PERCEPTIONS OF SOFT SKILLS AMONG STUDENTS AND FACULTY
WITHIN A SCHOOL OF DESIGN AND MANUFACTURING

by

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ABSTRACT

Employers continually emphasize the importance of soft skills as a crucial element of success for their employees and point to a lack of incorporated soft skills training within the traditional higher education curriculum. This study examined the perceptions of both students and faculty in regard to the importance of soft skills on a student's academic and career success and evaluated the perceptions of students and faculty in terms of the incorporation of soft skills training in the curriculum.

This quantitative study used a descriptive comparative design to analyze survey data from students (N = 94) and faculty (N = 13) at a public Midwestern regional master's-level university. Data included information from faculty and students in their final year of the welding engineering, plastics engineering, and manufacturing engineering programs.

Data collection occurred through an online questionnaire wherein participants articulated their perception of curricular, educational, and career opportunity related to soft skill development.

Findings revealed that both students and faculty within the School of Design and Manufacturing believe that soft skills are important components to both academic and career success. In addition, students generally believed that they had been taught the skills at a higher rate than faculty perceive teaching the skills. Furthermore, the data and findings of this study provide a baseline for open dialogue among and between students, faculty, administrators, and

employers concerning alignment and importance of soft skills within the curriculum and the

workplace.

KEY WORDS: Soft skills, design and manufacturing, perceptions, student survey, faculty survey

DEDICATION

This study and subsequent research composed in this dissertation is dedicated to my wife, Mandy, and my children, Ashlyn and Nolan, who have continually pushed me to succeed and encouraged me to fulfill this lifelong goal. Thank you for the many sacrifices you have made along this journey. It is also dedicated to my mother and father, who have instilled in me the work ethic, drive, and motivation to conquer all obstacles.

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CHAPTER I: INTRODUCTION

INTRODUCTION

Employers continue to discuss the importance of soft skills within their organizations and how these skills are scarce among potential candidates (Chakraborty, 2009). In addition, Beard, Schwieger, and Surendran (2008) noted that educators have pursued attempts to incorporate soft skills into their curriculum as pressure from professional organizations, employers, and accrediting agencies continues to mount. While employers and educators both appear to understand the importance of soft skills, there is still an extensive gap between the expectations of employers and the reality of what colleges and universities are producing. Furthermore, there is little research on perceptions of soft skills among college faculty and students.

This chapter provides background information and a contextual framework for the reader to better understand issues associated with the need for soft skills. This chapter discusses the history of soft skills, offers a definition of the term as well as the skills typically included, terminology often used synonymously, and how the desire for soft skills evolved over time. Additionally, this chapter outlines the importance of soft skills both in the context of the workforce and within higher education.

HISTORY OF SOFT SKILLS

       The origin of the first reference to the importance of non-technical skills dates back over a century to a 1918 study conducted by Harvard University, the Carnegie Foundation, and Stanford Research Center. This study concluded 85% of job success comes from having well-developed soft and people skills, while only 15% of job success comes from technical skills and knowledge or hard skills (Mann & Joint Committee on Engineering Education of the National Engineering Societies, 1918). According to Wright (2018), a more direct connection to the term *soft skills* dates to 1972 when the U.S. military realized factors such as leadership skills were as important as machine skills. Wright also noted the name most closely related to the creation of soft skill terminology is Paul G. Whitmore. Whitmore's research led him to understand there was a large contrast between working with something that is physically hard, like a machine, and anything else that is soft, which cannot always be seen in a tangible sense (Wright, 2018).

       The realization of this need for additional skills spanned across continents as well. In 1986, the Business and Technology Education Council (BTEC) in the United Kingdom developed a list of eight *Common Skills and Core Themes* and included numeracy, learning and studying, identifying and tackling problems, design and visual discrimination, information gathering, communicating, information processing, and working with others (Laughton & Montanheiro, 1996). In 1991, the BTEC updated the list to include managing and developing self, working with and relating to others, communicating, managing tasks and solving problems, applying numeracy, applying technology, and applying design and creativity (Laughton & Montanheiro, 1996).

While the relevance and realization that skills beyond hard, technical skills existed throughout the last century, the interpretation of the meaning and the exact skills remained fluid to meet the changing demands of industry and a global society. As these industrial demands continue to evolve, the specific soft skills required by employers will change with emergent economic and labor force requirements.

DEFINING SOFT SKILLS

Defining soft skills is challenging due to the vagueness and diversity of what constitutes a soft skill. Soft skills are known by many names, and within the context of those names, the skills themselves are labeled and grouped in different ways. Given this diversity of expression, it is important to define what is meant by the term *soft skills* and distinguish these skills from concepts associated with specific content areas or technical knowledge. Soft skills are not the technical or hard skills associated with occupations, such as the technical procedures or practical tasks that are often observable, quantifiable, and measurable (Shakir, 2009). These skills are concrete and more easily assessed for levels of knowledge and mastery. Soft skills are less visible in the physical sense, but often much more visible from a societal norm and behavioral perspective.

