essential Skills Within the Category
Foundation Skill	Learning to Learn
Skills on Which Technical Competence is Built	Reading, Writing, Computation
Effective Communication	Oral Communication, Listening
Adaptability Skills	Problem Solving, Critical Thinking
Developmental Skills	Self Esteem, Motivation/Goal Setting, Employability/Career Development
Group Effectiveness Skills	Interpersonal Skills, Teamwork, Negotiation
Influencing Skills	Organizational Effectiveness, Leadership

America's Choice also illustrated employers' frustration "that a large number of their employees do not possess the elementary capability to read a production schedule or follow an instruction card" (National Center on Education and the Economy, 1990, p. 24). The employers which participated in this study, however, were less concerned about basic and job-specific technical skills and more concerned about finding employees who were "reliable, presentable, and who communicate well on the job" (National Center on Education and the Economy, 1990, p. 26).

In 1991, the United States Secretary of Labor, through an appointed commission, developed and published the Secretary's Commission on Achieving Necessary Skills (SCANS) report. SCANS included recommendations for supporting a high-performance economy through the training and assessment of high-skill employees to fill high-wage jobs. Tables 3 and 4

illustrate the primary skills categories identified in SCANS (The Secretary's Commission on Achieving Necessary Skills, 1991).

Table 3

US Secretary of Labor Commission on Achieving Necessary Skills (SCANS) Fundamental Skills

Basic Skills	Thinking Skills	Personal Qualities
Reading	Creative Thinking	Responsibility
Writing	Decision Making	Self-Esteem
Mathematics	Problem Solving	Sociability
Listening	Seeing Things in Mind's Eye	Self-Management
Speaking	Knowing How to Learn	Integrity / Honesty
	Reasoning	

Boyett and Conn's 1991 book *Workplace 2000: The Revolution Reshaping American Business* discussed what the authors saw as the future of the American workplace including emphasis on future workplace culture, information sharing, worker motivation, compensation, leadership, productivity, quality, innovation, and education. In the section devoted to education, the authors indicated a looming crisis of worker shortages due in large part to their perception of a failed education system in the United States.

Workplace 2000 reiterated Carnevale, Gainer, and Meltzer's (1990) position from *Workplace Basics* regarding the critical knowledge and skills necessary for employees to be effective and productive. It also explored the transition from a world where human value was determined by how much physical work a person could perform to a world where cognitive and critical thinking abilities are more valued. The authors concluded the book's section on workplace education with the admonition that all workers will need to possess higher skills and

that achievement of those skill upgrades are the responsibility of individual (Boyett & Conn, 1991).

Table 4

US Secretary of Labor Commission on Achieving Necessary Skills (SCANS) Workplace Competencies

Resources (Identifies, organizes, plans, and allocates resources)	Interpersonal (Works with others)	Information (Acquires and uses information)	Systems (Understands complex inter- relationships)	Technology (Works with a variety of technologies)
Time	Participates as Member of a Team	Acquires and Evaluates Information	Understands Systems	Selects Technology
Money			Monitors and Corrects Performance	Applies Technology to Task
Material and Facilities	Teaches Others New Skills	Organizes and Maintains Information		
Human Resources	Serves Clients / Customers	Interprets and Communicates Information	Improves or Designs Systems	Maintains and Troubleshoots Equipment
	Exercises Leadership Negotiates	Uses Computers to Process Information		
	Works with Diversity			

Ten years after publishing *Workforce 2000*, The Hudson Institute in 1997 released the sequel to that report titled *Workforce 2020: Work and Workers in the 21st Century*. While the 1987 report had very little information regarding workforce education, the subsequent report paid much more attention to education including the influence of skills education on earnings; the uncertainty of higher education's impact on earnings; potential skills gaps in growth industries; how skills and education relate to diversification; and how job training and education can lead to upward mobility (Judy & D'Amico, 1997).

Workforce 2020 indicated that future jobs would offer higher wage rates but that in order to be eligible for those jobs, prospective employees would need to increase skill levels in three primary areas as follows: reasoning development, mathematical development, and language development. The authors also addressed the need for improved secondary education standards with required high levels of attainment in reading, writing, math, reasoning, and computing (Judy & D'Amico, 1997).

The National Center on Education and the Economy followed up the previously mentioned *America's Choice* report with a 2008 skills report titled *Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Worker*. In this updated review of the status of necessary workplace skills for current and future jobs, the Commission focused on the impact of globalization and the tactics the United States will have to embrace in order to remain competitive in that global marketplace (National Center on Education and the Economy, 2008).

Tough Choices noted that all levels of employees will need to have higher skill levels in the traditional knowledge areas of English, mathematics, science, and technology and the traditional workplace skills of teamwork, adaptability, and ability to learn. The report goes further than previous similar reports by suggesting that knowledge and skills rooted in literature, history, and the arts will also be critical for employees to be valued as contributors to global competitiveness for their employers. *Tough Choices* also suggested that efficient and productive employees will have inherent skills relative to abstract thought, analysis, synthesis, creativity, and innovation (National Center on Education and the Economy, 2008).

Tough Choices offered ten recommended steps to ensure that public policy, fiscal decisions, and educational offerings are adequate to facilitate necessary improvements for global

competitiveness. One of the ten steps suggests that every adult worker should have access to skills upgrades in the new workplace literacy. Through universal access to content based on high standards of comprehension, large numbers of workers with fewer prospects for advancement will have new opportunities. The presumed result from that new access will be increased productivity, competitiveness, and an improved overall economy for the nation (National Center on Education and the Economy, 2008).

Similarities exist within each of the major reports referenced in this section and over the quarter century that these reports span, two common themes are consistent. First, basic reading, writing, communications, and mathematics are seen as critical for all jobs at all levels. Second, the need for basic workplace readiness was consistent throughout with reliability, teamwork, and interpersonal skills listed as core essentials. Over time, the minimum standards for essential skills matured and expectations increased to include attributes such as critical thinking skills, effective decision making, adaptability, and capacity for abstract thought.

Importance of Soft Skills

Nearly 50 percent of new hires do not meet the expectations of their employers due to shortcomings in the non-technical aspects of the job. As a result, many employers are expanding their pre-hire protocols to include consideration of overall competency, compatibility, and a prospective employee's ability to positively impact the company's broad organizational goals. Employers deploy competency models through detailed job profiling, which includes technical and non-technical skills analyses (Grigoryev, 2006).

In addition to basic reading, writing, and mathematics, employers continue to rank workplace readiness skills ahead of technical skills in the level of importance for new

employees. The most important non-academic workplace skills identified by employers include professionalism, communication, collaboration, and problem-solving skills (Shultz, 2011).

Grey and Herr (1998) spoke to the foundational importance of ensuring that employees possess soft skills because without them, employee retention is negatively affected even if traditional academic and job-specific skills are present. Work habits, people skills, general behavior, and personal values all form the basis by which an employee approaches assignments and challenges. For some employers, including hospitality and high-tech industries, the soft skills are trending higher in level of importance with customer service, communication, and the ability to work in a team identified as equally or more important than the requisite basic skills (Hurst, 2008).

When employers rank the need for employees to possess applied skills vs. basic knowledge, the results show that soft skills rank high in areas identified as most important to those employers. As illustrated in Table 5, Casner-Lotto and Barrington (2006) identified those employer-defined preferences by assembling employer feedback based on education attainment level of new employees.

Effective pre-screening and testing for soft skills requires a thorough understanding of the competencies necessary for the position. Tests for soft skills should be research-validated “whenever possible to get a quick baseline reading of an applicant’s aptitude in key areas of the job, including high priority soft skills” (Tulgan, 2015, para. 9).

Table 5

Employers' View of Relative Importance of Skills of New Hires by Education Attainment Level

Rank	For new entrants with a high school diploma	For new entrants with a two-year college/technical school diploma	For new entrants with a four-year college diploma
1	Professionalism / Work Ethic	Professionalism / Work Ethic	Oral Communications
2	Teamwork / Collaboration	Teamwork / Collaboration	Teamwork / Collaboration
3	Oral Communications	Oral Communications	Professionalism / Work Ethic
4	Ethics / Social Responsibility	Critical Thinking / Problem Solving	Written Communications
5	Reading Comprehension	Reading Comprehension	Critical Thinking / Problem Solving
6	English Language	Written Communications	Writing in English
7	Critical Thinking / Problem Solving	English Language	English Language
8	Information Technology	Ethics / Social Responsibility	Reading Comprehension
9	Written Communications	Information Technology	Ethics / Social Responsibility
10	Diversity	Writing in English	Leadership

A Review of Pre-Screening Instruments

Along with the ACT WorkKeys assessment system, Stone (2007) identified a number of other currently used and widely recognized work competency assessment instruments.

Following is a brief description of each of the assessments referenced by Stone.

The Adult Measure of Essential Skills (AMES) is a norm-referenced set of assessments designed to evaluate basic educational and workplace skills for adults in reading, communication, computation, and applied problem solving. AMES is designed to work with adults regardless of high school diploma attainment status and is seen as an effective tool for measuring essential workplace skills. Research is lacking regarding the validity of the test (Hersen, 2004).

The Assessments in Career Education (ACE) program is part of the state of California's broader Career-Technical Assessment Program. ACE includes end-of-course assessments of basic competencies in five vocational areas including technology, agriculture, computer science, healthcare, and food services / hospitality. Developed collaboratively by educators and industry representatives, the test is administered at no cost to students but is fairly narrow in focus with its limited content areas (Contra Costa Special Education Local Plan Area, 2013).

The Career Portfolio Assessment (CPA) measures standard workplace readiness skills such as communication, problem solving, and personal management. The CPA, which includes a formal certification, is used by secondary schools as an assessment and by employers as a pre-screening tool. This assessment includes a wide variety of assessment areas and is adaptable to needs of specific schools or regions but includes high costs for teacher/test facilitator training (WestEd, 1999).

The Comprehensive Adult Student Assessment System – Employability Competency System (CASAS-ECS) identifies appropriate placement levels in work-related technical training programs. For employment purposes, this assessment aids in identifying basic competencies in reading, listening, mathematics, critical thinking, and communications skills. This assessment can be used for special education students or students with communication deficiencies but is

seen as assessing skills at levels lower than what employers expect for entry level positions (WestEd, 1999).

The National Occupational Competency Testing Institute (NOCTI) Job Ready assessments include written and performance elements. These assessments, available in a variety of career or vocation focus areas, measure skill and understanding at the job level based on 13 employability areas and are appropriate for use in educational (secondary or post-secondary) and workplace settings. Although these assessments provide a variety of options, they are more expensive than similar testing options (National Occupational Competency Testing Institute, 2006).

The Workplace Success Skills System is managed and marketed by AccuVision and uses prospective employee responses to video and computer based job simulations to determine potential for success in particular jobs. The assessment measures competencies in soft skills and technical skills including interacting with others, trainability, structuring work activity, listening skills, and interpretation of information (AccuVision, n.d.).

The Career Readiness Certificate, part of the ACT, Inc., WorkKeys system provides analysis of an individual's competency in reading for information, locating information, and mathematics. The Career Readiness Certificate and WorkKeys are discussed in detail later in this chapter.

The ACT, Inc., WorkKeys System

According to ACT, Inc.'s, promotional materials, "ACT WorkKeys is a job skills assessment system that helps employers select, hire, train, develop, and retain a high-performance workforce. This series of tests measures foundational and soft skills and offers specialized assessments to target institutional needs" (ACT, Inc., 2015b, para. 1). WorkKeys

assessments and the accompanying Career Readiness Certificate are currently available in 38 states.

The complete WorkKeys system is designed to allow employers to assess multiple predictors of success through all stages of the employment cycle. Foundational skills, performance, talent, and fit are all measured through the various WorkKeys components to assist employers better identify and place prospective and incumbent employees through the screening, selection, training / development, and succession planning phases of employment (ACT, Inc., 2015a).

Not all certificate-issuing states make use of the full suite of assessments associated with the WorkKeys system. Beyond the three primary content areas (applied mathematics, locating information, and reading for information) assessed for the Career Readiness Certificate, the WorkKeys system has additional optional assessments including applied technology, business writing, fit, listening for understanding, performance, readiness indicator, talent, teamwork, workplace observation, WorkKeys for Healthcare, and WorkKeys Proficiency Certificate for Teacher Assistants (ACT, Inc., 2015c). All states which offer the Career Readiness Certificate also provide reciprocity for certificate holders from other participating states.

In the early stages of WorkKeys assessment development, ACT initially used the Guttman Scaling Technique but later determined that the Item Response Theory scaling method was better suited to the goals of the assessment. The resulting WorkKeys assessment model is criterion-referenced as opposed to norm-referenced. With job-specific criteria built into the assessments, employers using the Career Readiness Certificate as a prescreening tool know that applicants have been assessed on pre-set skill levels rather than comparisons to broader population averages (Stone, 2007). Job seekers who take the WorkKeys assessment and earn a

Career Readiness Certificate are able to compare their individual scores and skills to the certificate and/or skill levels required for particular jobs or careers (ACT, Inc., 2015d).

As part of the complete WorkKeys system, ACT has developed a preliminary assessment to assist in determining if an individual is ready to take the full WorkKeys assessment or if he needs to participate in additional preparation. (“What's New”, 2010). ACT claims that results from the WorkKeys Readiness Indicator assessment will “...provide a reliable estimate that helps identify individuals who are likely to achieve scores of Level 3 or above on operational WorkKeys assessments” (ACT, Inc., 2015e, para. 1).

ACT, Inc., provides an interactive online pre-WorkKeys curriculum designed to assist individuals with development and/or refreshing of foundational skills prior to taking the WorkKeys assessment (ACT, Inc., 2015f). ACT Career Ready 101 is a self-paced, module-based program which is aligned with WorkKeys content for soft skills to prepare for the ACT WorkKeys Talent assessment and for job-specific skills through the ACT KeyTrain suite of WorkKeys preparation content (ACT, Inc., 2015g). Not all WorkKeys states have invested in or require ACT Career Ready 101 as a WorkKeys preparation tool. In Arkansas, individuals must successfully complete the Career Ready 101 process to become eligible to take the WorkKeys assessment (Arkansas Department of Workforce Services, 2015c).

To assist employers in identifying the appropriate WorkKeys skill levels necessary to establish specific and detailed alignment between employees and the jobs into which they are placed, ACT, Inc., uses a job profiling process to define the actual skill requirements of particular jobs. By interviewing and observing groups of incumbent workers, job profilers create comprehensive task analyses for specific jobs, then prescribe the best mix of WorkKeys-

based skill levels most appropriate for new hires and existing workers in performing those jobs (ACT, Inc., 2015h).

WorkKeys job profiling is completed through an on-site, four-step process. Beginning with information provided by the host company, the profiler conducts an initial review and job observation in order to create an initial task list. Using the basic information gathered, interviews of subject matter experts (workers and supervisors) are then conducted to refine and expand the descriptions into accurate, fully defined task analyses and rated as to the critical nature of each task to overall performance of the job. Each required skill within a particular job is then analyzed independently to determine relevance and alignment with skills assessed by WorkKeys. Finally, the profiler prepares a detailed report that validates the link between the job tasks and the recommended WorkKeys skill levels (ACT, Inc., 2015i).

Through the process of compiling all completed WorkKeys Job Profiles, ACT, Inc., has developed a searchable database of occupation profiles based on minimum WorkKeys skill-level criteria and job-profiling data. The WorkKeys occupation profiles found in the database are categorized into job clusters, then cross-walked to the United States Department of Labor / Employment Training Administration's Occupational Information Network (O*NET) program. By networking the WorkKeys profiles with the O*NET system, which uses the Standard Occupational Classification (SOC) taxonomy (O*NET Resource Center, n.d.), employers and job seekers can easily see how an individual's Career Readiness Certificate level aligns with a particular job or set of occupations (ACT, Inc., 2015j).

The Arkansas Career Readiness Certificate Program

Arkansas's involvement in the WorkKeys / Career Readiness Certificate system is managed by the Arkansas Department of Workforce Services. The agency distributes the following information as a general description and benefits of the system:

An Arkansas Career Readiness Certificate is a portable credential based upon the WorkKeys® assessments that demonstrates to employers that an individual possesses the basic workplace skills required for 21st century jobs. Getting a CRC will allow an individual to show prospective employers that he or she possesses the basic skills they are looking for. Even if a job seeker has a high school diploma, GED or post-secondary degree, the Arkansas CRC further verifies that he can handle tasks such as reading instructions and directions, working with figures, and finding information - tasks common in today's workplace (Arkansas Department of Workforce Services, 2015b, n.p.).

While the Arkansas Department of Workforce Services is directly responsible for administration of the Arkansas Career Readiness Certificate program, multiple agencies and entities provide operational and promotional support. Primary partners include the Arkansas Workforce Centers, the Arkansas Department of Career Education, the Arkansas Department of Higher Education, the Arkansas Community Colleges (an association representing community colleges in Arkansas), the Arkansas Department of Education, the Arkansas Economic Development Commission, and the 22 two-year colleges in Arkansas (Arkansas Department of Workforce Services, 2015b).

In the first three years of full operation of the Career Readiness Certificate program in Arkansas, over 30,000 certificates were issued, the program was deployed in 76 high schools, and at least 2,600 employers hired employees who had earned a Career Readiness Certificate (Bolin, 2011). As of October 31, 2015, the total number of Arkansas Career Readiness Certificates issued had reached 64,815. Of that total, 11,289 awards were bronze level

certificates (18 percent), 38,343 were silver (59 percent), 15,069 were gold (23 percent), and 114 were platinum (<1 percent).

The Arkansas Department of Workforce Services tracks the number of Arkansas Career Readiness Certificates awarded by county. Table 6 illustrates the ten counties in Arkansas with the highest number of awards. Certificates awarded in the top ten counties (out of 75) in the state account for over 50 percent of the total awards (Arkansas Department of Workforce Services, 2015a).

Table 6

Arkansas Career Readiness Certificates Awarded – Top Ten Counties in Arkansas

County	Number of Awards	% of Total Statewide Awards
Craighead	6,439	9.9%
Pulaski	5,944	9.1%
Greene	5,098	7.8%
Jefferson	3,163	4.8%
Crittenden	2,973	4.5%
Mississippi	2,102	3.2%
Garland	2,086	3.2%
White	1,838	2.8%
Ouachita	1,828	2.8%
Baxter	1,682	2.5%

As part of its print and internet-based advertising collaterals, the Arkansas Department of Workforce Services markets the benefits of the Career Readiness Certificate to employers (which

align closely to results of employer surveys by Casner-Lotto and Barrington (2006) and Morrison (2011) regarding new hire deficiencies) by emphasizing the information as follows:

The certificate is a nationally recognized portable credential based on the ACT WorkKeys assessments that substantiate to employers that an individual possesses the basic workplace skills they are seeking. Individuals who earn an Arkansas Career Readiness Certificate are automatically eligible for the ACT National Career Readiness Certificate (NCRC). Even if an individual has a high school diploma, GED or a post-secondary degree, the Career Readiness Certificate further verifies that he or she can handle tasks that are common and vital in today's workplace such as finding information, reading instructions and working with figures (Arkansas Department of Workforce Services, 2015b).

Along with employer benefits, the Arkansas Department of Workforce Services promotes the benefits of the Arkansas Career Readiness Certificate to job seekers, educators, and the overall community. Table 7 illustrates the benefits claimed by the agency (Arkansas Department of Workforce Services, 2015b).

For job seekers, additional marketing of the Career Readiness Certificate occurs through online and traditional media outlets along with strong emphasis of the certificate's importance by employees at the agency's one-stop and workforce services centers. The primary message in the Career Readiness Certificate Job Seeker Brochure (Arkansas Department of Workforce Services, 2015a) is as follows:

Whether you're thinking about the next phase of your education, launching a new career or making a transition in your current job, the Career Readiness Certificate can help! Employers across the country are overwhelmed with stacks of applications for only a handful of open positions. Sifting through these applications is time consuming and inefficient. Employers need a way to quickly find individuals with essential, verifiable workplace skills. That's why they're asking job seekers to earn an ACT Career Readiness Certificate.

