
Measuring High School Senior Students Workforce Competencies

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This study analyzes workforce competencies at the conclusion of high school graduation. Researchers sampled 580 graduating seniors from 16 high schools within three counties -throughout West-Central Ohio. Results highlight future career and educational goals of these young people and a self-report of skills based on the SCANS competencies and basic foundation skills. There are eight areas the Secretary's Commission on Achieving Necessary Skills (commonly known as SCANS) identified as being essential for both students who are going directly to work after high school and those who will attend college before entering the workforce (McKay, 2016). The five competencies and three foundation skills are intertwined—they are used together and should be learned together (McKay, 2016). Although the SCANS list was developed a while ago, it is still relevant for today's and tomorrow's workforce (McKay, 2016).

The forces shaping the future of the United States workforce (Karoly & Panis, 2004) include a gradual decrease in the labor force growth rate as the Baby Boomers retire, acceleration of technological change, increase of economic globalization, increase in the rate of transition to decentralized business models, and the demand for more flexible and knowledge-based employees. Demographic changes will have significant impacts on the labor market. Baby boomers decision to continue employment or seek retirement will affect not only the demand for labor, but the leadership and experience-set employers are looking for. Job skill requirements have been changing in all sectors of employment. Technological advances have progressed to the point that more routine labor functions are now being replaced by machines. The increased use of computers to generate data has

increased the demand for skill sets in problem solving and data analysis (Karoly & Panis, 2004). According to the Commission on the Skills of the American Workforce (2006), many well-paying and routine middle-class jobs are rapidly being automated.

Flatter organizational structures focused on decentralized decision-making and team-focused work will require enhanced communication skills, leadership, and teambuilding skills. Technology will further expand the prevalence of non-traditional work arrangements (telecommuting, working from home, etc.). Employers everywhere have access to a worldwide workforce composed of people that do not have to be physically present to participate in work teams or to contribute to an organization (Commission on the Skills of the American Workforce, 2006). Outsourcing is a current tool used as organizations evaluate steps in the production or service chain to determine most effective methods. There are opportunities for other people or organizations to deliver tailored services to meet specific components of a production chain or service sector. For example, Indian engineers may make \$7,500 compared to \$45,000 for a comparable American engineer (National Assoc for Education and the Economy, 2006). The demand for a more adaptable and flexible staff will increase the percentage of workers in non-traditional work arrangements such as contract or consultant work or short-term employment assignments (Karoly & Panis, 2004). Today's employers demand a more skilled employee. In the U.S. less than 20% of the workforce is in jobs classified as unskilled (Lynch, 2000). More than half of our young people leave school without the knowledge or foundation required to find and hold a good job (SCANS 1991, p. xv).

According to the US Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS Report, 1990), the demands for the current workforce require adaptability and the ability to learn and work in teams. The SCANS report states "more than half of our young people leave school without the knowledge or foundation required to find and hold a good job." The SCANS report focused on three conclusions addressing what work requires of schools: 1) All American high school students must develop a new set of competencies and foundation skills if they are to enjoy a productive, full, and satisfying life; 2) The qualities of high performance that today characterize our most competitive companies must become the standard for the vast majority of our companies, large and small, local, and

global; 3) The nation's schools must be transformed into high-performance organizations in their own right.

The SCANS report (1990) identified five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance. Competencies included: Resources, Interpersonal Skills, Information, Systems, and Technology. Resources were defined as allocating time, money, materials, space and staff. Components of interpersonal skills included working on teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds. "Information Know-How" would encompass acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information. Understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems are components of systems competency. Technological competency would describe workers who can effectively select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot technologies.

Three foundation competencies were also identified by the SCANS report (1990) including Basic Skills, Thinking Skills, and Personal Qualities. Competence in basic skills would include reading, writing, arithmetic and mathematics, speaking and listening. Thinking skills would comprise thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn, and reasoning. Individual responsibility, self-esteem, sociability, self-management, and integrity defined Personal Qualities in the SCANS report.

According to SCANS (1990), these competencies differ from a person's technical knowledge. The report suggests that classroom instruction must help students apply what they are learning to real-world situations. Students need an opportunity to recognize and solve problems (SCAN Report, 1990). SCANS also developed a "level of competence" to describe the varying proficiency levels ranging from "Preparatory" to "Specialist." (SCANS, 1990).

Cotton (2007) groups employability traits into basic skills, higher-order thinking skills, and affective skills and traits. Basic skills are comprised of oral communication, reading and following directions, basic arithmetic, and writing. Problem solving, learning skills, creative thinking, and decision-making skills comprised higher-order thinking skills. Affective skills and traits

focus on attributes such as responsibility, positive attitude, cooperation, honesty, self-discipline, flexibility, and self-confidence.