Table 7

Benefits of the Arkansas Career Readiness Certificate per the Arkansas Department of Workforce Services

For Employers	For Job Seekers	For Educators	For Communities
Reduced turnover, overtime, and waste while increasing morale	Builds confidence that skills meet the needs of local employers	Increases chances that graduates will be hired	Keeps employers from moving entry-level jobs to other cities, states, or countries
Takes the guesswork out of selection decisions	Determines skill improvement and training needs	Enables students to see a reason to take coursework seriously	Decreases unemployment rates
Improves the effectiveness of training dollars	Possesses a portable skills credential that enhances employability and sets the stage for possible career advancement and lifelong learning	Improves students' success in entry-level and subsequent jobs	Improves the quality of life for community residents
Streamlines hiring by including a preferred certificate level in the job postings		Aligns curricula to meet the job skills employers need	Increases the tax base through more profitable business partners
Meets EEOC requirements		Provides a workforce development tool that ensures "no worker is left behind"	Attracts new employers to the state
			Creates a work-ready community to improve the quality of life for residents

Employer Engagement with the Career Readiness Certificate

As the WorkKeys system and the Career Readiness Certificate were gaining traction as being nationally recognized, then ACT Chief Executive Officer Richard L. Ferguson said, "The WorkKeys system has helped businesses reduce turnover, improve morale and boost the bottom line by identifying how well an individual can apply foundational skills in a work setting. These new assessments will add to a company's understanding of how well a person will perform" ("WorkKeys now holds the keys to hiring," 2006, p. 1). Ferguson highlighted how employers

use the WorkKeys system to identify foundational skills, performance, talent, and fit of individual employees during pre-screening or evaluation periods (“WorkKeys now holds the keys to hiring,” 2006).

The claims above from the head of ACT, Inc., can be presumed to be biased in favor of the company and product. There are, however, numerous indicators and examples showing that Ferguson’s statements are supported by ongoing use of the system by employers. Numerous examples show a consistency of reporting and analysis as to how employers and prospective employees value the WorkKeys system as follows:

- The Career Readiness Certificate has gained in popularity among employers and workers since 2008. For employers, the Career Readiness Certificate can serve as a reliable preliminary screening tool for applicants and a way to filter prospects identified by state and local workforce services offices. For job seekers, the certificate allows those new to particular sectors a way of showing core competencies and those experienced workers who may be displaced or looking for advancement a way to complement their documented work history (Bolin, 2011). In many cases, the Career Readiness Certificate is providing the verification element for those efforts (DuBois & Westerman, 2007).
- The Career Readiness Certificate provides an avenue for those individuals with limited education or certifications to improve (through KeyTrain / Career Ready 101 remediation and preparation modules) and show viability as a prospective employee. The certificate, as a “valid, reliable, and legally compliant skills-assessment” (DuBois & Westerman, 2007, p. 536), also provides employers with some evidence of their applicants’ level of self-motivation.

- Employers note numerous benefits from using the Career Readiness Certificate as a pre-employment screening tool. Through job profiling, employers have a keen awareness of the precise skills needed for specific jobs. As certificate holders apply for those jobs, employers are able to make a determination regarding a prospective employee's incumbent skills or his/her need for skills upgrades for particular job duties (Freund, 2013).
- Besides providing a common measurement of foundational skills, the Career Readiness Certificate provides employers with confidence that certificate holders have the basic learning skills needed to start a successful career. In particular, employers in the manufacturing, construction, and energy sectors are finding the certificate to be an effective prescreening tool (Peckham, 2011). In Texas, where the oil and gas industry plays a major role in each of those sectors, prospective employees who hold a Career Readiness Certificate are realizing hiring preference from many employers (Rasmussen, 2014).
- WorkKeys and the Career Readiness Certificate are being used as assessment and credentialing tools as part of overall recruiting and human capital development strategies. For entry-level positions, where prospective employees may have little or no verifiable experience, the Career Readiness Certificate provides employers a level of assurance that the employee has at least basic skills necessary for success in the position (Kaleba, 2007).
- Organizations that strive to create an environment built on employees' ability to think critically, independently, and with an eye toward how individual effectiveness impacts overall team performance often depend on traditional education records such

- as high school diplomas, General Education Development (GED) tests, or college entrance exam scores as indicators of a prospective employee's potential (Bowles, 2004). "The CRC provides a workplace skills certification that businesses can connect directly to productivity, quality, business processes, and profitability" (DuBois & Westerman, 2007, p. 536). For applicants who do not have any of those traditional attainment markers, the Career Readiness Certificate often serves as an indicator of the job seeker's basic skills and ability to fit into the learning organization culture (Bowles, 2004).
- In 2011, a human resource manager at a major plastics and container manufacturer in Arkansas said, "Our business is becoming more and more complex with new technology and customer standards certifications. As a result, the skill level required of employees has increased. The CRC program has given us a way to verify applicants have the prerequisite skills to be successful on the job in a relatively short period of time" (Bolin, 2011).

WorkKeys in Secondary and Post-Secondary Education Programs

The growing gap between education and workplace readiness is prompting many state leaders to reconsider how career education is delivered across secondary and post-secondary institutions. States are using a variety of methods to incentivize the inclusion of work-ready skills training into curricula while increasing reliance on WorkKeys and other work-ready assessments to track the effectiveness of the training (Zinth, 2013). This emphasis on work-readiness training has led to better integration of core subject matter (math, science, language skills) into career-related topics. A higher awareness of the importance of linking core

academics with technical career subjects is, in some cases, breaking down traditional silos between the two areas (Zirkle, 2004).

Employers continue to have an expectation that applicants will possess requisite skills and knowledge prior to being hired. While 19 percent of employers assume at least partial responsibility for assisting new hires to become work ready, the majority (75.6 percent) feel that secondary education providers should be providing and achieving basic workplace readiness preparation (Casner-Lotto & Barrington, 2006). Despite employer expectations that the education system should provide work-ready prospective employees, the private sector, out of necessity, continues to invest in education and workforce readiness at higher levels. Pawlowski (2005) reported annual investment in education and readiness efforts by U.S. companies at \$2.5 billion.

Bowles' (2004) study regarding the alignment (or lack thereof) of post-secondary career preparation and training programs with the employability skills measured by the Career Readiness Certificate showed, at that point in time, that there was only moderate overlap between the two. He questioned why better alignment was not prevalent and why the Career Readiness Certificate was not more widely used as a means for determining eligibility for entrance into industry-related college programs.

Grant (2015) addressed the benefits offsetting the shortage of adequately-credentialed employees by aligning workplace training and industry certifications with college degree pathways.

Although employers continue to seek and reward credentialed employees, nearly half of the U.S. workforce – approximately 50 million adults – has only a high school education or less. At the same time, projections indicate that requirements for education qualifications will rise in the next three to five years across all job categories. Employers, colleges, and universities cannot fill this gap by working in isolation. The need for

productive and robust partnerships among business, industry, and higher education is paramount (Grant, 2015, p. 76).

Some colleges include the Career Readiness Certificate as a key element of their adult education and workforce readiness programs. For example, J. Sargeant Reynolds Community College's (Richmond, Virginia) Middle College program encourages participants to improve their employability by acquiring a Career Readiness Certificate in conjunction with a General Educational Development certificate while taking at least one credit-bearing workforce-related course ("Community College Program Aims," 2006).

WorkKeys and the Career Readiness Certificate are gaining in popularity in many states as a measure of post-secondary career readiness and an adjunct to traditional college readiness exams. Some states, such as Illinois, require the WorkKeys assessment for measuring student performance and to provide common data for analyzing career-ready status of various student populations throughout the state (Mouser, 2014).

In many states, efforts continue to expand Career Readiness Certificate assessments at the high school level. With the goal of having students college and career ready as they graduate, the certificate provides evidence of basic work readiness to students and employers. One high school senior in Georgia, while discussing applying for jobs, said, "That's going to be the first thing I pull out" (para. 5) in an effort to increase his odds of being hired (Gelpi, 2009).

While secondary career and technical education programs reliably provide students with access to relevant workforce readiness, traditional diplomas do not adequately inform prospective employers as to the graduates' skill levels. As such, career and technical education programs are increasing the use of credentials, including the Career Readiness Certificate, to provide evidence and direct connection to employers and/or post-secondary technical education

opportunities. The increase of credentialing at the secondary level is helping to drive the overall growth of work-ready credentialing in many states (Hyslop, 2008)

Despite the increased demand for employees with a two-year degree and/or specialized skills training, trends continue to show an inclination for high school graduates to presume a four-year degree is the best option (Thomas, 2014). “By 2005 only one-fifth of high-school students specialized in an industry, compared with one-third in 1982. The share of 17-year-olds aspiring to four-year college, meanwhile, reached 69% in 2003, double the level of 1981” (“Too narrow, Too Soon,” 2010, para. 3).

With only 40 percent of high school graduates in the United States being deemed “work ready,” it is becoming more evident that secondary education does not include adequate guidance and preparation for current and future career opportunities (Pittman, 2010). Students and parents often place much more significance on an earned high school diploma than do employers (Thomas, 2014).

Holewinski (2012) indicated that students who graduate from high school underprepared for college or the workplace need remediation for either pathway. Some school districts are developing and deploying a career academy model to infuse workplace readiness skills into curriculum and eliminate the need for job-related remediation whether the graduate goes directly to work or to college first.

Despite the push to infuse WorkKeys-related content into the secondary education curriculum and increase the number of high school students who earn a Career Readiness Certificate while in high school, little research has been conducted to determine if WorkKeys scores are a predictor of success in post-secondary education pursuits (Lindon, 2010).

Because the WorkKeys assessments are rooted in workplace-related content and typical college entrance exams (ACT, SAT, ASSET, etc.) are college readiness measures, students' assessment results may be different between the two types of assessments. ACT, Inc., does, however, indicate that high scores on certain sections of the WorkKeys assessment are comparable to certain ranges of scores on the ACT college test. For example, "A Level 5 score on WorkKeys Reading for Information is comparable to an ACT college test score for reading in a range of 19 to 23, a range that is considered college ready" (Schultz, 2011, p. 5).

Other Dissertations Related to WorkKeys

To date, very few doctoral dissertations have focused on some aspect of WorkKeys and/or the Career Readiness Certificate. Following is a brief review of dissertations which include some research element related to the topic.

WorkKeys Scores Relative to Demographics

Barnes (2002) researched differences in WorkKeys scores based on race, gender, and education attainment levels of high school students, community college students, and employees of industrial firms in Dothan, Alabama. Results indicated that race and education level do have statistically significant influence on assessment scores.

Stone (2007) compared WorkKeys assessment scores based on age, race, and gender. With almost 7,000 participants from one testing center in Alabama, Stone found statistically significant assessment results based on age and race. Results related to differences in gender were mixed with only the applied mathematics section of the assessment providing statistically significant results.

WorkKeys Scores Relative to Secondary and Post-secondary Education

Schultz (2011) studied the perceptions of high school juniors regarding the WorkKeys assessment. Students in one school district in Alaska were surveyed at the time they took the assessment to determine their perceptions of the assessment, perceptions of their college readiness, and perceptions of their career readiness.

In a study comparing WorkKeys scores of technical education students at a community college in Mississippi, Belton (2000) researched the difference in scores for one-year technical completers vs. those completing two years. Belton found that students completing two years of school at the college scored at higher levels on the three primary WorkKeys assessment areas (reading for information, locating information, and applied mathematics).

Lindon (2010) conducted research to determine if relationships exist between WorkKeys assessment scores, course grades, and/or cumulative grade point averages of students at seven community colleges. Weak correlations were found to exist between WorkKeys scores and grades in mathematics and reading courses. Correlations were also found between particular WorkKeys sections and grade point averages.

WorkKeys Assessment Relative to Other Assessments

Buchanan (2000) conducted WorkKeys-related research to compare scores of the Tests for Adult Basic Education (TABE) and WorkKeys for incarcerated adults at the Bradshaw State Jail Facility (Texas) with age and pre-incarceration work history used as primary variables. The study found a strong correlation between TABE and WorkKeys and that full-time work prior to incarceration led to higher WorkKeys scores.

In a study designed to determine if WorkKeys is a suitable tool for college entrance and placement for academic courses, Bowles (2004) compared assessment results for WorkKeys and

the ASSET test. Results of the comparison of study participants' assessment scores at Midlands Technical College (South Carolina) indicated that WorkKeys is not a reliable assessment for use in college course placement.

WorkKeys Scores Relative to Employee Retention and Performance

Hendrick (2006) studied the correlation of WorkKeys assessment scores and employee retention rates at twelve employers in six states with primary focus in Virginia. Results of the study indicated that employees who were prescreened using WorkKeys were retained at a higher rate than those who were not.

Greene (2008) surveyed managers at companies in North Carolina that use WorkKeys as a pre-hire screening tool to determine if use of the assessment had any effect on turnover, scrap material, training time, overtime, and teamwork. The study also compared the perception of WorkKeys effectiveness by managers based on company size. "Over half (60 percent) of the managers agreed training time was reduced, 52 percent agreed turnover was reduced; 40 percent agreed teamwork was increased, 36 percent agreed scrap material was reduced, and 17 percent agreed overtime was reduced with the use of WorkKeys" (p. ix). No difference was indicated based on company size.

Previous dissertations focused on aspects of WorkKeys and the Career Readiness Certificate are limited in number and similarity. There is, however, a great deal of overlap of the general topics covered by the other studies and the topics covered in this study's literature review section. Core themes of education, skills gaps, employability, and screening exist across the varied dissertations. This study (with its focus on human resource managers' perceptions of employees with silver-level Arkansas Career Readiness Certificates and those employees' performance related to safety, productivity, and retention) is more closely aligned with the

Hendrick (2006) and Greene (2008) dissertations than the other dissertations reviewed.

Hendrick focused solely on retention rates, and Greene addressed perceptions of managers relative to company-wide performance measures.

Chapter 2 Summary

Chapter 2 provided a review of relevant literature and information related to workplace readiness of prospective employees, skills needed for current and future jobs, pre-hire screening techniques, and how the WorkKeys / Career Readiness Certificate process aligns with and affects those issues. The economic implications and historical relevance of pre-hire screening was examined along with a review of the purpose of pre-screening, the evolution of skills gaps, and the importance of soft skills were examined. Significant reports and publications regarding workforce deficiencies and government-led worker training initiatives were reviewed.

The variety of pre-screening instruments was reviewed with focus on the WorkKeys system and the Arkansas Career Readiness Certificate program. The chapter concluded with information regarding employer engagement with the WorkKeys and Career Readiness Certificate system, how WorkKeys is used in secondary and post-secondary education, and a review of previously submitted dissertations related to WorkKeys.

CHAPTER 3: METHODS

Chapter Overview

The purpose of this mixed methods study was to gather perceptions of the effectiveness of using the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool through a multi-phase survey and interview process with human resource managers at manufacturing firms in Arkansas. Through a combination of quantitative and qualitative data collection and analysis, research was conducted to attempt to determine if use of the silver-level Arkansas Career Readiness Certificate as part of a pre-hiring system is effective in improving retention, safety, and productivity of employees hired through that system.

Explanatory sequential design with a two-phase model was chosen for this study, which allowed for effective comparison of quantitative and qualitative data. This mixed methods study used a combination of quantitative and qualitative data collection and comparison to answer the primary research question with focus on employee performance as related to safety, productivity, and retention. This chapter includes information regarding research design, participants, survey instrument and interview techniques to be used, and data analysis to be conducted.

Research Questions and Hypotheses

The primary question to be answered by this study was this: Do human resource managers at manufacturing firms in Arkansas believe that using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool leads to hiring higher-performing employees? The study was guided by three hypotheses as follows:

Hypothesis 1: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening

tool report no improvement in safety performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 2: H0: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in productivity performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 3: H0: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in retention of employees who earn the certificate as opposed to those who do not.

The second, qualitative phase of the study focused on the perceptions of human resource managers through sub-questions as follows:

1. How do human resource managers perceive the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool as related to employee safety?
2. How do human resource managers perceive the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool as related to employee productivity?
3. How do human resource managers perceive the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool as related to employee retention?

Research Design

Explanatory sequential design with a two-phase (quantitative then qualitative) model was chosen for this mixed methods study, including a post-positivist perspective in Phase I and a constructivist perspective in Phase II (Creswell & Plano-Clark, 2011). This design model allowed for the use of quantitative results to inform interview design in the qualitative phase and to provide a more complete understanding of the issue addressed in the study. The two phases of this study were these:

Phase I: Quantitative data were collected from human resource managers at manufacturing firms in Arkansas through an electronic survey. The population size for Phase I included 58 prospective participants, 23 of whom completed the online survey.

Phase II: Qualitative data were collected by interviewing a subset of the participants from Phase I. The population size for Phase II included 16 prospective participants, nine of whom were interviewed.

Mixed Methods Model

The mixed methods research model was chosen for this study to allow for multiple techniques in acquiring and analyzing data and reporting results for a particular set of questions (Hesse-Biber, 2010). The combination of statistical trends and personal narratives with one phase building upon the other gave equal importance to results from quantitative and qualitative evidence.

This model allowed for the use of quantitative results to inform interview design in the qualitative phase (Creswell & Plano Clark, 2011). Beyond informing the Phase II design, in order to capitalize on the mixed methods model, this research methodology required illustrating

how the qualitative “findings add to, explain, and expand on” the quantitative survey results (Edmonds & Kennedy, 2012, p. 174).

The actual design of the mixed methods research provided the basis upon which the quantitative and qualitative elements were implemented and interpreted (Plano-Clark & Ivankova, 2015). The explanatory sequential design model has many strengths, including its attractiveness to researchers who prefer building their work on a quantitative foundation; its two-phase model, which allows for separate and distinct focus of effort during each phase; its less cumbersome presentation of results for researchers and readers; and its ability to adapt and adjust the second phase appropriately based on information gathered and analyzed during the first phase (Creswell & Plano-Clark, 2011).

As the use of an explanatory mixed methods design gains popularity, a number of elements within the methodology continue to be explored and refined, including “how researchers decide on which method to assign priority in this design, how to consider implementation issues, how and when to connect the quantitative and qualitative phases during the research process, and how to integrate the results of both phases of the study to answer the research questions” (Ivankova, Creswell, & Stick, 2006, p. 4). Table 8 illustrates the basic procedures for developing and implementing an explanatory sequential mixed methods study (Creswell & Plano-Clark, 2011).

For this mixed methods study, data analysis and comparison occurred in three distinct steps. The first round of data analysis was conducted at the conclusion of the Phase I quantitative data collection. Results of this step informed the final design and plans for the Phase II qualitative interviews of a subset from Phase I respondents. The second data analysis

event occurred following the Phase II interviews. Finally, the data from both research phases were combined and compared to prepare and report overall study results.

Table 8

Procedures for developing and implementing an explanatory sequential mixed methods study

Step 1: Design the Quantitative Strand	Step 2: Identify Areas Needing Further Review	Step 3: Design the Qualitative Strand	Step 4: Review Combined Results
Determine questions and approach	Determine which results need to be studied in Phase II	Finalize research questions for Phase II	Summarize results from both phases
Obtain permissions	Refine Phase II strategies	Obtain permissions	Interpret and report on how / if Phase II results further explain the Phase I results
Define Sample	Identify Phase II participants	Select sample which can best explain Phase I results	
Collect data		Collect open-ended data	
Analyze data		Analyze data	

Conceptual Perspective

The Phase I quantitative section of the study was rooted in a post-positivist theoretical perspective. This phase of this project aligned well with this perspective due to the broad nature of explanatory sequential design where not all aspects of the full research project are known before collection of data begins (Ryan, 2006). The post-positivist perspective allowed for uncertainty in the process based on probability instead of certainty (Mertens, 2014) while testing of theories could continue to evolve (Creswell & Plano-Clark, 2011).

The theoretical perspective for the second phase of the study was linked to a constructivist paradigm by allowing the subjective view of participants to determine outcomes as data collected refined and informed Phase I results (Creswell & Plano-Clark, 2011). Because

human interaction can lead to deeper understanding (as compared to simple responses on a survey), the knowledge gained through the qualitative process and a constructivist approach allowed for a more thorough exploration of all data collected (Klenke, 2008).