Skills Gap

The Smith Hughes Act of 1917 established federal support and involvement in career and technical education (CTE) programs (Fletcher, 2006). There is a general consensus that our educational system has not adequately prepared students for the necessary skills for the 21st Century demands in college, workforce, and community (Soule & Warrick, 2015). A deficiency in higher order thinking skills as well as technical skills in designing, making, and repairing technologies is evident by the mismatch in the workforce and current job demands (Soule & Warrick, 2015).

A study conducted by the National Association of Manufacturers and Deloitte Consulting (2005) found that today's skill shortages are broad-based and deep, impacting more than 80% of companies surveyed. The deficiency of available skilled labor has impacted production and productivity and the ability of these manufacturers to meet customer demands. Ninety-percent of manufacturing companies indicated a moderate to severe shortage of qualified skilled production employees (front-line workers, machinists, technicians, etc.). Engineers and scientists are also needed with 65% of manufacturers indicating a lack of supply of these educated and skilled employees. Not only are the expected high levels of retirements of skilled baby boomer employees going to impact skilled labor availability but the upcoming availability of skilled trained employees is not anticipated to meet demand. Manufacturing employers cite dissatisfaction with K-12 education systems in terms of their ability to effectively train future employees. When asked whether K-12 schools are doing a good job preparing students for the workplace, 84% of the respondents indicated "no" (NAM & Deloitte, 2005). They also are frustrated by the decline in the number of people seeking advanced training and post-secondary degrees in science and engineering. NAM and Deloitte (2005) found that 74% of manufacturing industry respondents in their study indicated that having a "high performance workforce" will be key to their business success. Not only are manufacturers concerned about technical skills in the labor market, but they also identify ability to work in teams, computer skills, literacy, and supervisory and management skills as essential to future success. Toepfer (1997), suggests that educational systems will need to adapt to new employment realities. The jobs that youth are

preparing for today may not be created, the technological advancement has been so rapid that entire career fields are being created. Workers will be required to learn the skills that evolving opportunities will require and the educational system must adapt to meet changing needs of students (Toepfer, 1997). Involvement of all components of the community are necessary to develop school and community programs to deal with the development of work-related competencies and skills needed in the communities, particularly those in rural areas.

Manufacturing companies not only are concerned about the impending impact of a shortage in skilled labor, many are implementing processes to try to minimize its impact on productivity and business success. Seventy-three percent of manufacturers in NAM and Deloitte study conducted in 2005 were conducting training for their employees due to business necessity. Innovative and competitive recruitment strategies, implementing more employee-friendly work environments (flexible schedules, tuition reimbursements, etc.), and utilizing more temporary employment are methods used to expand available skill base for employers.

Ferry (2003) conducted a study of employment related needs in rural central Pennsylvania. Major employers reported that employees lacked basic communication, problem solving, and team working skills to perform effectively in their worksites. In addition, these employers indicated that computer skills as essential to future success in their business operations. Similar to western Ohio, rural Central Pennsylvania employers reported that they are challenged to be competitive within a global marketplace. Rural central Pennsylvania's economy is transitioning from being agriculture and manufacturing-based to a service-based economy (Ferry, 2003). Technology is a major factor changing rural jobs in the area and is creating new skill set demands for rural employers. Employers in this study indicated that they were having difficulty with turnover in entry-level, low-skilled positions that tend to have low pay.

Research Objectives

The objectives of this research study were to analyze the workforce skills of high school graduates in West-Central Ohio, based on SCANS (Secretary of US Department of Labor Commission on Achieving Necessary Skills, 1990).

Specific components included:

How do youth evaluate their 3 Foundation Skills

- Personal Qualities (Integrity/Honesty, Self-Esteem, Sociability, Responsibility, and Self-Management)
- Basic Skills (Listening, Reading, Writing, and Math)
- Thinking Skills (Problem-Solving, Decision-Making, and Reasoning)

How do youth evaluate their Workforce Competencies

- Using Resources (Time, Materials, Human Resources, Money)
- Using Information (Computers, Organizational, Interpreting Information, and Reasoning)
- Technology (Selects, Applies, Maintain, and Troubleshoot)
- Interpersonal Skills (Team-Work, Teaching, Customer Service, Negotiation, and Working with Diverse Audiences)
- Managing Systems (Performance in Systems, Improve Systems, Design Systems)

How do youth evaluate the impact of formal educational coursework, volunteering, paid employment, and extracurricular activity involvement as contributing factors to foundation and competency workforce skill development?