Population and Sample

Participants for this project were human resources professionals at manufacturing firms in Arkansas which are currently or have recently been using the silver-level Arkansas Career Readiness Certificate as a pre-employment screening tool. Examples of participants' titles included: human resources manager, human resource business partner, director of administration, human resources / safety manager, recruiter, senior human resource analyst, corporate human resource manager and recruiter, human resources director, human resource specialist, and human resource generalist. Each participant was selected for inclusion in this study due to his/her knowledge of the Arkansas Career Readiness Certificate and the use of the certificate at his/her respective company.

The current roster of employers using the Arkansas Career Readiness Certificate provided a more-than-adequate source for identifying potential participants. Appendix A includes the current Arkansas Department of Workforce Services list of employers that use the Arkansas Career Readiness Certificate as a pre-screening or employee evaluation tool. The companies on the list represent those which are officially recognized by the state as partner companies. The list contains 80 companies, 58 of which are manufacturing firms.

Manufacturing firms are identified as the target population for this study for four primary reasons as follows:

1. The Arkansas Career Readiness Certificate has been adopted as a pre-hire screening tool by the manufacturing sector more than by any other employment sectors

- (Arkansas Department of Workforce Services, 2015c). This adoption rate allowed for the best chance of a representative sample.
2. The skills gap in Arkansas is greatest in the manufacturing sector with middle-skill jobs accounting for the most prevalent deficiency rates in the state (DeRenzis & Chang, 2014).
 3. Manufacturing firms are located in all areas of the state. Numerous manufacturing sub-sectors are represented among the 58 firms.
 4. Manufacturing firms range in size (based on number of employees) throughout the state.

Potential participants for the first phase were the human resource managers at 58 manufacturing firms in Arkansas that use the ACRC. All 58 managers were invited to complete the survey, making the sampling technique total population sampling. Of that total population sample, 23 participants completed the online survey for a return rate of 39.65 percent.

Prospective participants for the second phase were the subset of first phase participants who indicated a willingness to be contacted for follow-up questions related to their perceptions of the Arkansas Career Readiness Certificate. This convenience sampling technique provided an adequate sample size with diverse representation of company size and geographic location. The target sample size for the second phase was originally planned for between ten and fifteen participants. Sixteen Phase I participants indicated willingness to be contacted for follow-up. From that group, ten agreed to be interviewed. One of the ten eventually declined to be interviewed, resulting in nine interviews being conducted.

Protection of Human Subjects

Adhering to basic ethical principles when conducting research involving human subjects begins with well-reasoned, accurate, and timely completion of necessary documents and procedures (i.e., Institutional Review Board approval, informed consent, etc.). As research commences, however, the researcher must exhibit an ongoing understanding of ethical requirements and conduct the study in a way that is consistent with sensitivity to research ethics (Marshall & Rossman, 2014). This study was conducted within the general ethical guidelines of non-maleficence by minimizing the risk of harm, following proper informed consent protocols, protecting anonymity and confidentiality, avoiding deceptive practices, and providing the right to withdraw (Lund Research, 2012).

The protocol for the collection of all data were governed by the University of Arkansas Institutional Review Board and the University's *Policies and Procedures Governing Research with Human Subjects* (University of Arkansas, 1999). Ultimately, conducting ethical research requires the researcher to strive to develop relationships with participants built on respect, trust, and understanding (Rubin & Rubin, 2011).

Quantitative Data Collection Procedure

As part of an explanatory sequential design mixed methods study, data were gathered in two phases providing quantitative results from the first phase and qualitative results from the second phase. Through the combination of exploratory quantitative and qualitative questions, a more complete understanding of the issue is possible (Creswell & Plano Clark, 2011).

Phase I quantitative data were gathered from human resource managers by an electronic survey designed to explore the hypotheses listed above. The instrument used in this study

included a combination of demographic questions about the participant and the firm he/she represents, and perception-related items measured by 5-point Likert-type responses.

The survey was developed by adapting an existing related survey instrument. The validated instrument from Greene (2008) provided the foundation and framework for the hypothesis-related questions in the instrument used in this study. Appendix D includes approval from Dr. Greene to use and amend her instrument for this study. Appendix E provides a comparison of the Greene (2008) instrument questions and how those items were adapted for this study.

Use of a survey allowed for generalization of information from the sample and provide quantified indication of participant perceptions (Creswell, 2009). Gathering data through this type of survey also provided the opportunity to explore the relationship between variables based on a cross-sectional model with individual input from a homogeneous group (Punch, 2003).

The survey was formatted and administered through the University of Arkansas online survey system, Qualtrics, and was distributed to participants through a link in an email with results compiled by the online survey service platform.

Quantitative Survey Description

Appendix C includes the questions included in the two-section quantitative survey instrument. Questions in the first section of the Phase I survey included demographic questions regarding the participant's position, the type of firm, the size of the firm, and the firm's history of using the Career Readiness Certificate as a pre-hire screening tool. Information gathered in this section served as foundational information for purposive sampling in the second phase.

The second section of the survey included 5-point Likert-type items which address participants' perceptions regarding how the use of the Career Readiness Certificate affects hiring

higher-performing employees. This section focused on employee performance as related to safety, productivity, and retention. Likert-type summated rating scales survey items are appropriate for ascertaining perceptions by allowing participants to indicate whether they strongly disagree, disagree, are undecided, agree, or strongly agree with various statements related to the topic (Ary, Jacobs, Razavieh, & Sorensen, 2009).

The final question of the survey allowed participants to indicate their willingness to participate in Phase II of the study.

Quantitative Survey Pilot Testing

Pilot testing the quantitative online survey prior to distribution to the study participants allowed the researcher to receive feedback from the test participants regarding question comprehension, sequencing, non-response issues, sensitivity issues, and any difficulties in technical processes (Lavrakas, 2008). Using the same communication methods and online environment for the pilot test as for the final survey, the researcher was able to identify time requirements and procedural complications and correct them during the test phase, thereby providing an improved experience for the research participants (Fink, 2016).

Pilot test participants for the quantitative survey phase of this study were chosen from Arkansas companies which use the Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool but were not part of the pool of employers used in the actual study. As part of the pilot test process, participants were given the opportunity to provide feedback and suggestions for improving the survey. Participants suggested that employers were unlikely to have hard data to report and that the responses would indeed be perceptions. One participant said, "Most of the questions will be someone's best guess or an opinion." Following pilot testing, no changes to

instrument structure or language were required as test results revealed no threats to validity or reliability.

Quantitative Survey Reliability

In order to obtain data with high reliability, surveys must be designed in a way that ensures responses will be consistent over time if subjects are asked the same questions through multiple surveys (Punch, 2003). Reliability in measurement through the survey instrument is critical to arriving at trustworthy and untainted conclusions (Muijs, 2004). As such, “The measures contained in the survey instrument must be designed in a clear and unambiguous way to ensure that the respondent would answer the item in the same way if s/he were asked to repeat the exercise” (Andres, 2012, p. 123). Reliability also provides an essential foundation for data validity (Newman & McNeil, 1998).

To ensure reliability in the quantitative phase of this study, Chronbach’s Alpha was calculated for the scaled-choice items in this study’s survey instrument. Chronbach’s Alpha is appropriate for use as a reliability index, and by calculating the average correlation among all Likert-type question responses, internal consistency (or lack thereof) can be identified (Newman & McNeil, 1998).

Chronbach’s Alpha was calculated for all Likert-type questions collectively, and by subcategory for safety, productivity, and retention. For all scaled-choice items, reliability was measured at .96. The safety sub-category was measured at .90. The productivity subcategory was measured at .89. Finally, the retention subcategory was measured at .85. Chronbach’s Alpha results for this instrument indicate that questions in the instrument are sufficiently inter-related, homogeneous, and reliable (Tavakol & Dennick, 2011).

Quantitative Survey Validity

By adapting an existing validated survey instrument for use in this study, each of the primary types of validity were satisfied (Bulmer et. al, 2006). Research is considered valid when the study is an accurate representation of the stated investigative goals (Smart & Paulson, 2011). In determining the survey instrument for the quantitative phase of this study, three primary types of validity were considered (Balnaves & Caputi, 2001).

1. “Construct validity is the extent to which your constructs are successfully operationalized and represent the phenomenon you want to study” (p. 89). Because this study focused on perceptions of participants, consideration was given to each instrument item to ensure that question and response options allowed participants to adequately express their perceptions.
2. “Internal validity is the extent to which your research design really allows you to draw conclusions about the relationship between variables” (p. 89). By having similar questions about each of the three areas of focus for the study (safety, productivity, and retention) in the instrument, comparisons across topics were possible.
3. “External validity is the extent to which your sample is genuinely representative of the population from which you have drawn it” (p. 89). Achieving a representative sample was achieved in this study by using a total population sampling method.

Quantitative Sample Selection

Participants for this project were human resource managers at manufacturing firms in Arkansas which are currently or have recently been using the silver-level Arkansas Career Readiness Certificate as a pre-employment screening tool. Using the Arkansas Department of Workforce Services list of employers which use the Arkansas Career Readiness Certificate as a

pre-screening or employee evaluation tool (Appendix A), the researcher attempted to contact each manufacturing firm on the list and identify the human resources staff person with the most knowledge of how the Arkansas Career Readiness Certificate is used at his/her respective firm. The resulting list of human resource managers (and their contact information) served as the basis for the quantitative phase population.

Quantitative Survey Administration

Initial communication with Phase I participants was conducted primarily through telephone conversations with follow-up communication and survey correspondence conducted through email. In the initial telephone conversation, prospective participants received basic biographical information regarding the researcher and a description of the purpose of the project.

Informed consent forms were integrated into the survey instrument and distributed to participants through the Qualtrics web-based survey platform. Participants were instructed to indicate consent by clicking the embedded hyperlink taking them to the start of the survey. Qualtrics was also the system by which survey responses were gathered and stored.

After completion of the survey, data files were downloaded from Qualtrics and stored on a password protected computer maintained by the author. A separate document with a code key for personally identifiable information was kept in a restricted-access location away from survey data documents. All physical documents were maintained in a locked file cabinet to which only the researcher had access. All electronic documents were stored in password protected files.

Confirmation emails were sent to each participant who completed the survey. Follow-up emails were sent to participants who indicated a willingness to complete the survey but had not done so by the established initial timeline for completion.

Quantitative Data Analysis

To identify central tendencies, width of distributions, and shape of distributions in the quantitative data, descriptive statistics were used for each Likert-type item (Jackson, 2015). Each item was scored and analyzed independently for frequencies, percentages, and averages through univariate analysis to summarize and find patterns in the data. Descriptive statistics were used to organize data, describe population characteristics, and identify outliers (Salkind, 2010).

Qualitative Research Approach

A responsive evaluation methodology combined with a constructivist theoretical perspective was used to guide the qualitative phase of the study. Responsive evaluation, as a general method, orients the researcher to the personal experience of the participants through interactivity, understanding their surroundings and common experiences, and seeking out context (Stake, 2004).

Rooted in pragmatism, responsive evaluation provides knowledge and insight relative to procedural effectiveness and the difference between anticipated outcomes vs. actual outcomes (Savin-Baden & Major, 2013). Use of this approach during the qualitative phase aligned with the overall research question of the study with particular relevance to perceptions of human resource managers of employees who have earned an Arkansas Career Readiness Certificate prior to being hired.

Qualitative Data Collection

Phase II qualitative data were gathered by conducting interviews of a subset of the human resource managers who were surveyed during the quantitative data gathering phase of this study. Interviews allowed for deeper exploration of relevant experiences and opinions of participants

(Rubin & Rubin, 2011). In-person interviews were identified as the preferred technique with Phase II participants, but time and distance restrictions dictated that the majority of interviews be conducted by telephone despite potential negative effects on rapport, ability to observe nonverbal cues, and contextual interpretation of responses (Novick, 2008). Evidence of lower quality data production through telephone interviews is lacking (Novick, 2008), and with proper preparation, telephone interviews can be used effectively for qualitative interviews (Sturges & Hanrahan, 2004).

The Phase II interviews helped determine to what extent the quantitative survey data accurately represent current sentiment among human resource managers at manufacturing firms in Arkansas, further explain the quantitative results, and increase the overall level of understanding of the effectiveness of using the silver-level Career Readiness Certificate as a pre-hire screening tool. This shift from quantitative to qualitative included the shift from post-positivism to constructivism, which provides the lens through which the phased transition is viewed (Creswell & Plano Clark, 2011).

As prescribed in the explanatory sequential design (Creswell & Plano-Clark, 2011), interview questions for Phase II were not determined until Phase I data were reviewed. Categories of questions for this phase included items focused on expanding responses related to perceived benefits of using the Career Readiness Certificate as a pre-hire screening tool.

Specific questions regarding safety, productivity, and retention were used to elicit deeper understanding of participant perceptions. Based on initial responses, participants were asked to provide specific examples of instances where use of the Career Readiness Certificate as a screening tool had a measurable or perceived effect on one of those three employee performance issues. Appendix G contains the interview questions used in Phase II.

Qualitative Interview Model

A semi-structured interview model was used for the qualitative phase of the study. In a semi-structured model, the interviewer establishes a predetermined set of questions to guide the conversation but has the flexibility to explore additional questions that arise based on participant responses (Savin-Baden & Major, 2013). Similar to Patton's (2002) interview guide, the semi-structured model allows the interviewer to "build a conversation with a particular subject area, to word questions spontaneously, and to establish a conversational style but with the focus on a particular subject that has been predetermined" (p. 343).

This model is appropriate when only one interview is possible with each participant and allows the researcher to determine the best direction for the conversation to move as participants share unique perspectives (Savin-Baden & Major, 2013). Rubin and Rubin (2011) referred to this model as *responsive interviewing*. They recommended approaching participants as "conversational partners" (p. XV), which allows the researcher to understand meaning from the participants' words and establish better rapport.

Interview pilot testing occurred with two human resource managers who were not part of the study population. Pilot testing of the interview model and questions allowed the researcher to review question wording, participant comprehension of the questions, sensitivity issues, proper order of the questions, and to become more comfortable and familiar with the process prior to conducting interviews with study participants (Magnusson & Marecek, 2015). No changes to the interview protocol were necessary following pilot testing.

Qualitative Interview Procedures

In order to conduct effective interviews, adequate planning and preparation by the interviewer was necessary (Savin-Baden & Major, 2013). Beyond establishing adequate

questions and plans within the interview model, the interviewer was prepared to simultaneously keep the conversation moving forward appropriately, to listen well, and to observe the participant.

For this study, each interview (whether in-person or by telephone) began with ensuring that the participant understood that the process was designed to be a conversation with the goal of further illuminating the data gathered in the first phase of the study. The pre-determined guiding questions began with broad research questions then narrowed to more specific questions based on participant responses. Being able to adjust the course of the interview during the conversation is an essential skill for the interviewer if he is to gather as much useful information as possible from the participant (Mason, 2002).

Qualitative Interview Field Notes

Note taking during interviews was an essential element of effective qualitative research (Savin-Baden, 2013). When done properly, descriptive note taking fills in informational gaps pertaining to the interview environment, the participant's disposition, and other non-spoken attributes of the interview that may not be captured otherwise. Notes taken during the interview can also remind the interviewer to explore a topic later in the interview based a response from the participant (Patton, 2002).

For this study, interviews were recorded with a digital recording device. Field notes were taken during the interview, reviewed immediately following the interview, and expanded with additional information remembered by the interviewer. The field notes assisted in analysis of the recordings, locating information at specific points during the transcription process, and provided backup material in the event that a portion of the recording was inaudible (Patton, 2002).

Qualitative Interview Transcription Techniques

Interviews conducted for this study were recorded, transcribed verbatim, then edited for clarity. Editing was completed to a “comprehensible core” (p. 65) to eliminate fragments, incomprehensible phrases, etc., while retaining the participant’s own words (Powers, 2005). Transcripts were also edited to eliminate any personally identifiable information about the participant and the location of the interview in order to protect anonymity and confidentiality.

Each transcript includes actual interview date and time information, anonymized personal information for the participant, and a biographical sketch of the participant’s educational and work history. Interviewer and participant comments are preceded by their initials (pseudonym for the participant) with the interviewer’s comments indicated by bold text.

The following transcription key was utilized to assist in interpretation during initial verbatim transcriptions.

1. Pauses of three seconds or fewer after which the same thought continues are indicated by three dots (...).
2. Pauses of three seconds or fewer after a false start or before a new thought in mid-sentence are indicated by five dots (.....).
3. New thoughts beginning in mid-sentence without a pause are indicated by a dash (-).
4. Pauses of four seconds or more are noted in square brackets throughout the transcript.
5. Explanatory notes of the interviewer are also enclosed in square brackets.
6. Non-standard pronunciation (kinda, wanna, goin’, ‘cause, etc.) is transcribed in only such cases where it is unmistakable on the recording.

Transcripts, field notes, and related coding documents are being maintained securely and accurately through the combination of a systematic file naming protocol and multi-site electronic and physical storage. New versions of documents resulting from modifications to originals were saved adjacent to originals with appropriate naming conventions.

Organizing Qualitative Data

Following data organization, a summary narrative was created through the process of segmenting and labeling text (coding) within each transcript, developing themes by combining common codes, and drawing connections across similar themes (Creswell, 2015). Codes were identified through an emic construct which allowed participants' comments and descriptions guide the code development process (Lett, 1990).

First stage coding for this study was conducted through an initial (open) coding model, which allowed transcripts to be broken into unique sections and compared while allowing the researcher to be guided by emerging themes (Saldaña, 2009). Initial coding aligns with this responsive evaluation study due to its open-ended and exploratory nature by allowing the researcher to be more attuned to “participant language, perspectives, and worldviews” (Saldaña, 2009, p. 48).

Second stage coding for this study was conducted through focused coding, which identified the prominent and significant themes which have the closest connection to the intent of the study. Focused coding aligned with the first-stage initial coding and allowed for comparison of new codes which arose from multiple participants during the second stage of coding (Saldaña, 2009). This dual-stage coding strategy supports the pragmatic research approach by allowing for exploration of anticipated vs. actual outcomes.

Interview transcripts and accompanying field notes were coded in each stage using a multi-pass technique. Any additional documents collected during the interview process (i.e., company records, participant information concerning their own credentials, etc.) was also coded. Through the two stages of coding, categories and subcategories coalesced and allowed for comparative analysis (Saldaña, 2009).

Hallmarks of Quality in Qualitative Research

Several indicators of quality in research must be present in order to consider a study to be ethically sound (Flick, 2008). In order to exhibit trustworthiness, the researcher must convince those who participate in or review the study that the information is valuable (Lincoln & Guba, 1985). For this study, trustworthiness was developed and exhibited through fairness, balance, and a willingness to accept differing perspectives, interests, and realities throughout all interactions with participants (Patton, 1990). For reviewers of this work, trustworthiness is established by providing thorough descriptions and explanations of participants, participant roles within their organizations, data collection methods, and all details regarding data collection phases (Shenton, 2004).

Rigorous research requires accountability within the realities of the flexible nature of qualitative studies (Padgett, 2008). That accountability depends greatly on the credibility of the researcher and his exhibited skill in crafting and managing the study “which is dependent on training, experience, track record, status, and presentation of self” (Patton, 1990, p. 552). For this study, credible results were obtained through purposeful and mindful engagement in the work itself and vigilant monitoring of the project to ensure accountability and rigorous review throughout (Lincoln & Guba, 1985).

Transferability of qualitative research refers to the way in which results may be considered in context to broader concepts. There is no expectation that qualitative results be generalizable to other situations (Ravitch & Carl, 2015). Those wishing to transfer this context to other situations will be able to do so confidently based on the purposive sampling, effective interview techniques, and sound data analyses exhibited in this work.

Dependability in qualitative research “suggests that research findings will endure over time” (Savin-Baden & Major, 2013, p. 475). To achieve dependability in this study, the researcher remained open to changes throughout the entire project and refined techniques and analysis strategies to accommodate those changes (Conrad & Serlin, 2006). While changes in interview technique were not necessary throughout the project, analysis and coding strategies were adjusted to achieve improved understanding of the data as initial coding passes and review were not adequate. Therefore, energy and emphasis was placed on extracting data through additional focused coding passes.

Researcher subjectivity is a natural influence on qualitative research. The research design, data collection and analysis, and reporting of results are all contrived and conducted by the researcher (Lichtman, 2013). Contrary to traditional objectivity expectations in scientific research, the subjective nature of qualitative studies requires that the researcher disclose any known biases which might influence management of the study and interpretation of the data collected (Stake, 2010). No known direct biases existed for the researcher. Common biases, such as confirmation bias, culture bias, and leading question bias were controlled and minimized through constant review and reevaluation of participants, being cognizant of the researcher’s cultural and content assumptions, and avoidance of assuming meaning in responses that is not indicated by participants (Sarniak, 2015).

Chapter 3 Summary

Chapter 3 provided the approach, framework, and detail for the research and analysis methods to be used in this study. Broad methodology and strategy topics, including the research questions and hypotheses, the overall research design, the mixed methods model, and conceptual perspectives for this study, were reviewed. The population and sample for each phase of the study were identified and details concerning protection of human subjects were discussed.

Information related to the quantitative phase of the study was provided regarding data collection, the survey instrument, and pilot testing. Sample selection details for the first phase were discussed along with planned survey administration strategies. Validity and reliability testing for the survey was discussed along with planned quantitative data analysis.

Information related to the qualitative phase of the study was provided regarding the research approach, data collection, interview techniques, and interview transcript coding and analysis. Issues related to research quality, including trustworthiness, rigor, transferability, dependability, and researcher subjectivity were discussed.

CHAPTER 4: RESULTS

Chapter Overview

The purpose of this mixed methods study was to gather the perceptions of human resource managers at manufacturing firms in Arkansas regarding the effectiveness of using the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool. Using an explanatory sequential mixed methods design with two phases (quantitative followed by qualitative), research was conducted to attempt to determine if use of the silver-level Arkansas Career Readiness Certificate (ACRC) as part of a pre-hiring system is effective in improving retention, safety, and productivity of employees hired through that system.

Results from the Phase I survey responses and the Phase II interviews address the primary research questions regarding human resource managers' perceptions about the effectiveness of using the ACRC. Additional perceptions from participants related to the certificate and how it is used and viewed within their companies are also included.

For the quantitative phase, data were collected from human resource managers at manufacturing firms in Arkansas through electronic survey. Surveys were distributed and collected in September and October of 2016. For the qualitative phase, data were collected by interviewing a subset of the participants from Phase I. Qualitative interviews were conducted in December of 2016 to further explore the primary research questions and to allow participants to share opinions of the Arkansas Career Readiness Certificate which were not captured through the Phase I survey process.

Participants

Participants for this project were human resource managers at manufacturing firms in Arkansas that are currently or have recently been using the silver-level Arkansas Career Readiness Certificate as a pre-employment screening tool. The Arkansas Department of Workforce Services roster of employers using the Career Readiness Certificate as part of the hiring process (Appendix A) includes 58 manufacturing firms. The population for this study consisted of those 58 firms.

Human resource managers from 23 firms within the population completed the Phase I online survey. The survey included a question asking if the participant was willing to be contacted for a follow-up interview, and 16 of the 23 participants agreed to be contacted. From that subset, nine individuals were interviewed during the Phase II qualitative portion of the study. Interaction with participants included a combination of telephone and email communication for participants in both phases. Additional interaction with Phase II participants occurred through the interview process. As a group, participants in both phases presented an eagerness to share their perceptions. Several participants had experience with the certificate at more than one employer. Those participants were able to add additional layers of insight by comparing their experience with the certificate through the lens of different management team dynamics.

Table 9 includes general information regarding participants and their titles, company location, and number of employees. All participants represent manufacturing firms in Arkansas. Details about manufacturing type and product were omitted due to the high variability of the firms represented. The unique nature of products at many of the participants' companies could be easily recognized, thereby compromising confidentiality. There was no adequate

homogeneity across product types to categorize the employers for the purpose of analysis based on manufacturing type or product.

Table 9

Participant Information

Participant Name (pseudonym)	Participant Phase I	Participant Phase II	Position	Location	Number of Employees
Mary Newman	X	X	Human resource manager	Northeast Arkansas	1,100
Viola Treece	X	X	Human Resources Specialist	Northeast Arkansas	420
Shaun Weingart	X		Human Resources Director	Southeast Arkansas	120
Shona Drewes	X		Human resource manager	Northeast Arkansas	200
Beverly Bazan	X		Office / Human Resources	Southwest Arkansas	15
Lance Cox	X	X	Human resource manager	Southwest Arkansas	625
Ross Purkey	X		Training Manager	Central Arkansas	300
Edward Stitt	X		Human Resources Generalist	Southeast Arkansas	1,000
Wanda Jackson	X	X	Human Resources Generalist	Northwest Arkansas	77
Brigette Leedom	X		Corporate Human resource manager	Central Arkansas	400
Veronica Jones	X	X	Manager of Human Resource Services	Southwest Arkansas	800

Table 9 Continued

Participant Name (pseudonym)	Participant Phase I	Participant Phase II	Position	Location	Number of Employees
Elizabeth Young	X	X	Human resource manager	Southwest Arkansas	240
Lucie Eells	X		Human Resources Generalist	Northeast Arkansas	250
Jacquelynn Fiero	X		Senior Human Resources Analyst	Southwest Arkansas	655
Steffanie Tam	X		Human Resources Recruiter	Northeast Arkansas	950
Barry Jenkinson	X		Human resource manager	Northeast Arkansas	691
Teddy Kish	X		Human Resources & Safety Manager	Central Arkansas	99
Alene Matheny	X		Human Resources Specialist	Central Arkansas	500
Jose Marling	X		Owner	Central Arkansas	10
Renee Fulks	X	X	Director, Administration	Northeast Arkansas	484
Catherin Michaels	X		Corporate Human resource manager	Central Arkansas	250
Lyle Shiller	X	X	Human Resources Business Partner	Central Arkansas	500
Nancy Dirks	X	X	Human resource manager	Central Arkansas	346

Table 10 presents the employer size range for Phase I participants. Employer size ranged from 10 to 1,100 with an average employee count of 435. The 251 to 500 size interval had the highest number of companies represented with seven. The 1,001 to 1,250 size interval had only one company represented.

Table 10

Number of employees at surveyed companies

<u>Number of Employees</u>	<u>Count</u>
0 – 100	4
101 – 250	5
251 – 500	7
501 – 750	3
751 – 1,000	3
1,001 – 1,250	1

N = 23. *Note:* Average number of employees at surveyed companies = 435

Table 11 presents the geographic region of Arkansas in which the participants' employers are located. All areas of the state were represented with a higher concentration of participants located in the central and northeast regions of the state. The central region consists of six mid-state counties, including Faulkner, Hot Spring, Garland, Lonoke, Pulaski, and Saline. The remainder of the state is divided into four regions by Interstate 40 running east/west through the state, and by an imaginary north/south line running through Little Rock. The central region counties are not part of the four *corner* regions.

Table 11

Geographic location of companies surveyed

<u>Answer</u>	<u>%</u>	<u>Count</u>
Central Arkansas	34.78	8
Northeast Arkansas	30.43	7
Northwest Arkansas	4.35	1
Southeast Arkansas	8.70	2
Southwest Arkansas	21.74	5

 N = 23

Primary Research Question

The primary question to be answered by this study was: Do human resource managers at manufacturing firms in Arkansas believe that using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool leads to hiring higher-performing employees? The study was guided by three hypotheses:

Hypothesis 1: H0: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in safety performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 2: H0: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in productivity performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 3: H0: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in retention of employees who earn the certificate as opposed to those who do not.

For each of the 5-point Likert-type questions in the Phase I survey, response counts and percentages are presented in table form. Sample size, mean, and standard deviation for each question are also presented as footnotes to each question's corresponding table in order to provide additional information regarding central tendency and variability.

Table 12 below summarizes the sample size, mean, and standard deviation for all Likert-type questions within subcategories of safety, productivity, and retention. For questions related to safety, means ranged from 2.83 to 3.32 with an average mean of 3.12. Standard deviation for safety-related questions ranged from 0.84 to 1.19. Z tests were calculated for all safety-related questions, and no statistically significant variability ($P < .05$) was found.

For questions related to productivity, there was a wider range of means when compared to safety-related questions. Productivity-related question means ranged from 2.61 to 3.61 with an average mean of 3.28. Standard deviation for productivity-related questions ranged from 0.84 to 1.19. Z tests were calculated for all productivity-related questions, and no statistically significant variability ($P < .05$) was found.

For questions related to retention, the range of means was more narrow when compared to safety and productivity-related questions. Retention-related question means ranged from 3.09 to 3.43 with an average mean of 3.25. Standard deviation for retention-related questions ranged from 1.0 to 1.12. Z tests were calculated for all retention-related questions, and no statistically significant variability ($P < .05$) was found.

For all question categories, the average mean exceeded the median of the answer scale (3 on a scale of 1 to 5) with safety at 3.12, productivity at 3.28, and retention at 3.25. Z tests for each category indicated no significant variability among responses.

Table 12

Summary data for Likert-type questions categorized by question topic

Questions Related to Safety	N	M	SD
Question 12: Use of the silver-level Career Readiness Certificate reduces violations of safety protocol	23	3.22	1.04
Question 13: Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of workplace safety to the company's bottom line	22	3.32	.84
Question 16: Use of the silver-level Career Readiness Certificate reduces safety training time of employees	23	2.83	1.19
Question 19: Use of the silver-level Career Readiness Certificate reduces employee injuries	23	3.13	.92
Question 24: Use of the silver-level Career Readiness Certificate results in team members working out safety problems with their team	21	3.10	1.04
Questions Related to Productivity			
Question 14: Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of productivity to the company's bottom line	23	3.61	1.03
Question 17: Use of the silver-level Career Readiness Certificate as a pre-hire screening tool reduces production training time of employees	23	3.26	1.14
Question 18: Use of the silver-level Career Readiness Certificate reduces reworks in production	23	3.57	1.16
Question 20: Productivity goals are more consistently met with use of the silver-level Career Readiness Certificate	23	3.52	1.08
Question 21: Use of the silver-level Career Readiness Certificate reduces overtime	23	2.61	.84
Question 22: Use of the silver-level Career Readiness Certificate increases teamwork	23	3.17	.94
Question 25: Use of the silver-level Career Readiness Certificate results in team members working out production problems with their team	22	3.32	1.04

Table 12 Continued

	N	M	SD
Question 26: Use of the silver-level Career Readiness Certificate results in team members communicating more effectively with their team	22	3.55	.91
Question 27: Has your company's decision to use the Career Readiness Certificate provided	23	2.87	1.36
Questions Related to Retention	N	M	SD
Question 11: Use of the silver-level Career Readiness Certificate decreases employee turnover	23	3.22	1.00
Question 15: Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of high retention rates to the company's bottom line	23	3.43	1.12
Question 23: Use of the silver-level Career Readiness Certificate results in team members working out interpersonal problems with their team	22	3.09	1.06

N = Sample size M = Mean SD = Standard Deviation

Safety

The Phase I survey included five questions directly related to participants' perceptions of the effectiveness of the Arkansas Career Readiness Certificate (ACRC) as related to employee safety. The following tables are presented with results from the quantitative survey alongside relevant themes which emerged from the Phase II interviews.

For Hypothesis 1 (*H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in safety performance of employees who earn the certificate as opposed to those who do not.*), results from analysis of safety-related responses fail to reject the null hypothesis.

Table 13 presents Phase I results related to the ACRC's use as an effective method to reduce violations of safety protocol. Thirty-nine percent of participants indicated that they

agreed or strongly agreed that safety protocol violations were reduced while 17 percent disagreed or strongly disagreed. Forty-three percent were uncertain whether there was a reduction in violations as a result of using the ACRC as a pre-hire screening tool.

Table 13

Question 12: Use of the silver-level Career Readiness Certificate reduces violations of safety protocol

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	8.7	2
Agree	30.43	7
Undecided	43.48	10
Disagree	8.7	2
Strongly Disagree	8.7	2

N = 23, M = 3.22, SD = 1.04

Table 14 presents Phase I results related to the ACRC's use as an effective method to hire employees who realize the importance of workplace safety to the company's bottom line. Forty percent of participants indicated that they agreed or strongly agreed that employees realized the importance of safety while nine percent disagreed or strongly disagreed. Fifty percent were uncertain whether employees realized the importance of safety as a result of using the ACRC as a pre-hire screening tool.

Table 15 presents Phase I results related to the ACRC's use as an effective method to reduce the amount of necessary safety training time of employees. Thirty percent of participants indicated that they agreed or strongly agreed that safety training time for employees was reduced while 43 percent disagreed or strongly disagreed. Twenty-six percent were uncertain whether

safety training time for employees was reduced as a result of using the ACRC as a pre-hire screening tool.

Table 14

Question 13: Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of workplace safety to the company's bottom line

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	4.55	1
Agree	36.36	8
Undecided	50.00	11
Disagree	4.55	1
Strongly Disagree	4.55	1

N = 22, M = 3.32, SD = .84

Table 15

Question 16: Use of the silver-level Career Readiness Certificate reduces safety training time of employees

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	8.7	2
Agree	21.74	5
Undecided	26.09	6
Disagree	30.43	7
Strongly Disagree	13.04	3

N = 23, M = 2.83, SD = 1.19

Table 16 presents Phase I results related to the ACRC's use as an effective method to reduce employee injuries. Thirty percent of participants indicated that they agreed or strongly

agreed that employee injuries were reduced while 13 percent disagreed or strongly disagreed. Fifty-seven percent were uncertain whether employee injuries were reduced as a result of using the ACRC as a pre-hire screening tool.

Table 16

Question 19: Use of the silver-level Career Readiness Certificate reduces employee injuries

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	4.35	1
Agree	26.09	6
Undecided	56.52	13
Disagree	4.35	1
Strongly Disagree	8.70	2

N = 23, M = 3.13, SD = .92

Table 17 presents Phase I results related to the ACRC's use as an effective method to improve the frequency that team members work out safety problems within their teams. Thirty-eight percent of participants indicated that they agreed or strongly agreed that employees work out safety issues with their teams while 23 percent disagreed or strongly disagreed. Thirty-eight percent were uncertain whether team-based safety solutions were found as a result of using the ACRC as a pre-hire screening tool.

For safety-related questions from the Phase I survey, average responses indicated that 36 percent of participants agreed or strongly agreed that the Arkansas Career Readiness Certificate has a positive effect on hiring higher-performing employees as related to safety. Twenty-one percent disagreed or strongly disagreed while 43 percent were undecided. "Undecided" was the most common response in all of the safety-related questions.

Table 17

Question 24: Use of the silver-level Career Readiness Certificate results in team members working out safety problems with their team

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	4.76	1
Agree	33.33	7
Undecided	38.10	8
Disagree	14.29	3
Strongly Disagree	9.52	2

N = 21, M = 3.10, SD = 1.04

Through Phase II interviews, additional perceptions related to safety were gathered from human resource managers. Prevalent themes emerging from safety-related comments included uncertainty, the importance of good decision-making skills as related to safety, and the impact of a pervasive company culture of safety.

Three of the participants indicated uncertainty as to whether the Arkansas Career Readiness Certificate (ACRC) is connected in any way to employee safety. Lance Cox said, “I don’t know if it makes a difference one way or another for us.” Veronica Jones stated, “I don’t know how I would measure that as directly related.” Nancy Dirks indicated that she did not have “any strong opinion one way or the other.” Those comments support the Phase I responses related to safety in that “undecided” was the most common response in all of the safety-related questions.

Four participants expressed strong opinions that the ACRC has no impact on employee safety. In their experience, the ACRC had no correlation to safety, and no difference in overall safety performance was discernable as a result of adding the ACRC as a screening tool.

Comments such as, “I don’t think the CRC impacts that” from Mary Newman and “It’s really not tied to the CRC” from Renee Fulks were prevalent in the Phase II interviews.

For those participants who indicated some positive impact on employee safety through use of the ACRC, the effect was attributed to other qualities of ACRC holders that led to improved safety performance such as better awareness of the work environment and better decision-making skills. The concept of improved safety due to other attributes was not part of the Phase I survey but emerged during the Phase II interviews. In their opinion, a company culture focused on safety was much more important than the ACRC. Comments such as, “We do our own internal safety training, and it’s very ingrained in our employees” from Renee Fulks and, “No, really, I believe that the safety is actually a company culture” from Wanda Jackson were indicative of the perception that company culture is more important than having employees with the ACRC. Nancy Dirks asserted, “A better indicator...from a safety perspective is previous manufacturing experience.”

Comments from Viola Treece such as, “There is a difference because of the knowledge, the awareness, the skill set” and, “It goes back to their awareness” indicate the opinion that at least some of the resulting safety benefit is due to other skills possessed by certificate holders. Ms. Treece also indicated that employees with higher ACRC scores were less likely to be injured on the job.

Productivity

The Phase I survey included nine questions directly related to participants’ perceptions of the effectiveness of the Arkansas Career Readiness Certificate as related to employee productivity. The following tables are presented with results from the quantitative survey alongside relevant themes which emerged from the Phase II interviews.

For Hypothesis 2 (H_0 : *Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in productivity performance of employees who earn the certificate as opposed to those who do not*), results from analysis of productivity-related responses fail to reject the null hypothesis.

Table 18 presents Phase I results related to the ACRC's use as an effective method to hire employees who realize the importance of workplace productivity to the company's bottom line. Sixty-five percent of participants indicated that they agreed or strongly agreed that employees realized the importance of productivity while nine percent disagreed or strongly disagreed. Twenty-six percent were uncertain whether employees realized the importance of productivity as a result of using the ACRC as a pre-hire screening tool.

Table 18

Question 14: Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of productivity to the company's bottom line

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	13.04	3
Agree	52.17	12
Undecided	26.09	6
Disagree	0	0
Strongly Disagree	8.7	2

N = 23, M = 3.61, SD = 1.03

Table 19 presents Phase I results related to the ACRC's use as an effective method to reduce the amount of necessary production training time of employees. Fifty-two percent of participants indicated that they agreed or strongly agreed that production training time for

employees was reduced while 26 percent disagreed or strongly disagreed. Twenty-two percent were uncertain whether production training time for employees was reduced as a result of using the ACRC as a pre-hire screening tool.

Table 19

Question 17: Use of the silver-level Career Readiness Certificate as a pre-hire screening tool reduces production training time of employees

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	8.7	2
Agree	43.48	10
Undecided	21.74	5
Disagree	17.39	4
Strongly Disagree	8.7	2

N = 23, M = 3.26, SD = 1.14

Table 20 presents Phase I results related to the ACRC's use as an effective method to reduce the amount of rework in production. Fifty-seven percent of participants indicated that they agreed or strongly agreed that rework in production was reduced while 13 percent disagreed or strongly disagreed. Thirty percent were uncertain whether rework in production was reduced as a result of using the ACRC as a pre-hire screening tool.

Table 21 presents Phase I results related to the ACRC's use as an effective method to more consistently meet productivity goals. Sixty-one percent of participants indicated that they agreed or strongly agreed that production goals are more consistently met while 13 percent disagreed or strongly disagreed. Twenty-six percent were uncertain whether production goals were more consistently met as a result of using the ACRC as a pre-hire screening tool.

Table 20

Question 18: Use of the silver-level Career Readiness Certificate reduces reworks in production

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	21.74	5
Agree	34.78	8
Undecided	30.43	7
Disagree	4.35	1
Strongly Disagree	8.70	2

N = 23, M = 3.57, SD = 1.16

Table 21

Question 20: Productivity goals are more consistently met with use of the silver-level Career Readiness Certificate

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	13.04	3
Agree	47.83	11
Undecided	26.09	6
Disagree	4.35	1
Strongly Disagree	8.70	2

N = 23, M = 3.52, SD = 1.08

Table 22 presents Phase I results related to the ACRC's use as an effective method to reduce overtime. Nine percent of participants indicated that they agreed or strongly agreed that overtime is reduced while 35 percent disagreed or strongly disagreed. Fifty-seven percent were uncertain overtime was reduced as a result of using the ACRC as a pre-hire screening tool.