Methods

This descriptive and correlation study was conducted in spring of 2017 to assess workforce competencies of graduating high school youth in West-Central Ohio. Sixteen high schools were identified in six study counties (Mercer, Putnam, and Hardin Counties). After receiving approval from Ohio State University Human Subjects Review, a web-based survey instrument was administered in 16 cooperating West-Central Ohio High Schools with 580 high school seniors providing usable instruments for this research project. Anonymity and confidentiality of participants and their individual responses were maintained throughout the project.

Data analysis using SPSS was utilized to evaluate multiple components of the research. Descriptive statistics analyzed overall youth

ratings of workforce skill developments and contributing factors to skill development.

Results

Demographic Data

This sample of students from 16 cooperating school districts in six West-Central Ohio Counties (Mercer, Putnam, and Hardin) is comprised of 580 high school seniors (as of May 2017). Approximately 52% of the sample was female. A large number of their parents were employed in the management/professional, manufacturing, and skilled trades as professions. A relatively low percentage of the parents of these high school seniors had completed Bachelors or Graduate Degrees (approximately 42% of mothers and 30% of fathers).

The majority of respondents indicated that their parents were originally from West-Central Ohio with over 80% of both parents being from the area. The vast majority of these West-Central Ohio High School Seniors were employed at-least part-time. Over 70% of these seniors indicated that they were working 11 hours or more per week. At the end of their high school programs, most reported that they were not allocating a large amount of time studying per week. Over 84% of high school seniors indicated that they were allocating two or less hours per week studying. More than half of the respondents indicated that they were actively engaged in volunteer work on a weekly basis. A sizable number (7.26%) were volunteering more than five hours per week.

High School Seniors reported relative success in their academic work (when analyzing High School Grade Point Average). The strongest ratings on workforce skills were found on the social-dynamics related questions (Table 1). The top five rated components included: making ethical decisions, working cooperatively with others, personal relations, managing time/following directions, and goal setting/self-control. The lowest skills being self-evaluated by respondents tended to be on components assessing technology use, mathematical skills, and the development of reports/writing skills (Table 1).

Conclusions

The self-report of high school graduating seniors throughout West-Central Ohio indicates a perceived stronger skill set in the social-dynamic skills of workforce competencies as compared to technology, mathematical,

and financial skills. The low competency scores related to technology effectively is a surprise. We might hypothesize that the competencies in this area would have rated higher, given the fact that many schools have integrated Chromebooks and IPADS into classroom teaching over the last 5-10 years and a much higher percentage of students are using smartphones/internet daily. Nearly three-quarters of teens have or have access to a smartphone and aided by the convenience and constant access provided by mobile devices, 92% of teens report going online daily (Lenhart, 2015). Assumingly, these devices and their apps are effectively used for downloading and uploading assignments, organizing school work, communicating, and designing projects within the classroom. Further exploration into the disconnect of the self-reported low competency in using technology effectively and the relationship to these daily uses of devices by students would be interesting.

An area that shows promise among graduating high school students in the survey is high self-reported competency scores in the social-dynamic area or “soft skills.” Soft skills are those desirable qualities that apply across a variety of jobs and life situations—traits such as integrity, communication, courtesy, responsibility, professionalism, flexibility, and teamwork (Greene, 2016). Today's employers perceive a lack of soft skills among recent graduates (Greene, 2016). More than 75% of employers surveyed in a study conducted by Seattle Jobs Initiative indicated that soft skills were as important as – or more important than – technical skills in securing entry-level employment and success (Pritchard, 2013). It appears our students in the survey feel confident that they have been given the tools to demonstrate strong ethics, teamwork/collaboration, the ability to adapt, and be polite. Work environments are rapidly changing, restructuring and/or reinventing in efforts to innovate and stay relevant. The millennial generation is now entering employment in vast numbers and will shape the world of work for years to come. The ability to be adaptable and flexible will continue to be an enormous asset in the workplace.

Post-Secondary Institutions should be cognizant of the strengths and weaknesses in the skills sets students are entering their respective educational training programs with as well as the expectations of employers in today's economy. Curriculum should be designed to address deficiencies and build broad-based skills in our graduates to prepare them to be successful in the workplace. We are seeing significant efforts being taken by local high schools to connect their schools, students, and their teachers with

local business and industry. Job Shadowing, Career Speakers, and the emphasis on STEM-based education and project-based learning are examples of how local school systems in West-Central Ohio are addressing the need to prepare graduates with workforce skills needed in today's environment.

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Personal Biography

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