Table 22

Question 21: Use of the silver-level Career Readiness Certificate reduces overtime

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	0.00	0
Agree	8.70	2
Undecided	56.52	13
Disagree	21.74	5
Strongly Disagree	13.04	3

N = 23, M = 2.61, SD = .84

Table 23 presents Phase I results related to the ACRC's use as an effective method to hire employees who perform better in a team. Thirty-five percent of participants indicated that they agreed or strongly agreed that employees performed better in a team while 13 percent disagreed or strongly disagreed. Fifty-two percent were uncertain whether employees performed better in a team as a result of using the ACRC as a pre-hire screening tool.

Table 24 presents Phase I results related to the ACRC's use as an effective method to improve the frequency that team members work out production problems within their teams. Forty-five percent of participants indicated that they agreed or strongly agreed that employees work out production issues with their teams while 14 percent disagreed or strongly disagreed. Forty-one percent were uncertain whether team-based production solutions were found as a result of using the ACRC as a pre-hire screening tool.

Table 23

Question 22: Use of the silver-level Career Readiness Certificate increases teamwork

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	4.35	1
Agree	30.43	7
Undecided	52.17	12
Disagree	4.35	1
Strongly Disagree	8.70	2

N = 23, M = 3.17, SD = .94

Table 24

Question 25: Use of the silver-level Career Readiness Certificate results in team members working out production problems with their team

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	9.09	2
Agree	36.36	8
Undecided	40.91	9
Disagree	4.55	1
Strongly Disagree	9.09	2

N = 22, M = 3.32, SD = 1.04

Table 25 presents Phase I results related to the ACRC's use as an effective method to hire employees who communicate better with their team. Fifty-nine percent of participants indicated that they agreed or strongly agreed that employees communicated better with their team while

nine percent disagreed or strongly disagreed. Thirty-two percent were uncertain whether employees communicated better with their team as a result of using the ACRC as a pre-hire screening tool.

Table 25

Question 26: Use of the silver-level Career Readiness Certificate results in team members communicating more effectively with their team

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	9.09	2
Agree	50.00	11
Undecided	31.82	7
Disagree	4.55	1
Strongly Disagree	4.55	1

N = 22, M = 3.55, SD = .91

Table 26 presents Phase I results related to participants' opinions about how their employers' decision to use the ACRC has impacted overall employee performance. Fifty-seven percent of participants indicated that overall employee performance had increased. No participants indicated a decrease in overall performance. Seventeen percent of participants indicated no change and 26 percent were unsure if use of the ACRC resulted in any change.

For productivity-related questions from the Phase I survey, average responses indicated that 48 percent of participants agreed or strongly agreed that the Arkansas Career Readiness Certificate has a positive effect on hiring higher-performing employees as related to productivity. Sixteen percent disagreed or strongly disagreed while 36 percent were undecided.

Table 26

Question 27: Has your company's decision to use the Career Readiness Certificate provided:

<u>Answer</u>	<u>%</u>	<u>Count</u>
Increased overall employee performance.	56.52	13
Decreased overall employee performance.	0.00	0
No change in overall employee performance.	17.39	4
Unsure.	26.09	6

N = 23, M = 2.37, SD = 1.86

Through Phase II interviews, additional perceptions related to productivity were gathered from human resource managers. Prevalent themes emerging from productivity-related comments included better-prepared, more motivated, and more efficient employees. The need for constant improvement was discussed often, and the ACRC was seen as a tool by which improved productivity was being achieved.

Unlike safety, participants indicated much higher levels of certainty about use of the Arkansas Career Readiness Certificate's (ACRC) positive impact on productivity. Veronica Jones mentioned, "I certainly think there's a correlation there" and indicated that productivity

was easier to measure than other aspects of the research. These perceptions align with responses to the productivity-related questions on the Phase I survey where all questions except one (Q21, reduced overtime) saw a majority of responses as “agree” or “strongly agree.”

ACRC holders were seen as having better productivity due to a higher skill level than employees without the certificate. Veronica Jones remarked, “The CRC is evidence of that higher skill level” and, “We know that they have more skills than we knew previous to the CRC.”

Four participants indicated that they often noticed ACRC holders to be better prepared as new hires with fewer productivity-related “issues” than non-ACRC employees. Viola Treece indicated that employees with the ACRC “did have higher performance and do better on their performance evals.” Additional themes that emerged during the Phase II interviews related to skill level, motivation, and qualified candidates are discussed below in the “Overall Performance” section of this chapter.

Contradicting the common theme related to the ACRC and productivity found in Phase I results, Mary Newman provided the opinion that pre-hire testing was not a reliable method for predicting future productivity. She said, “It’s not necessarily correlation between productivity and CRC score.” Ms. Newman also stated, “There’s a lot of brilliant people who can pass a test who may not have the motivation or the drive to ambitions and want to continue to move up or be productive.”

Impact on quality was not a topic explored on the Phase I survey but emerged in the second phase interviews. Three participants mentioned quality production as a key element to be considered alongside productivity and how the ACRC plays an important role in that regard. Elizabeth Young focused on the financial implications of rejected product due to poor quality.

She said, “If you have productivity and you don’t produce a quality product, then it gets rejected and you get poor scores...you lose major money.” Mary Newman mentioned the level of precision necessary for meeting quality expectations when she commented, “We also are very precise in what we do because we make life saving medical products, so it’s really important...our quality is really important.” All who brought up quality production linked the ACRC to quality in a positive light.

Retention

The Phase I survey included three questions directly related to participants’ perceptions of the effectiveness of the Arkansas Career Readiness Certificate as related to employee retention. The following tables are presented with results from the quantitative survey alongside relevant themes which emerged from the Phase II interviews.

For Hypothesis 3 (*H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in retention of employees who earn the certificate as opposed to those who do not*), results from analysis of retention-related responses fail to reject the null hypothesis.

Table 27 presents Phase I results related to the ACRC’s use as an effective method to reduce employee turnover. Thirty-nine percent of participants indicated that they agreed or strongly agreed that employee turnover was reduced while 22 percent disagreed or strongly disagreed. Thirty-nine percent were uncertain whether there was a reduction in employee turnover as a result of using the ACRC as a pre-hire screening tool.

Table 27

Question 11: Use of the silver-level Career Readiness Certificate decreases employee turnover

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	8.7	2
Agree	30.43	7
Undecided	39.13	9
Disagree	17.39	4
Strongly Disagree	4.35	1

N = 23, M = 3.22, SD = 1.00

Table 28 presents Phase I results related to the ACRC's use as an effective method to hire employees who realize the importance of high retention rates to the company's bottom line. Forty-eight percent of participants indicated that they agreed or strongly agreed that employees realized the importance of high rates of retention while 13 percent disagreed or strongly disagreed. Thirty-nine percent were uncertain whether employees realized the importance of high rates of retention as a result of using the ACRC as a pre-hire screening tool.

Table 29 presents Phase I results related to the ACRC's use as an effective method to improve the frequency that team members work out interpersonal problems within their teams. Thirty-two percent of participants indicated that they agreed or strongly agreed that employees work out interpersonal issues with their teams while 23 percent disagreed or strongly disagreed. Forty-five percent were uncertain whether team-based interpersonal solutions were found as a result of using the ACRC as a pre-hire screening tool.

Table 28

Question 15: Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of high retention rates to the company's bottom line

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	17.39	4
Agree	30.43	7
Undecided	39.13	9
Disagree	4.35	1
Strongly Disagree	8.70	2

N = 23, M = 3.43, SD = 1.12

Table 29

Question 23: Use of the silver-level Career Readiness Certificate results in team members working out interpersonal problems with their team

<u>Answer</u>	<u>%</u>	<u>Count</u>
Strongly Agree	9.09	2
Agree	22.73	5
Undecided	45.45	10
Disagree	13.64	3
Strongly Disagree	9.09	2

N = 22, M = 3.09, SD = 1.06

For retention-related questions from the Phase I survey, average responses indicated that 40 percent of participants agreed or strongly agreed that the Arkansas Career Readiness

Certificate has a positive effect on hiring higher-performing employees as related to retention. Nineteen percent disagreed or strongly disagreed while 41 percent were undecided.

Through Phase II interviews, additional perceptions related to retention were gathered from human resource managers. Opinions from managers regarding the impact of the Arkansas Career Readiness Certificate (ACRC) were varied with less certainty across those opinions. Themes that emerged during the interviews included improved retention, the importance of wages on retention, and how better qualified candidates (as indicated by possessing an ACRC) lead to higher retention rates.

Two managers indicated that because their company requires all employees to have the ACRC, there is no way to determine if the certificate is an indicator for turn-over. Lance Cox offered the opinion that because his company had been using the certificate for only a few years that it was too soon to know whether it was impacting retention one way or the other. He said, "It's still too early, and I don't have a good enough sample to really tell you the retention rate."

Elizabeth Young felt that the ACRC did have an impact as long as employees were paid appropriately to their certificate level. Veronica Jones suggested that pay mattered more than the ACRC where retention was concerned. She remarked, "We're the highest paid employer in the area, so retention is probably a moot point." Perceptions about wages and the fact that some companies require the certificate for all employees align with the high percentage of "undecided" responses on the retention-related questions from the Phase I survey.

Four participants indicated a positive change in retention as a result of using the ACRC as a screening tool. Lyle Shiller expressed, "I can't remember the last time I did an exit interview that somebody had one [ACRC]...That means they're probably still out there right now." Wanda Jackson stated, "Yes, it's definitely a positive difference."

Two managers indicated that the positive improvement in retention rates was due to the ACRC providing overall better qualified employees. Elizabeth Young remarked, “You just get a better caliber employee.”

Comparing Safety, Productivity, and Retention

During the Phase II interviews, participants were asked to share their opinion about which of the three primary research areas (safety, productivity, or retention) was most impacted by using the Arkansas Career Readiness Certificate as a pre-hire screening tool. This topic was not part of the Phase I survey.

One manager, Lyle Shiller, had a very strong opinion that safety was most impacted by using the ACRC. He declared, “Safety. No doubt. That one’s 100%.”

Four managers indicated that productivity was most impacted. Veronica Jones, in reference to how productivity was impacted by having employees with the ACRC, commented, “Productivity continues to stay where we want it, so I feel like you can at least correlate those two things.”

Three managers indicated that retention was most impacted by the ACRC. Viola Treece summed up her feelings regarding the retention issue by saying, “I think it’s going to be the retention, and here’s why. I think someone who gets in a position that is performing at a good rate and able to develop and progress their career has a longer retention rate.” Only one of the managers, Nancy Dirks, had no opinion about which is impacted most.

Decision Making

The Phase I survey included one question related to participants’ opinions about how their company should use the Arkansas Career Readiness Certificate in the future. Table 30 presents Phase I results related to what the participants would recommend to their employers.

Twenty-two percent of participants indicated that they would recommend an increase in the use of the ACRC as a screening tool. Nine percent indicated that they would recommend a decrease in the use of the ACRC. Fifty-two percent of participants indicated that they would recommend continuing their current level of use, and 17 percent were unsure if use of the ACRC should be changed.

Table 30

Question 28: Based on your experience with employees who possess a Career Readiness Certificate, would you recommend that your company:

<u>Answer</u>	<u>%</u>	<u>Count</u>
Increase use of the certificate as a screening tool.	21.74	5
Decrease use of the certificate as a screening tool.	8.70	2
Maintain current level of use of the certificate as a screening tool.	52.17	12
Unsure.	17.39	4

N = 23, M = 2.35, SD = 1.03

During Phase II interviews, additional perceptions related to participants' recommendations for future use of the ACRC at their companies were gathered. Managers were unanimous in their opinion of continuing to use the ACRC in the future. While the Phase I

responses related to future use of the ACRC indicated a majority positive response, the Phase II comments were more certain and impassioned than the first phase results might have predicted.

Comments were consistent from most participants with phrases such as, “Absolutely use it.” Lance Cox declared, “Yes, absolutely, without hesitation, absolutely.” Viola Treece said, “The recommendation would definitely be to use that.”

Referring to the possibility of eliminating the ACRC, Lance Cox maintained, “We would be dumb...It would be taking a step backward.” Mary Newman claimed, “I would definitely recommend we don’t do any sort of testing outside of this.” Viola Treece referenced the value-added nature of the ACRC from hiring to promotion to the company’s bottom line. Veronica Jones referenced the good alignment of the ACRC when she stated, “The components of the CRC are much more applicable to industry.”

Additional Results from Phase II Qualitative Interviews

During Phase II interviews, additional perceptions related to overall performance along with wide-ranging opinions about the recognized attributes of ACRC holders were gathered from human resource managers. Areas of discussion regarding performance included qualification of candidates, motivation level, and inherent skills levels of certificate holders.

Qualified Candidates

Three managers referenced certificate holders as better candidates. Elizabeth Young commented, “You attracted a better applicant, and you knew that they had the skills entering the workforce.” Being “better” was mentioned in reference to ACRC employees’ ability to present themselves in the interview process and to have an overall better attitude compared to non-ACRC employees. Lyle Shiller asserted, “I can’t say I’ve ever had anyone in here with that certificate that hasn’t done at least well in an interview.”

Three participants mentioned the value of the ACRC because it indicates an employee's literacy level. Mary Newman said, "If we didn't have something like that [CRC]...people may come to work who can't read." Three managers spoke to the consistency of attracting qualified candidates with at least the minimum entry-level skills necessary for the advertised position. Lance Cox commented, "This is one of those things that will really help build a candidate pool that can start weeding out candidates from a candidate pool that don't belong in it." Mr. Cox also remarked, "Never had a case where we sat there and questioned whether or not the CRC process was worth...what we were trying to get out of it."

Renee Fulks spoke of the ACRC as proof that candidates were able to cross a higher hurdle as part of the onboarding process and that once hired, they have higher potential. She expressed, "If you can't take that test (ACRC), you can't take our tests, and you're not going to make it...you're going to be fired." Ms. Fulks also mentioned the ACRC as part proving the tenacity of applicants, "It's kind of a maze to put an application in here. The CRC is like the very last step that's the hardest for them to accomplish."

Motivated Employees

A consistent theme from all Phase II participants was that employees with the Arkansas Career Readiness Certificate (ACRC) are generally more motivated than non-ACRC employees. Wanda Jackson indicated that certificate holders were invested in themselves. She said, "When they've gone and done the Career Readiness they're actually...it's a way of investing in yourself." Ms. Jackson also remarked, "When you go and get the Career Readiness Certificate, then you are telling an employer that you really want this job."

Five managers spoke about ACRC holders' motivation to get a job and how that motivation typically carries over into job performance. Lyle Shiller claimed, "They went that extra step and they wanted it more."

Veronica Jones said that employees with the ACRC tend to be, "a little bit more technically advanced." Viola Treece mentioned how the certificate holders are trained more easily. Ms. Treece also referenced overall performance of certificate holders when she declared, "Yes, it does also impact things. When it comes to their work ethic, their attendance, their safety."

Two managers spoke of how employees exhibit a high level of pride relevant to earning the certificate. Lyle Shiller said, "What's great about it is whenever someone comes in here and has that certificate, they usually have it right there with their resume." Elizabeth Young offered that certificate holders exhibit a "sense of pride and accomplishment...a sense of accomplishment."

Upper Management and Department of Workforce Services Engagement

During Phase II interviews, questions related to the human resource managers' experience with administrative and management aspects of the Arkansas Career Readiness Certificate (ACRC) process were asked. These topic areas were not included in the Phase I survey. Themes emerged regarding use of the certificate, including the engagement of the human resources department, the upper management team, and the Arkansas Department of Workforce Services.

Comments from participants regarding how they and their colleagues in the human resources department at their respective companies discuss and manage the ACRC process were consistent among participants. Perceptions were that the ACRC process was seen as positive but

not something that was discussed much outside the procedural aspects of hiring those with certificates. Veronica Jones said the ACRC “is not a regular topic of discussion.” Lance Cox commented, “I can’t say a time, any point in time, where we’ve been displeased with the process or its capabilities of identifying a candidate’s skills and abilities.”

Opinions about the engagement level of upper-level managers with the ACRC process were also consistent among participants. Most indicated that following the selection of the ACRC as a screening tool, the topic was rarely, if ever, discussed among the management team. Mary Newman offered, “They know it’s a requirement, and they’re familiar with it, so it doesn’t get brought up a whole lot these days.” Veronica Jones stated, “Not a topic of conversation since we chose to adopt it.” For those who did experience occasional conversations with managers about the process, the feedback from managers was generally positive. Wanda Jackson said, “They think that it’s a good thing that’s something that they want a lot of the applicants to have.”

As for the participants’ relationship with the Arkansas Department of Workforce Services (ADWS), there was a mixed response based on individual managers’ experience with their local ADWS office. Four managers indicated a very good working relationship with good support and value-added services. Veronica Jones reported, “DWS in our area has been super easy to work with.” Others indicated that the service they receive today is not as good as it had been in the past. Renee Fulks declared, “I wasn’t pleased with the first results we got.” Mary Newman said, “Ultimately, we get what we need from them...sometimes it’s just not as quickly as we would like.”

Chapter 4 Summary and Findings

Chapter 4 provided results from the quantitative and qualitative phases of this mixed methods study. Quantitative results were presented in narrative and table formats. Qualitative

results were presented in summary form with quotations from interview transcripts. Information about the study participants was provided along with general information about the employers they represent.

The primary question to be answered by this study was: Do human resource managers at manufacturing firms in Arkansas believe that using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool leads to hiring higher-performing employees? The study was guided by three hypotheses as follows:

Hypothesis 1: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in safety performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 2: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in productivity performance of employees who earn the certificate as opposed to those who do not.

Hypothesis 3: H₀: Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in retention of employees who earn the certificate as opposed to those who do not.

Analysis of results from both phases failed to reject each of the null hypotheses. Results did, however, indicate that employees who possess an ACRC are perceived as performing at an overall higher level than those who do not have the certificate.

As indicated in the qualitative results, participants had mixed opinions about the effectiveness of the Arkansas Career Readiness Certificate, but all had an awareness and understanding of the certificate. In all forms of interaction with participants, there was common language, phrasing, and references to the certificate and the process of certificate use as a pre-hire screening tool.

Phase II participants expressed more consistent and positive opinions about the certificate regarding productivity than safety or retention. Comments within each category aligned with and supported the results of the Phase I survey.

The Phase II interviews also elicited opinions regarding engagement of human resource teams and upper management teams. For each of the groups, certificate management and understanding was limited to those who regularly manage the certificate program. For those not directly engaged, opinions were positive.

The participants' relationship with the Arkansas Department of Workforce Services was also explored. Opinions were mixed regarding the department and their efficiency and effectiveness in managing the certificate program for the state.

Participants indicated that overall performance of employees with the certificate was improved as compared to those without it. Positive reference was made to the certificate holders' motivation, entry-level skills, overall qualifications, and readiness to work.

Comments regarding continued / future use of the certificate as a pre-hire tool drew the strongest positive opinions. The Phase II participants were unanimous in their opinion that their respective company should continue using the certificate.

CHAPTER 5: DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

Chapter Overview

This chapter provides discussion of the research question and corresponding hypotheses in relation to this study's findings. The meaning of the findings is examined in the context of relevant literature and the theoretical framework and their contribution to the knowledge base. Implications for future policy and practice are explored, and recommendations for future research are presented.

Prior to this study, academic research related to human resource managers' perception of the effectiveness of the Arkansas Career Readiness Certificate (ACRC) in predicting employee performance had not been conducted. This was the first study to focus on one certificate level and the first dissertation regarding the ACRC.

The purpose of this mixed methods study was to gather the perceptions of human resource managers at manufacturing firms in Arkansas regarding the effectiveness of using the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool using an explanatory sequential design with two phases (quantitative followed by qualitative). Research was conducted to attempt to determine if use of the silver-level Arkansas Career Readiness Certificate (ACRC) as part of a pre-hiring system is effective in improving retention, safety, and productivity of employees hired through that system.

The problem addressed by this study was employers spending company resources on a pre-hire evaluation system without knowing if that expenditure made a difference relative to the safety, productivity, and retention of the employees hired within that system. The research question answered by this study was: Do human resource managers at manufacturing firms in

Arkansas believe that using the silver-level ACRC as a pre-hire screening tool leads to hiring higher-performing employees?

The theoretical framework for this study was built on decision theory, and that theory was used to facilitate the blending and comparison of results from quantitative and qualitative data analyses. Normative decision theory, also known as expected utility theory, provided a base set of decision-making assumptions and the opportunity to incorporate observation and evaluation into the theoretical interpretation of the decision-making process (Plous, 1993).

For the quantitative phase of the study, data were collected using an electronic survey that was distributed and collected in September and October of 2016. The survey results were used to test hypotheses related to employee performance when the silver-level ACRC is incorporated in pre-hire protocols at manufacturing firms in Arkansas. Analyses of survey data were conducted with special consideration related to company size, company location, and participant role in their respective company.

For the qualitative phase, data were collected by interviewing a subset of the participants from Phase I. Qualitative interviews were conducted in December of 2016 to further explore the primary research questions and to allow participants to share opinions of the Arkansas Career Readiness Certificate not captured through the Phase I survey process.

Through this study, it was found that the participating human resource managers indicated a positive overall perception of using the silver-level Arkansas Career Readiness (ACRC) as a pre-hire screening tool leading to higher-performing employees. Participants indicated a higher level of certainty about the positive effect of certificate use in relation to productivity factors than for safety or retention factors. It was also found that the managers indicated a strong preference for continuing to use the ACRC at their respective companies.

For this study, limitations were identified in three areas related to method, the researcher, and geography. The method was limited by the small number of manufacturing firms in Arkansas which use the ACRC, the general nature of the data collection methods, and the shortage of previous studies related to this topic. As a result of having worked with the ACRC system, the researcher's personal opinions and biases had the potential to influence interpretation of data and limit the study. Because this study was designed to examine the effectiveness of using the silver-level ACRC as a pre-hire screening tool at manufacturing firms in Arkansas, the study was limited geographically by the boundaries of the State of Arkansas.

Discussion and Conclusions

Research Question

The primary question to be answered by this study was this: *Do human resource managers at manufacturing firms in Arkansas believe that using the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool leads to hiring higher-performing employees?*

Participants believed that using the silver-level Arkansas Career Readiness Certificate leads to hiring employees who perform at a higher level. Participants indicated that overall performance of employees with the certificate was improved as compared to those without it. Positive reference was made to the certificate holders' motivation, entry-level skills, overall qualifications, and readiness to work.

As organizational structures have adjusted to global economic and competitive realities in the late twentieth and early twenty-first centuries, the critical need for strategic hiring and placement has become increasingly important for all types of firms. Newly hired employees must be able to acquire skills quickly and exhibit critical thinking ability as means to be

productive at a high level (Stanley, 2004). This study has shown that human resource managers at manufacturing firms in Arkansas feel that that by using the ACRC, they have the necessary strategy and screening tool in place to satisfy that critical need and hire employees with requisite skills and abilities.

According to the Arkansas Department of Workforce Services (2015b), obtaining an ACRC will allow a prospective employee to show employers that s/he has the basic skills the employer is looking for. The findings from both phases of this study confirm that claim in relation to manufacturing firms. Participants' sentiments about certificate holders being "better" employees can be summed up through one particular comment from Elizabeth Young's Phase II interview, "You attracted a better applicant, and you knew that they had the skills entering the workforce."

Deitz and Orr (2006) noted that manufacturing-based high-skill jobs have increased by 37 percent since the early 1980s and that "technology and increased globalization have, on the one hand, reduced the number of low-skill jobs and, on the other, provided opportunities for high-skill manufacturing employment to expand. As a result, a manufacturing workforce is emerging that is at once leaner and more skilled" (p. 7). From this study, the knowledge base was expanded as it was learned that human resource managers do see the ACRC as a means for attracting those prospective employees with higher skill sets.

Having the ACRC as evidence of basic skills along with knowledge of job opportunities requiring the ACRC may increase hiring rates for those credential earners (Buddin, LeFebvre, & Walker, 2013). This study supports the concept of increased hiring for those with the ACRC. Participants, through Phase II interviews, indicated a positive bias toward applicants with an ACRC due to the perceived likelihood of higher overall performance by certificate holders.

A major component of attracting and retaining high-growth jobs is to “provide individuals with the capabilities and verification of capabilities” (DuBois & Westerman, 2007, p. 535) necessary for those jobs. While this research did not explore the economic development aspect of attracting jobs to the state, it does support the concept of the importance of verifying prospective employees’ capabilities. Participants in many cases indicated that the ACRC is the only screening tool necessary (beyond traditional applications and interviews) to establish a candidate’s potential for performing at a high level. Mary Newman said, “It is the only screening tool we use outside of an interview.”

Cascio and Aguinis (2008) suggested that pre-employment assessment systems are often limited in efficacy due to too narrow a focus on behavioral consistency (or lack thereof) that may not be predictive of job performance, inattention to employee attributes that may lead to adverse outcomes, unrealistic expectations of financial gain as a result of using a particular assessment system, and the lack of global applicability of the assessment across an organization. The findings of this study seem to contradict Cascio and Aquinis (at least as related to job performance and organization-wide applicability) in that a majority of participants expressed a positive overall perception of the results of using the ACRC. In fact, participants in Phase II were unanimous in their opinions that their respective companies should continue to use the ACRC as a pre-hire screening tool.

Three levels of essential workplace skills have been identified by Grey and Herr (1998). Work ethics and behavior, academic skills, and occupational and advanced workplace literacy skills comprise the interconnected set of necessary attributes for workforce education to provide effective and comprehensive worker skills upgrades. This study provided interesting new information to the knowledge base where essential work ethic, behavior, and occupational skills

are concerned. Participants frequently referenced how certificate holders were more likely to have good work ethic, attendance, attitude, basic skills (traditional academic, soft skills, and technical skills), literacy, and trainability.

Likewise, this study added to the knowledge base by revealing that employers are more likely to hire an ACRC holder as compared to a non-certificate holder when all other considerations are equal. This is an important indicator of the value human resource managers place on the certificate in terms of anticipated overall performance. In Greene's (2008) research, employers indicated that the majority of new hires did not have requisite skills for today's jobs with four out of five businesses noting less than adequate numbers of fully proficient employees. The skills gap in Arkansas is greatest in the manufacturing sector with middle-skill jobs accounting for the most prevalent deficiency rates in the state (DeRenzis & Chang, 2014). In this study, confidence in the ACRC as a pre-determinant for performance was revealed as a means to hiring more aptly skilled workers and (at least partially) diminishing the negative impacts of pervasive skills gaps.

This study was based on a theoretical framework of decision theory. Ultimately, the question is whether or not manufacturers should decide to use the ACRC as a pre-hire screening tool. From Phase II interviews, it was evident that companies did not base their decisions to begin using the ACRC through an application of normative decision theory. Those early-use decisions were guided by marketing and information from the Arkansas Department of Workforce Services and the Governor's office and based on the prospect of improved hiring and retention.

Based on the findings of the study, participants were consistent in their perceptions regarding recommendations for future use of the certificate. The concept of recommending

future use resulted in a very strong positive response with three-fourths of Phase I survey respondents indicating that, based on their experience with employees who possess the ACRC, they would recommend either maintaining or increasing use of the certificate as a screening tool.

As mentioned above, Phase II interviews revealed a unanimous opinion among participants that their respective companies should continue to use the certificate as a screening tool. It is important to note that the decision to continue using the ACRC as a screening tool was the only topic in which the Phase II participants were in 100 percent agreement. The participants' decision for future use of the ACRC as a pre-hire screening tool does represent an application of normative decision theory. The human resource managers used their experiences and evidence gathered related to the performance of certificate holders and applied a rational judgment based on that evidence. Through this normative process, the participants have arrived at the conclusion that continuing use of the certificate is what they ought to do. This study's recognition of the participants' use of normative decision theory adds to the understanding of the perceived benefits of use of the ACRC.

Finally, regarding the overall research question, it is important to compare the findings of this study to the broad claims made by ACT, Inc., (parent company of WorkKeys and the Career Readiness Certificate system) in relation to the certificate's ability to identify prospective employees who will perform at a higher level. According to ACT, Inc.'s, promotional materials, "ACT WorkKeys is a job skills assessment system that helps employers select, hire, train, develop, and retain a high-performance workforce" (ACT, Inc., 2015b, para. 1). This study confirms ACT, Inc.'s, assertions as they relate to retention and performance at manufacturing firms in Arkansas.

Hypothesis 1: Safety

The first hypothesis within the research question was related to employee safety: *Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in safety performance of employees who earn the certificate as opposed to those who do not.*

Through this research, it was found that more participants perceived the silver-level Arkansas Career Readiness Certificate (ACRC) to have a positive impact on safety performance than those participants who perceived it to not have a positive impact. The largest percentage of participants, however, were undecided in their perceptions of the impact of the certificate on safety performance. Phase II interviews confirmed the uncertainty among participants regarding the effectiveness of the certificate.

Responses regarding safety from both phases indicate that human resource managers do not feel that the ACRC is a strong indicator of safety performance, nor do they rely on it to make decisions about safety training needs of employees. Participants indicated that other factors such as a pervasive company culture focused on safety were much more important to overall safety performance than having employees with the ACRC. Some managers did, however, suggest that ACRC holders are likely to be more receptive to and capable of being trained, which can lead to quicker adoption of and adherence to safety standards.

Considering the participants' views that safety is not a primary positive benefit of using the ACRC, this research indicates that for the purposes of making decisions about future use of the ACRC, managers and their respective companies are unlikely to place much, if any, emphasis on safety implications as they weigh those future-use decisions.

Casillas, Robbins, McKinniss, Postlethwaite, and Oh (2009) indicated that job-related injuries and accidents are an ongoing worldwide problem with more than 350,000 fatal and 264 million non-fatal accidents worldwide annually. In this study, participants' responses indicated an uncertainty as to whether hiring ACRC holders led to a reduction in violations of safety protocol or a reduction in employee injuries. This suggests that the ACRC is not a stand-alone or even a major consideration for combatting occurrences of workplace accidents and injuries.

Greene (2008) indicated that use of the Career Readiness Certificate reduced general training time but did not reduce safety training time at the employers represented in that study. This study confirmed Greene's assessment in that participants' responses to questions about safety training indicate minimum effect on reducing training time. Responses from Phase II provided the additional explanation that safety training is a structured and required component of on-boarding and annual training regardless of other credentials or experience. This further confirms that the ACRC is not perceived as a predictor nor an assistive tool in regard to hiring higher-performing employees as related to safety.

Postlethwaite, Robbins, Rickerson, and McKinniss (2009) said, "When predicting employee safety behavior, it may be particularly beneficial to consider both cognitive ability and conscientiousness in tandem" (p. 712). This study seems to support this claim with results that indicate a substantial gap between participants who positively perceive the ACRC as a tool for hiring employees with a realization of the importance of safety versus those participants who do not perceive it positively in that regard. This further supports claims by participants that certificate holders are more likely to be cognizant of important issues (such as safety) even if the certificate does not have a direct connection to safety-related performance.

Results from Greene's (2008) research indicated that teamwork was an indirect benefit from having employees with a Career Readiness Certificate. In this study, participants were asked about the role of the ACRC in regard to employees working out safety issues with their respective work teams. Of all the safety-related questions in the Phase I survey, on this one question participants showed more certainty in their response, and seem to have confirmed Greene's assertion of a side benefit to teamwork as a result of the ACRC.

Literature related to safety implications of the Career Readiness Certificate is very limited. This study adds to the knowledge of the subject matter by providing some of the first (perhaps the only) results connecting the efficacy of WorkKeys and the Career Readiness Certificate to perceptions of human resource managers in the manufacturing sector as related to employee safety performance.

Hypothesis 2: Productivity

The second hypothesis within the research question was related to employee productivity: *Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in productivity performance of employees who earn the certificate as opposed to those who do not.*

Through this research, it was found that participants did perceive the silver-level Arkansas Career Readiness Certificate (ACRC) as a pre-hire screening tool that leads to hiring employees with higher levels of productivity. Participants in both phases of the study indicated much more certainty in their opinions about the positive effect of the ACRC on productivity than they did on either safety or retention.

Drucker's (1959) predictions related to how employees with adequate experience, expertise, and knowledge will be the determining factor in a firm's ability to remain competitive

have proven reliable today in that having the employees properly matched with specific skills and expertise is indeed essential for productivity and profitability (Hankin, 2005). Stanley (2004) confirmed that significant overall productivity gains can be realized by those organizations that systematically hire and place highly skilled workers and leverage the synergy created by workgroups made up of such employees. Phase I results from this study support the literature in that participants indicated ACRC holders have a better appreciation for the importance of being productive, require fewer reworks in the production process, and productivity goals are met more consistently. Likewise, Phase II interviews further support these claims as participants indicated that ACRC employees were more productive as a result of being better-prepared, more motivated, and more efficient.

Organizations which strive to create an environment built on employees' ability to think critically, independently, and with an eye toward how individual effectiveness impacts overall team performance often depend on traditional education records such as high school diplomas, General Education Development (GED) tests, or college entrance exam scores as indicators of a prospective employee's potential (Bowles, 2004). For applicants who do not have any of those traditional attainment markers, the Career Readiness Certificate often serves as an indicator of the job seeker's basic skills and ability to fit into the learning organization culture (Bowles, 2004). "The CRC provides a workplace skills certification that businesses can connect directly to productivity, quality, business processes, and profitability" (DuBois & Westerman, 2007, p. 536). This study supports the claims above and adds to the knowledge base related to employee productivity through the study's participants' assertions that ACRC holders are more likely to be able to think critically, to be more aware, and have better decision-making skills.

Attempting to predict future performance is an ongoing and challenging process for human resource development professionals. Current techniques for identifying qualified and productive staff are often seen as less than successful when contrasted against performance metrics. Cascio and Aguinis (2008) suggested that pre-employment assessment systems are often limited in efficacy due to too narrow a focus on behavioral consistency (or lack thereof) that may not be predictive of job performance, inattention to employee attributes that may lead to adverse outcomes, unrealistic expectations of financial gain as a result of using a particular assessment system, and the lack of global applicability of the assessment across an organization. The results of this study differ from Cascio and Aguinis' claims as evidenced by the participating human resource practitioners' reliance on the ACRC as a valid predictor for future productivity.

Greene (2008) surveyed managers at companies in North Carolina that use WorkKeys as a pre-hire screening tool to determine if use of the assessment had any effect on turnover, scrap material, training time, overtime, and teamwork. Greene compared the perception of WorkKeys effectiveness by managers based on company size. "Over half (60 percent) of the managers agreed training time was reduced, 52 percent agreed turnover was reduced; 40 percent agreed teamwork was increased, 36 percent agreed scrap material was reduced, and 17 percent agreed overtime was reduced with the use of WorkKeys" (p. ix). No difference was indicated based on company size.

In comparison to Green (2008), this study contributed to expanding the knowledge base through similar inquiry of the impact of certificate holders on productivity. In this study, it was found that 52 percent of Phase I participants perceived that production training time was reduced as compared to 60 percent in Greene's study. Also, in this study, it was found that 45 percent of Phase I participants perceived that teamwork related to production was improved as compared to

40 percent in Greene's study. Likewise, it was found that nine percent of Phase I participants perceived that overtime was reduced as compared to 17 percent in Greene. The similar nature of the two studies and their accompanying similar results (in a field with very little other related research) suggest of consistency between two separate samples of employers from different areas of the country, thereby indicating that results from one study or the other may not be singular or unique phenomenon.

Hypothesis 3: Retention

The third hypothesis within the research question was related to employee retention:

Human resource managers at manufacturing firms in Arkansas that use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool report no improvement in retention of employees who earn the certificate as opposed to those who do not.

Through this research, it was found that more than 40 percent of participants perceived the silver-level Arkansas Career Readiness Certificate (ACRC) as having a positive impact on retention. Participants indicated more certainty in their opinions on retention than they did on safety-related issues, but perceptions on retention-related issues were not as positive as those related to productivity.

The direct costs associated with making poor hiring decisions can have serious negative influence on profitability for employers where costs associated with turnover can reach as much as 200 percent of a bad hire's annual salary (Grigoryev, 2006). This study showed that participants perceived positive results in terms of retention when hiring employees who possess the ACRC, but participants did not mention any direct financial correlation between reduced turnover and company profitability.

Connell and Phillips (2003) explored several issues pertaining to managing retention as an imperative strategic initiative. They contended that effective screening and hiring mitigates the negative impact of turnover in an organization, which can undermine critical strategic goals and often includes major consequences such as work disruption, lost productivity, and quality problems. This study's findings relative to reduced turnover and employees who understand the importance of high retention rates indicate that participants do see the ACRC as important in their overall hiring and retention strategies.

The findings further add to the knowledge base by showing that although human resource managers may not see retention as the leading benefit of using the ACRC as a pre-hire screening tool, they do value it as a mechanism for identifying candidates who are ultimately better qualified. Therefore, while the ACRC may not be a direct determinant for improved retention, certificate holders have a higher likelihood of being successful in critical job functions, which may lead to improved retention. The impact on retention is also a factor in the overall assessment of the ACRC and the decision process for continued use.

Hendrick (2006) studied the correlation of WorkKeys assessment scores and employee retention rates at twelve employers in six states with the primary focus in Virginia. Fifty percent of participants in that study felt that employee retention was improved by using the Career Readiness Certificate. Greene (2008) surveyed managers at companies in North Carolina which use WorkKeys as a pre-hire screening tool to determine if use of the assessment had any effect on turnover, scrap material, training time, overtime, and teamwork. In Greene's study, 52 percent of participants agreed that turnover was reduced through use of the Career Readiness Certificate. In comparison, this study had 39 percent of Phase I participants indicate that they perceived the ACRC to reduce employee turnover. With a lower percentage, these findings

differ somewhat from the Greene and Hendrick studies but do contribute to further understanding that practitioners' opinions about the certificate and its impact on retention seem mixed, at best.

Recommendations

Based on the data, findings, results, and conclusions in this study, recommendations are made relative to state-level policies and procedures for administration of the Arkansas Career Readiness Certificate program. Recommendations are also made relative to use of the certificate by human resource practitioners in Arkansas and for additional research on this and related subjects. These recommendations apply to all three hypotheses (safety, productivity, and retention), the study results as a whole, and the theoretical framework.

Policy

The findings of this study indicate the need for review of how state agencies affiliated with the Arkansas Career Readiness Certificate (ACRC) manage, market, and consider expansion of the program.

Following the inauguration of a new governor in 2015 and subsequent changes in appointed executives at related state agencies, the emphasis on the ACRC program has waned. Findings from this study indicated that human resource managers have had a mixed experience with agencies, particularly the Arkansas Department of Workforce Services (ADWS), the managing agency for the program.

State policy makers at ADWS, the Arkansas Economic Development Commission, the Arkansas Department of Education, the Arkansas Department of Career Education, and the Arkansas Department of Higher Education should review and analyze the current level of individual and inter-agency support for the ACRC program to determine their connection to and

support (or lack thereof) for the ACRC. Each of the agencies listed has an interest in credentialing programs and the positive net effect on employment, performance, and the economy of the state. Given the results of this study, the partnering agencies should revisit the importance of the program and encourage adoption of the certificate as a screening tool by additional employers.

In their perceptions of ADWS performance as related to the ACRC program, study participants indicated varying levels of consistency from ADWS staff in terms of program support and knowledge. Because the results of this study indicate a positive effect on overall performance for those employees with an ACRC, ADWS should provide ongoing training to make certain that employees in field offices understand the certificate's value and how to properly engage and support employers that currently use the certificate as a screening tool or those employers expressing interest in adopting the certificate as a screening tool.

Participants in this study indicated reduced engagement from the state-wide network of ACRC steering committees and peer employers that use the certificate. When active, the regional steering committees provided a venue for agencies and employers to share best practices, challenges, successes, and resources related to the ACRC. This interactivity allowed for a broader understanding of the certificate and permitted employer peer groups to learn from one another. Because the results of this study show positive results from certificate use, ADWS should take the lead to re-engage the various steering committees around the state in an effort to reconnect peer employers and the agency and encourage expanded use of the certificate as a screening tool.

In addition to the regional steering committees, ADWS should develop a direct marketing initiative aimed at upper management and executives to encourage use of the ACRC. Results

from this study showed a widespread lack of interest, participation, or understanding of the certificate benefits by upper-level managers at companies currently using the ACRC as a screening tool. By providing evidence of the certificate's positive impact on performance to local and corporate-level decision makers, use of the ACRC may expand.

Results from this study showed that human resource managers are often left to explore and attempt to understand the ACRC program on their own. In order to assist practitioners to become better informed and able to make better decisions about if or how to deploy use of the certificate as a screening tool, it is recommended that ADWS initiate ACRC-related training for human resource managers to better understand how to best use the certificate and how it can impact safety, productivity, and retention. ADWS, through local agency offices, should monitor changes in human resources personnel at local employers and provide opportunities for training new hires in human resources departments. This purposeful and targeted outreach by ADWS could eliminate much of the self-guided exploration currently required by those who want to know more about the ACRC program.

Practice

The findings of this study indicate the need for employers in Arkansas and the human resource practitioners who manage the Arkansas Career Readiness Certificate (ACRC) program at their respective companies to expand use of the certificate and to measure the certificate's efficacy in a way that allows for program-specific data collection and analysis.

Based on this study's results, which show a positive impact on employee performance through the use of the ACRC, it is recommended that use of the certificate as a pre-hire screening tool be increased throughout the state by having human resource managers seek out information regarding the program's efficacy from the Arkansas Department of Workforce Services and

deploy tactics to expand certificate use as appropriate for each company. This approach is further evidenced by the strong opinions among participants that their companies should continue or expand use of the certificate in the future. The increase is recommended in terms of expanded use at existing ACRC companies as well as adoption by companies not currently using the ACRC as a screening tool.

Because the results of this study showed that most companies do not actively track data associated with employee performance as related to ACRC, it is recommended that employers adopt performance measurement and reporting standards for productivity and retention to permit longitudinal tracking and analysis. With internal tracking, employers will have data to inform decisions about best use of the certificate and any return on investment implications which result from using the ACRC. This study was based on perceptions of human resource professionals, but with strategically measured and tracked performance, employers will be better prepared to make decisions about future use of the certificate as a screening tool.

The results of the study indicated an uncertainty as to the ACRC's ability to determine the likelihood of improved safety performance of certificate holders vs. non-certificate holders. It is recommended that employers deploy safety-specific tracking metrics including accident and injury analyses as related to the ACRC in order to eliminate the uncertainty, thereby providing additional actionable information in determining best-use scenarios in the future.

Study participants' perceptions indicated that ACRC employees have improved performance as related to productivity. It is recommended that employers quantify those productivity gains in terms of profitability through individual and team task analysis and performance results in order to ascribe a financial equivalency to use of the certificate. Through greater understanding of the

return on investment by using the ACRC as a screening tool, companies will be able to make better decisions about hiring and production goals.

Participants' opinions regarding the effect of the ACRC on employee retention were mixed. It is recommended that for those companies that have ACRC and non-ACRC employees, tracking methods be deployed to quantify retention rates (longevity and promotion rates) and determine what, if any, effect the certificate has on those rates.

Because this study focused on employee performance as related to safety, productivity, and retention, it is recommended that within employers' performance tracking systems, participating companies develop comparative and correlative reports to determine if any of the performance areas is predictive or impactful on the others. By having a better understanding of how (or if) the three areas are connected, employers will be able to place emphasis on those areas that make the most positive impact on all performance goals.

Phase II participants perceived that ACRC employees were likely to have higher levels of inherent skills when hired as compared to non ACRC employees. It is recommended that employers use the ACRC for all new-hires in order to be able to compare skill levels across all employees at the time of hire. Based in normative decision theory, this approach will allow for improved decision making about the effect and benefit of continued or increased use of the certificate.

Phase II participants also indicated the perception that ACRC employees were more likely to make a positive impact on production quality issues. It is recommended that employers track and compare quality control outcomes based on certificate vs. non-certificate employee performance in order to quantify what (if any) difference employers experience as related to quality by hiring ACRC holders.

Martin (2009) identified the common reasons employers are likely to eliminate applicants for entry-level manufacturing positions amid a constant struggle to identify and retain those employees. Basic technical skills and knowledge, basic communication skills, and basic workplace readiness skills (attendance, timeliness, work ethic, etc.) were ranked consistently by employers as the minimum requirements for developing a productive and reliable employee base. Phase II results from this study indicated that participants perceived ACRC employees to be generally better qualified and more motivated. It is recommended that employers deploy some form of assessment, such as the Atman's psychometric test, for new hires in order to be able to compare general qualifications and motivation across all employees at the time of hire. Similar to skills testing, this will allow for improved decision making about the effect and benefit of continued or increased use of the certificate. Similar to the recommendation for deciding about future use of the certificate, normative decision theory is appropriately applied to this recommendation concerning hiring ACRC holders because they are better qualified and more motivated. If certificate holders are better qualified, then normative decision theory dictates that employers ought to hire them as compared to non-certificate holders.

Research

This study was narrowly focused on one level of the Arkansas Career Readiness Certificate (ACRC). Due to that narrow focus and the stated research limitations, numerous future research opportunities are recommended for achieving a more thorough understanding of the efficacy of the Career Readiness Certificate system:

Pre-employment assessments that are rooted in the specific job opening, particularly if adequate job analysis or profiling has been completed, may lead to better success in hiring followed by higher rates of retention (Hendrick, 2006). Efforts by Arkansas manufacturers to

profile certain jobs and align those jobs with particular levels of the Arkansas Career Readiness Certificate have been based on marketing and promotion from the Arkansas Department of Workforce Services with claims of reduced turnover, improved morale, and effective use of training dollars (Arkansas Department of Workforce Services, 2015b). The current study did not examine the effect of having individual jobs profiled based on perceptions of human resource managers. Further research should include comparisons of employers which invest in job profiling vs. those which do not.

In 2010 and 2011, as the effects of the Great Recession culminated in record levels of unemployment, the National Association of Manufacturers reported that a third of American manufacturing firms were still struggling to fill open positions (Manufacturing Institute, 2011). Skills required for employment were simply not prevalent among prospective employees applying for those positions (Sullivan, 2012). This study was conducted at a time when the state and national unemployment rates were at record lows following several years of steady declines. Further longitudinal research should be conducted at points in time with varying unemployment rates to determine if perceptions of human resource managers regarding certificate holders differ based on current unemployment rates. The influence of supply and demand of qualified labor might have an influence on the importance (or lack thereof) employers place on credentials such as the ACRC.

This study focused on the silver-level Arkansas Career Readiness Certificate at manufacturing firms in Arkansas. In Arkansas, individuals who successfully complete the WorkKeys assessments are awarded a bronze, silver, or gold level ACRC depending on their assessment scores. The silver-level certificate was chosen over the other levels because it represents 59 percent of the total certificates awarded in Arkansas since the program began.

Further research should include all levels of the certificate to determine efficacy of the entire Career Readiness Certificate system. Further research should also include non-manufacturing firms and firms located in other states.

This study accepted participants to Phase II interviews based on their indication of being willing to be interviewed. Further research should include a qualitative-only study to more deeply explore perceptions and motivations of human resource professionals engaged in managing the ACRC program for their respective companies.

The current study did not review any company-specific data regarding the financial or profitability implications of using the Arkansas Career Readiness Certificate as a pre-hire screening tool. Further research should analyze employer data to calculate return on investment and determine what, if any, financial benefits exist as a result of certificate use as related to safety, productivity, and retention.

From a community and economic development perspective, when large numbers of people in a city or region earn a recognized workplace readiness credential, the overall work-ready identity of the community is elevated, thereby making existing business retention and new business recruiting more likely (DuBois & Westerman, 2007). This study did not ask for company-specific data related to safety, productivity, or retention rates. Further research should include longitudinal comparisons of performance using data from employers to compare safety, productivity, and retention of certificate holders vs. non-certificate holders and issues pertaining to continuous quality improvement, production quality, and customer satisfaction. By having that information available, community and economic development efforts can be established and managed using timely and pertinent local data.

In addition to basic reading, writing, and mathematics, employers continue to rank workplace readiness skills ahead of technical skills in the level of importance for new employees. The most important non-academic workplace skills identified by employers include professionalism, communication, collaboration, and problem-solving skills (Shultz, 2011). This study was not designed to explore soft skills of employees with the Arkansas Career Readiness Certificate. Additional research is needed to determine if the certificate is an indicator of improved soft skills.

In recent years, certification and credentialing systems have become more prevalent for use in assisting prospective employees prepare for employment opportunities and for employers to use as pre-screening tools. As more employers have given preferential consideration to those prospects with work-ready credentials (thereby reducing the amount of time required and costs associated with on-the-job training), job seekers have been motivated to acquire additional credentials prior to applying (Carter, 2005).

In Arkansas, funding for colleges and universities is moving to a performance-based model which will include allocations determined, in part, by the number of credentials, certificates, and degrees awarded (Arkansas Department of Higher Education, 2016). In the current plan, the Arkansas Career Readiness Certificate is not considered as a credential for funding purposes. Many Arkansas colleges, particularly two-year colleges, spend institutional resources to manage the Career Ready 101, WorkKeys, and Arkansas Career Readiness Certificate system.

Further research is needed to quantify the return on investment of the certificate for Arkansas businesses in order for colleges to have evidence as to why the certificate should be counted as a credential within the performance funding model. With that further research, the State of Arkansas, through the Arkansas Department of Higher Education, should apply normative

decision theory to the process in order to determine what ought to be done relative to the certificate's applicability for funding considerations.

Summary

Despite having been in place in the state for nearly a decade with over 65,000 Arkansans earning an Arkansas Career Readiness Certificate (ACRC), prior to this study no research had been conducted to determine the effectiveness of the ACRC as a pre-hire screening tool. The research question of this study focused on the silver-level ACRC and the perception of human resource managers at manufacturing firms in Arkansas regarding the certificate's influence on hiring higher-performing employees. The study sought out the managers' perceptions related to employee safety, productivity, and retention.

This study included results from quantitative and qualitative research with similar participant perceptions found in both phases. The Phase II qualitative results confirmed and further illuminated the Phase I quantitative findings. Through the merging of results from the two phases, it was concluded that human resource managers at manufacturing firms in Arkansas believe that use of the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool does lead to hiring higher-performing employees. This study further concluded that human resource managers perceive employee productivity to be positively impacted more than safety or retention, and that overall performance of employees with the certificate was improved as compared to those without it.

Chapter 5 provided a review of the research question and corresponding hypotheses in relation to the study's findings. Findings were reviewed in the context of relevant literature and the study's theoretical framework, and how those findings contributed to the knowledge base.

Based on the data, findings, and conclusions of this study, Chapter 5 included recommendations relative to state-level policies and procedures for administration of the Arkansas Career Readiness Certificate program. Recommendations were also made relative to the use of the certificate by human resource practitioners in Arkansas and for additional research on this and related subjects. Finally, Chapter 5 included a brief summary of the study structure and results.

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APPENDIX A: ARKANSAS CAREER READINESS CERTIFICATE EMPLOYER LIST

Employers Using CRC as part of the Hiring Process

NOTICE – JOB SEEKERS: if you would like more information about the employers who are using the CRC as part of their pre-employment process and are listed on the CRC website, please contact your nearest Workforce Center. A list of the Workforce Centers is also listed on the [CRC website](#).

Employer	City	County
3 Rivers Flooring	Helena – West Helena	Phillips
3M Company	Little Rock	Pulaski
Actronix, Inc.	Flippin	Marion
Aerojet	Camden	Ouachita
Alberto Culver	Jonesboro	Craighead
Allen Appliance	Harrison	Boone
AMC, Inc.	Camden	Ouachita
American Railcar, Inc.	Paragould	Greene
American Spirit Enterprises, Inc.	Marshall	Searcy
Anchor Packaging	Paragould	Greene
Arquest, Inc.	Camden	Ouachita
Ashland Chemical, Inc.	Jacksonville	Pulaski
Austin Powder Co.	Camden	Ouachita
Auto Rec Inc.	Harrison	Boone
Baxter Healthcare Corporation	Mountain Home	Baxter
Branson Getaways	Harrison	Boone
Cardinal Health	Sherwood	Pulaski
Century Industries, Inc.	Little Rock	Pulaski
CertainTeed Gypsum	Nashville	Howard
City of Hot Springs	Hot Springs	Garland
City of West Memphis	West Memphis	Crittenden
Claridge Products & Equipment, Inc.	Harrison	Boone
Defiance Metal Products	Heber Springs	Cleburne
Domtar Industries, Inc.	Ashdown	Little River
Doubletree by Hilton Hotel	Little Rock	Pulaski
Eaton Hydraulics LLC	Searcy	White
EnviroTech Chemical Service	Helena – West Helena	Phillips
Esterline Defense Group	Camden	Ouachita
Evergreen Packaging	Pine Bluff	Jefferson
Family Dollar	West Memphis	Crittenden
Fidelity National Information Services (FIS)	Little Rock	Pulaski
Fishing Holdings, LLC	Flippin	Marion
Funder America Inc.	Hope	Hempstead
FutureFuel Chemical Company	Batesville	Independence
Garlock Rubber Technologies	Paragould	Greene
General Dynamics Armament and Technical Products	Hampton	Calhoun
Glad Manufacturing Company	Rogers	Benton
Government Sewing & Apparel L.L.C.	Hope	Hempstead
Graphic Flexible Packaging	Pine Bluff	Jefferson

Employer	City	County
Harps Food Stores, Inc.	Benton	Saline
Hino Manufacturing	West Memphis	Crittenden
Hoffinger Industries	Helena – West Helena	Phillips
Hope Water & Light	Hope	Hempstead
J Kelly Referrals and Information Services, Inc.	Little Rock	Pulaski
J. R. Simplot Company	West Memphis	Crittenden
JEVAC Machine Inc.	Magnolia	Columbia
Klipsch Audio Technologies	Hope	Hempstead
LM Glasfiber, Inc.	Little Rock	Pulaski
Lockheed Martin	Camden	Ouachita
LSI Temporary Services	Marion	Crittenden
L'OREAL USA	North Little Rock	Pulaski
MAHLE Engine Components	Russellville	Pope
McClain Forest Products, LLC	Western Grove	Newton
Mid-America Packaging	Pine Bluff	Jefferson
Mission Plastics of Arkansas	Nashville	Howard
Muzzleload Magnum Products, Inc.	Harrison	Boone
Nice-Pak Products, Inc.	Jonesboro	Craighead
North Arkansas College	Harrison	Boone
North Arkansas Furniture Mfg. Inc.	Batesville	Independence
Post Food LLC	Jonesboro	Craighead
PPG Industries	Alexander	Pulaski
Replacement Parts, Inc.; Bumper to Bumper	Little Rock	Pulaski
Rexan	Hot Springs	Garland
Rineco	Benton	Saline
Rockline Industries	Springdale	Washington
Rockline Industries, Inc.	Booneville	Logan
Sage V Foods, LLC	Little Rock	Pulaski
Spectra Technologies	Camden	Ouachita
Southern Hardware	Helena – West Helena	Phillips
Stant Manufacturing	White Hall	Jefferson
Stant USA Corporation	Pine Bluff	Jefferson
Strong Manufacturing Co. Inc.	White Hall	Jefferson
Superior Switching Services	White Hall	Jefferson
Sykes Enterprises	Malvern	Hot Spring
Thermo Fisher Scientific	Mountain Home	Baxter
Triumph Airborne Structures	Hot Springs	Garland
Triumph Fabrications – Hot Springs	Hot Springs	Garland
US Logistics, Inc.	Harrison	Boone
Wabash Wood Products	Harrison	Boone
Welspun Pipes	Little Rock	Pulaski

APPENDIX B: PHASE I IRB APPROVAL



Office of Research Compliance
Institutional Review Board

September 19, 2016

MEMORANDUM

TO: Bentley Wallace
Carsten Schmidtke

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #: 16-07-026

Protocol Title: *Silver-Level Career Readiness Certificate in Arkansas*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 09/18/2016 Expiration Date: 08/09/2017

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 100 total participants.** If you wish to make any further 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.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 109 MLKG Building.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

APPENDIX C: PHASE I CONSENT FORM AND ONLINE SURVEY INSTRUMENT

QUESTIONS

Consent Form for Quantitative Survey to be Included on Qualtrics

The following language will be included in the online data collection instrument as preamble to the survey and will serve as the method for obtaining consent from participants:

INVITATION TO PARTICIPATE

You are invited to participate in a research study about the silver-level Career Readiness Certificate in Arkansas. You are being asked to participate in this study because your company employs individuals who possess Career Readiness Certificates. To participate in this survey, you will need to read this informed consent statement and, if you agree to participate, click on the survey link at the bottom of this page to complete the online survey.

WHAT YOU SHOULD KNOW ABOUT THE RESEARCH STUDY

The principal researcher for this project is:

Bentley Wallace
c/o Pulaski Technical College
3303 E. Roosevelt Road
Little Rock, AR 72206
501-707-7870 cell
501-907-6670 office

The faculty advisor for this project is:

Carsten Schmidtke, PhD
Assistant Professor, College of Education and Health Professions
Rehabilitation, Human Resources and Communication Disorders
University of Arkansas
Fayetteville, AR 72701
Phone: 479-575-4047
cswded@uark.edu

The purpose of this project is:

The purpose of this study to gather perceptions of human resources managers at manufacturing firms in Arkansas relative to the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool.

Project participants:

Human resource managers at manufacturing firms in Arkansas which use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool.

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Your participation:

Your participation in this phase of the study will consist of completing the following survey which includes 21 questions regarding your experience with employees at your company who have an Arkansas Career Readiness Certificate. The survey is administered using Qualtrics survey software made available by the University of Arkansas.

Time required for survey:

The survey consists of 21 questions and should take fewer than 15 minutes to complete.

Possible risks or discomforts:

There are no known risks associated with this study.

Possible benefits:

There are no personal benefits to participants, but the findings may help clarify the usefulness of the silver-level Arkansas Career Readiness Certificate.

Compensation for participating:

You will not be compensated for completing the survey.

Cost of participating:

There is no cost associated with completing the study.

Option to not participate:

You are in no way required to participate in this study. Also, you may choose to stop participating at any point after starting the survey. There are no negative consequences for not participating.

Confidentiality:

All information will be kept confidential to the fullest extent of the law and University of Arkansas policy.

Prospective participant names, employers, and contact information will be known to the researcher only. No personally identifiable information will be included in the data analysis results. No person other than the researcher will have the ability to connect individual participants with their responses.

Unique code identifiers will be given to each participant for the purposes of linking personally identifiable information to corresponding survey data. Colleagues and supervisors will not be able to see participants' answers to the questions. After the completion of the survey, the data file will be downloaded from Qualtrics and stored on a password protected computer in Mr. Wallace's

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office. A separate document with the code key will be kept in a restricted-access location away from survey data documents.

All physical documents will be maintained in a locked file cabinet to which only the researcher has access. All electronic documents will be stored in password protected files.

Reports of the findings of the study will not include any personal information that can be linked to participants. Results of the data analysis will be distributed in several ways:

1. Results will be used for presentations at conferences, workshops, and other public forums.
2. Results of this study will be published in Mr. Wallace's doctoral dissertation.
3. Results of this study will be published in scholarly journals.

Study results:

At the conclusion of the study, you will have the right to request feedback about the results. You may contact the faculty advisor, Carsten Schmidtke, PhD., 479-575-4047 or cswded@uark.edu or the Principal Researcher, Bentley Wallace, 501-707-7870 or bewallac@email.uark.edu

Questions about the research:

If you have questions about this research project or your participation in it, please contact the primary researcher or faculty advisor:

Bentley Wallace
Principal Researcher
501-707-7870
bewallac@email.uark.edu

Dr. Carsten Schmidtke
Faculty Advisor
479-575-4047
cswded@uark.edu

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant, or to discuss any concerns about, or problems with the research.

Ro Windwalker, CIP
Institutional Review Board Coordinator
Research Compliance
University of Arkansas
109 MLKG Building
Fayetteville, AR 72701-1201
479-575-2208
irb@uark.edu

CONSENT STATEMENT

I have read the above statement and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I understand that participation is

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voluntary. I understand that significant new findings developed during this research will be shared with the participant. I understand that no rights have been waived by agreeing to the consent declaration.

My clicking on the link below to access the survey indicates that I voluntarily consent for my answers to be used in this research.

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Script for Initial Telephone Communication with Prospective Survey Participants

Prior to distributing the online survey, each prospective participant will be contacted via telephone to confirm their email address, provide basic information about the research study, and to inform them of what to expect as next steps in process. The following script will be used for the initial telephone call:

Hello, this is Bentley Wallace. I am a doctoral student in the Human Resource and Workforce Development Education program at the University of Arkansas. As part of my doctoral dissertation, I am conducting a research study about the perceptions of human resource managers in Arkansas regarding the silver-level Career Readiness Certificate in Arkansas.

The first phase of this research project is a brief online survey with 21 questions. Because your company has employees who possess Career Readiness Certificates, I would like to include someone from your company as a participant in the study.

Are you one of the people at your company who is engaged in the Career Readiness Certificate process? If not, can you recommend another person in human resources or production management who would be better suited to participate?

*After determining that I am speaking to the appropriate prospective participant:

Are you willing for me to include you on the list of prospective participants for the survey?

*If yes:

Please confirm your email address for me. In the coming days, you will receive an email from me (bewallac@email.uark.edu) with basic instructions and a link to the actual survey.

Thank you. In the meantime, if you have any questions please contact me at 501-707-7870 or bewallac@email.uark.edu

Survey Questions:

Name?

Employer?

Position / Title?

Number of employees at site(s) where you work?

Geographic location of site(s) where you work?

- Central Arkansas
- Northeast Arkansas
- Northwest Arkansas
- Southeast Arkansas
- Southwest Arkansas

What is the primary product your company manufactures?

Does your company currently employ individuals who have earned an Arkansas Career Readiness Certificate?

- Yes
- No

Use of the silver-level Career Readiness Certificate decreases employee turnover.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate reduces violations of safety protocol.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of workplace safety to the company's bottom line.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of productivity to the company's bottom line.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of high retention rates to the company's bottom line.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate reduces safety training time of employees.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate as a pre-hire screening tool reduces production training time of employees.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate reduces reworks in production.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate reduces employee injuries.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Productivity goals are more consistently met with use of the silver-level Career Readiness Certificate.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate reduces overtime.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate increases teamwork.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in team members working out interpersonal problems with their team.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in team members working out safety problems with their team.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in team members working out production problems with their team.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Use of the silver-level Career Readiness Certificate results in team members communicating more effectively with their team.

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree

Has your company's decision to use the Career Readiness Certificate provided:

- Increased overall employee performance?
- Decreased overall employee performance?
- No change in overall employee performance?
- Unsure?

Based on your experience with employees who possess a Career Readiness Certificate, would you recommend that your company:


- Increase use of the certificate as a screening tool?
- Decrease use of the certificate as a screening tool?
- Maintain current level of use of the certificate as a screening tool?
- Unsure?

Are you willing to be contacted for a follow-up interview regarding this topic?

- Yes
- No

APPENDIX D: PERMISSION TO USE EXISTING SURVEY INSTRUMENT

7/10/2016 University of Arkansas Mail - Re: Request to Use Survey Instrument

 UNIVERSITY OF ARKANSAS Bentley Wallace <bewallac@email.uark.edu>

Re: Request to Use Survey Instrument
1 message

Barbara Greene <b[REDACTED]n> Wed, Jul 6, 2016 at 8:04 PM
To: Bentley Wallace <bewallac@email.uark.edu>

Bentley,

I am happy to have you use parts of my survey for your research and dissertation. Consider this email my written permission for such. In fact, I am quite flattered you consider my work of such quality you want to use part of it.

Good luck to you as you complete your research and the final work on your dissertation. I know exactly where you are and how happy you will be to have this behind you.

Barbara B. Greene, Ed.D.

Sent from my iPad

> On Jul 6, 2016, at 3:15 PM, Bentley Wallace <bewallac@email.uark.edu> wrote:
>
> Dr. Greene:
>
> Thank you for your time on the phone yesterday evening.
>
> Per our conversation, I am requesting to use a portion of the survey instrument from your doctoral dissertation as a portion of the survey instrument for my dissertation.
>
> The attached document shows the questions from your instrument that I would like to use along with proposed amendments for use in my survey.
>
> Please respond in the affirmative if you are willing to grant permission for use of that portion of your survey.
>
> Thank you.
>
> Bentley Wallace
> University of Arkansas
> 501-707-7870
> <Comparison of Greene Survey Questions and Proposed Changes for use in Wallace Dissertation 7-6-16.pdf>

<https://mail.google.com/mail/u/0/?ui=2&ik=bc2f0ab9de&view=pt&search=inbox&th=155c2e22bcf509&siml=155c2e22bcf509> 1/1

APPENDIX E: COMPARISON OF EXISTING INSTRUMENT QUESTIONS

Greene Dissertation Perception Survey Questions	Variation for Wallace Dissertation Perception Survey Questions	Relates to Wallace Dissertation Research Question
6. Use of WorkKeys decreases employee turnover.	8 Use of the silver-level Career Readiness Certificate decreases employee turnover.	#3. Retention
7. Use of WorkKeys reduces scrap metal.	9 Use of the silver-level Career Readiness Certificate reduces violations of safety protocol.	#1. Safety
8. Use of WorkKeys results in the hiring of employees who realized the importance of reduction of scrap material as it relates to the company's bottom line.	10 Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of workplace safety to the company's bottom line.	#1. Safety
8. Use of WorkKeys results in the hiring of employees who realized the importance of reduction of scrap material as it relates to the company's bottom line.	11 Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of productivity to the company's bottom line.	#2. Productivity
8. Use of WorkKeys results in the hiring of employees who realized the importance of reduction of scrap material as it relates to the company's bottom line.	12. Use of the silver-level Career Readiness Certificate results in the hiring of employees who realized the importance of high retention rates to the company's bottom line.	#3. Retention
9. Use of WorkKeys reduces training time of employees.	13 Use of the silver-level Career Readiness Certificate reduces safety training time of employees.	#1. Safety
9. Use of WorkKeys reduces training time of employees.	14 Use of the silver-level Career Readiness Certificate	#2. Productivity

	as a pre-hire screening tool reduces production training time of employees.	
10. Use of WorkKeys reduces reworks in production.	15 Use of the silver-level Career Readiness Certificate reduces reworks in production.	#2. Productivity
10. Use of WorkKeys reduces reworks in production.	16 Use of the silver-level Career Readiness Certificate reduces employee injuries.	#1. Safety
11. Production deadlines are more consistently met with use of WorkKeys.	17 Productivity goals are more consistently met with use of the silver-level Career Readiness Certificate.	#2. Productivity
12. Use of WorkKeys reduces overtime.	18 Use of the silver-level Career Readiness Certificate reduces overtime.	#2. Productivity
13. Factors other than WorkKeys contributed to the reduction of overtime.	Not a usable question in this section.	N/A
14. Use of WorkKeys increases teamwork.	19 Use of the silver-level Career Readiness Certificate increases teamwork.	#1. Safety #2. Productivity #3. Retention
15. Use of WorkKeys results in team members working out problems with their team.	20 Use of the silver-level Career Readiness Certificate results in team members working out inter-personal problems with their team.	#3. Retention
15. Use of WorkKeys results in team members working out problems with their team.	21 Use of the silver-level Career Readiness Certificate results in team members working out safety problems with their team.	#1. Safety
15. Use of WorkKeys results in team members working out problems with their team.	22 Use of the silver-level Career Readiness Certificate results in team members	#2. Productivity

	working out production problems with their team.	
16. Use of WorkKeys results in team members communicating more effectively within their team.	23 Use of the silver-level Career Readiness Certificate results in team members communicating more effectively with their team.	#1 Safety #2. Productivity #3. Retention

APPENDIX F: PHASE II IRB APPROVAL



Office of Research Compliance
Institutional Review Board

November 21, 2016

MEMORANDUM

TO: Bentley Wallace
Carsten Schmidtke

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #: 16-07-026

Protocol Title: *Silver-Level Career Readiness Certificate in Arkansas*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 11/14/2016 Expiration Date: 08/09/2017

Your request to modify the referenced protocol has been approved by the IRB. This protocol is now approved for Phase II procedures. **This protocol is currently approved for 100 total participants.** If you wish to make any further 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.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 109 MLKG Building.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

APPENDIX G: PHASE II CONSENT FORM AND INTERVIEW QUESTIONS

Consent Form for Qualitative Interviews to be conducted in-person, by telephone, or by video conference:

The following consent form will be used with all interview participants, including pilot-testing regardless of interview methodology (in-person, telephone, or video conference) and will serve as the method for obtaining consent from participants. For in-person interviews, the form will be signed at the beginning of the interview meeting. For telephone or video conference interviews, the consent form will be emailed, signed, and returned to the researcher prior to the start of the interview.

INVITATION TO PARTICIPATE

You are invited to participate in an interview about the silver-level Career Readiness Certificate in Arkansas because you agreed to being contacted for follow up to the related online survey that you completed. To participate in this interview, please read this informed consent statement and, if you still agree to participate, sign and date the form. After signing, please return the document by scanning the signature page and emailing it to bewallac@email.uark.edu or you may return the form in person at the time of the interview.

WHAT YOU SHOULD KNOW ABOUT THE RESEARCH STUDY

Principal researcher for this project is:

Bentley Wallace
c/o Pulaski Technical College
3303 E. Roosevelt Road
Little Rock, AR 72206
501-707-7870 cell
501-907-6670 office

Faculty advisor for this project is:

Dr. Carsten Schmidtke
Assistant Professor, College of Education and Health Professions
Rehabilitation, Human Resources and Communication Disorders
371 Maple Street
133B Graduate Education Building
University of Arkansas
Fayetteville, AR 72701
Phone: 479-575-4047
cswded@uark.edu

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Purpose of this project:

The purpose of this study is to gather the perceptions of human resources managers at manufacturing firms in Arkansas relative to the effectiveness of using the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool.

Project participants:

Human resource managers at manufacturing firms in Arkansas which use the silver-level Arkansas Career Readiness Certificate as a pre-hire screening tool.

Procedure:

Your participation in this phase of the study will consist of participating in an interview of 45 to 60 minutes regarding your experience with employees at your company who have an Arkansas Career Readiness Certificate. Interviews will be conducted in person at a location of your choice. If an in-person interview is not feasible, you may choose Skype or a telephone interview. Interview questions will cover topics such as your involvement in the Career Readiness Certificate program at your company, your perceptions of how safety, productivity, and retention are impacted by employing individuals who have earned a Career Readiness Certificate, etc. Your interview will be audio recorded using a digital recorder with your permission and transcribed for the purpose of accuracy. You will receive a copy of the transcript so that you may verify that your words have been captured correctly. The interviewer will also take written notes during the interview.

Possible risks or discomforts:

There are no known risks associated with this study that are greater than those ordinarily encountered in daily life.

Benefits:

There are no personal benefits to participants, but the findings may help clarify the usefulness of the silver-level Arkansas Career Readiness Certificate.

Compensation and cost:

There is no cost associated with participating in the interview. You will not be compensated for your participation.

Option to not participate:

You are in no way required to participate in this study. Also, you may choose to stop participating at any point after starting the interview. There are no negative consequences for not participating.

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Confidentiality:

All interview transcripts, sound files, and other information obtained from participants will be kept confidential to the fullest extent of the law and University of Arkansas policy. There are no foreseeable risks in maintaining confidentiality.

Participant names, employer names, and contact information will be known to the researcher only. No personally identifiable information will be included in the data analysis results. No person other than the researcher will have the ability to connect individual participants with their responses.

Names of participants, the names of any persons mentioned in the conversation, and names of places will be changed to protect participant identity and maintain confidentiality. All electronic documents such as original recordings will be stored in password protected files on Mr. Wallace's computer hard drive. All physical documents will be maintained in a locked file cabinet to which only the researcher has access.

Participant responses and their analysis will be used for completion of this research study, which is part of Mr. Wallace's doctoral dissertation in the University of Arkansas's Human Resource and Workforce Development Doctor of Education program. Reports of the findings will not include any personal information that can be linked to participants. Results of the data analysis will be distributed in several ways:

1. Results will be used for presentations at conferences, workshops, and other public forums.
2. Results of this study will be published in Mr. Wallace's doctoral dissertation.
3. Results of this study will be published in scholarly journals.

As a result of the plans for distribution, the original recordings will be kept for a minimum of seven years. At the end of the seven-year time period, sound files will be erased from the computer hard drive, and interview transcripts will be shredded.

Questions about the research:

At the conclusion of the study, you have the right to request feedback about the results. If you have questions about this research project or your participation in it or if you wish to obtain study results, please contact the primary researcher or faculty advisor:

Bentley Wallace
Principal Researcher
501-707-7870
bewallac@email.uark.edu

Dr. Carsten Schmidtke
Faculty Advisor
479-575-4047
cswded@uark.edu

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant or to discuss any concerns about or problems with the research.

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Ro Windwalker, CIP
Institutional Review Board Coordinator
Research Compliance
University of Arkansas
109 MLKG Building
Fayetteville, AR 72701-1201
479-575-2208
irb@uark.edu

Participant Rights:

As a participant in this research, you are entitled to know the nature of my research. You are free to decline to participate, and you may choose to stop the interview or withdraw from the study at any point. No penalties or risks are associated with not participating or withdrawing your participation. Feel free to ask any questions at any time about the nature of the research or the methods I am using.

CONSENT STATEMENT

I have read the above statements and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I understand that participation is voluntary. I understand that significant new findings developed during this research will be shared with the participant. I understand that no rights have been waived by agreeing to the consent declaration.

My signing below indicates that I voluntarily consent for my answers to be used in this research.

Signature of Participant

Date

Signature of Researcher

Date

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Script for Telephone Communication with Prospective Interview Participants

Prior to conducting interviews, each prospective participant will be contacted via telephone to confirm their willingness to be interviewed and to determine the best method for conducting the interview.

Hello, this is Bentley Wallace. I am following up to the online survey you recently completed as part of the doctoral dissertation research I am conducting. As you will recall, the research study is focused on the perceptions of human resource managers in Arkansas regarding the silver-level Career Readiness Certificate in Arkansas.

The next step in the research involves conducting interviews with those individuals who completed the online survey and agreed to be contacted for further exploration of the topic. The preferred method of interview will be in-person, but if a face-to-face meeting is not possible, telephone or video conference interviews are also an option. Are you still willing to participate in a confidential interview that will last approximately 45 to 60 minutes?

*If yes: Determine time, location, and methodology for interview. If the interview is to be conducted by telephone or video conference, coordinate emailing the Informed Consent document to the participant for review, signature, and return to researcher.

Conclude with:

Thank you. I will be sending you an email with confirmation of our plans for the interview, a copy of the informed consent document we just discussed, and further instructions for completing the informed consent document. If you have any questions, please feel free to email or call.

*If no: Thank the participant for their completion of the survey.

INTERVIEW QUESTIONS:

1. Tell me about your position here at (company name).
 - a. How long have been in this role?
 - b. What brought you here?
2. Have you done similar work at other companies?
3. Were you involved in bringing the CRC to your company?
 - a. What was that experience like?
 - b. What led to the company's decision to participate in the CRC program?
4. If you weren't involved in bringing CRC to your company:
 - a. how was the initiative described to you?
 - b. How did you become involved?
5. How often is the CRC a topic of conversation among the leadership team at (company name).
 - a. When the CRC is discussed, is it discussed positively or negatively?
 - b. Can you provide an example of those conversations?
6. When you think about employees who have the CRC vs. those who don't, what stands out in your mind the most about the overall performance of those CRC employees?
 - a. Has that opinion changed over time? If so, how?
7. What is your opinion regarding safety performance of employees who have a silver-level CRC.
 - a. Do you have any specific examples of safety performance in connection with CRC holders?
8. What is your opinion regarding productivity of employees who have a silver-level CRC.
 - a. Can you give an example of productivity in connection with CRC holders?
9. What is your opinion regarding retention of employees who have a silver-level CRC.
 - a. Is there an example of how CRC holders are retained compared to non-CRC holders?

10. When you compare safety, productivity, and retention, which of those areas is most impacted by having employees with a CRC?
 - a. Why do you think that is?
11. If you were asked to make a decision about the future of using the CRC at your company, what would your recommendation be?
 - a. Why?
12. Are there any other thoughts about the Career Readiness Certificate you would like to share? Is there anything I have not asked about that you think should be mentioned?

APPENDIX H: EMAIL COMMUNICATION WITH PARTICIPANTS

Bentley Wallace <bewallac@email.uark.edu>

Career Readiness Certificate Survey

Bentley Wallace <bewallac@email.uark.edu>

Fri, Sep 23, 2016 at 8:23 AM

To: [REDACTED]

Mr. [REDACTED]:

Thank you for agreeing to share your perceptions regarding the Career Readiness Certificate.

The survey can be accessed at this link: http://uark.qualtrics.com/SE/?SID=SV_0oGqX3aP9avtHy5

I appreciate your time and assistance.

Bentley Wallace

Doctoral Candidate

University of Arkansas - Fayetteville



Bentley Wallace <bewallac@email.uark.edu>

Fwd: Career Readiness Certificate Survey

Bentley Wallace <bewallac@email.uark.edu>

Tue, Sep 27, 2016 at 10:12 AM

To: [REDACTED]

Ms. [REDACTED]:

Good morning. I am touching base to make sure you received the email and link below. Thanks, again, for your willingness to complete this survey.

Your participation will be an important part of this research project. Please let me know if you have any questions or are experiencing any trouble opening the survey.

Bentley

----- Forwarded message -----

From: **Bentley Wallace** <bewallac@email.uark.edu>

Date: Thu, Sep 22, 2016 at 11:00 AM

Subject: Career Readiness Certificate Survey

To: [REDACTED]

[REDACTED]

Thank you for agreeing to share your perceptions regarding the Career Readiness Certificate.

The survey can be accessed at this link: http://uark.qualtrics.com/SE/?SID=SV_0oGqX3aP9avtHy5

I appreciate your time and assistance.

Bentley Wallace

Doctoral Candidate

University of Arkansas - Fayetteville



Bentley Wallace <bewallac@email.uark.edu>

Interview Time and Consent Form

Bentley Wallace <bewallac@email.uark.edu>

Mon, Dec 5, 2016 at 3:54 PM

To: [REDACTED]

[REDACTED]:

Thanks, again, for agreeing to a follow-up interview as part of the Career Readiness Certificate research I am doing at the University of Arkansas - Fayetteville.

I will call you at 8:00 a.m. on Tuesday, December 13th.

Please read the attached Informed Consent document. This document is required by the University to make sure that interview participants understand the purpose of the research and their rights before, during, and after the interview.

If you agree to the information in the consent document, please sign the last page then scan and email that page back to me prior to our telephone interview. I have to have that document back before I can do the interview.

I will be recording our interview with a digital recorder so that I can transcribe the interview later. As you will see in the consent document, your identity and answers will be kept confidential.

Let me know if you have any questions. If not, I'll look forward to receiving your signed consent form via email and talking to you again on the phone.

Thank you.

Bentley Wallace

[REDACTED]

Wallace CRC Research Consent Form.pdf
270K