Most definitions of soft skills focus on the non-tangible and non-technical competencies associated with a person's personality, attitude, character, and ability to interact with others in a professional environment (Cotet, Balgiu, & Zaleschi, 2017; Robles, 2012; Stewart, Wall, & Marciniec, 2016). Perhaps the most encompassing definition comes from Renuga and Ezhilan (2014), who refer to soft skills as the "non-technical, intangible, people, corporate, emotional intelligence, employability, life, generic, key, essential, and transferrable skills" (p. 88). Other

definitions of soft skills focus on the influence and persuasion of a person's interpersonal skills and how those skills impact job performance and career prospects (Pachauri & Yadav, 2013; Riggio & Saggi, 2015). Finally, most definitions of soft skills include a reference, or resemblance, to skills associated with communication, teamwork, leadership, and problem solving.

While definitions of soft skills often focus solely on the skills of the worker, Yorke (2006, as cited in Saunders & Zuzel, 2010) applied the definition of soft skills to the context of a college student. Yorke defined soft skills as "a set of achievements—skills, understandings and personal attributes—that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community, and the economy" (p. 1). The inclusivity of the workforce, community, and economy sets this definition apart from the others as it implies the depth and breadth of the value of soft skills regardless of how it is defined or what those skills are called.

The definition of soft skills used for this study is as follows: Soft skills can be defined as the interpersonal skills associated with a person's personality, attitude, character, and ability to interact with others in a professional environment, especially as it relates to skills such as communication, teamwork, collaboration, leadership, critical thinking, problem solving, creativity, and innovation (Cotet et al., 2017; Robles, 2012; Stewart et al., 2016).

SOFT SKILLS BY OTHER NAMES

While the term *soft skills* is common, other phrases also appear throughout the literature and throughout the workforce. These other terms, often used synonymously with the term *soft skills*, include the following:

- 21st Century Skills – The term *21st century skills* refers to a broad set of knowledge, skills, work habits, and character traits that are critically important to success in today's academic and workforce domains (21st Century Skills, 2016).

- Baseline Skills – Baseline skills are a universal set of skills needed in any workplace that consistently appear in job postings across broad bands of industries and occupations (Burning Glass Technologies, 2019).

- Career Readiness Skills – Career readiness is the attainment and demonstration of requisite competencies that broadly prepare college graduates for a successful transition into the workplace (National Association of Colleges and Employers, 2019).

- Employability Skills – Employability skills are core skills and traits that make someone desirable to an organization and that are needed in virtually every job (Doyle, 2020).

- Interpersonal Skills – Interpersonal skills are the skills used to interact with other people, including communication, listening, questioning, and emotional intelligence (SkillsYouNeed, 2019).

Additional terminology used within the construction of the competency model generated by the U.S. Department of Labor (Competency Model Clearinghouse, 2019) illustrates the skills needed within specific industry fields. In the competency model, skills are classified into three realms: (a) foundational skills, (b) industry-related skills, and (c) occupation-related skills. Within this model, the foundational skills are then broken into three specific competencies: (a) personal effectiveness competencies—interpersonal skills, integrity, professionalism, initiative, dependability and reliability, and a willingness to learn; (b) academic competencies—reading, writing, mathematics, science and technology, communication, critical and analytic thinking, active learning, and basic computer skills; and (c) workplace competencies—teamwork, adaptability/flexibility, customer focus, planning and organizing, creative thinking, problem solving and decision making, working with tools and technology, workplace computer applications, scheduling and coordinating, checking, examining and

recording, and business fundamentals. Soft skills, as traditionally defined, fall within the personal effectiveness competency and workplace competency realms.

SOFT SKILLS OVER THE YEARS

In the past, the U.S. economy grew through industrialized occupations that relied mainly on routine and very specific technical skills; however, the workplace of today requires a much greater range of skills from workers (Berger, 2016). While advances in technology and changes to the global economy continue to change the technical skills employees need, the soft skills employers seek do not seem to reflect this same drastic change, as evidenced by the 1918 Harvard Study of Engineers and the 1972 report on military leadership skills (Mann & Joint Committee on Engineering Education of the National Engineering Societies, 1918; Wright, 2018). In fact, the overall themes of required soft skills remain relatively constant over the years. Table 1 provides data on the percentage of employers who believe specific soft skill attributes are important to employee success. In addition, the table reflects where each attribute ranked between 2014 and 2018 according to employer feedback (National Association of Colleges and Employers, 2014, 2016a, 2018). Analysis of these data reflects consistency among eight soft skills. According to the World Economic Forum (2016a), *The Future of Jobs* report points out that soft skills remained relatively constant throughout the past, and it is likely they will not change in the near future.

Table 1: *Attributes Employers Seek on a Candidate's Resume*

NATIONAL ASSOCIATION OF COLLEGES AND EMPLOYERS (NACE) JOB OUTLOOK	2014		2016		2018	
ATTRIBUTES	%	RANK	%	RANK	%	RANK
Communication skills (written)	76.6	1	70.2	3	80.3	3
Leadership	76.0	2	80.1	1	72.6	4
Analytical/quantitative skills	73.1	3	62.7	8	67.5	6
Strong work ethic	72.0	4	68.9	6	68.4	5
Ability to work in a team	71.4	5	78.9	2	82.9	2
Problem-solving skills	70.3	6	70.2	4	82.9	1
Communication skills (verbal)	68.6	7	68.9	5	67.5	7
Initiative	68.6	8	65.8	7	67.5	8
Detail-oriented	65.7	9	52.8	13	64.1	9
Computer skills	62.9	10	55.3	12	48.7	13
Technical skills	61.1	11	59.6	10	59.8	11
Flexibility/adaptability	59.4	12	60.9	9	60.7	10
Interpersonal skills	58.3	13	58.4	11	54.7	12
Organizational ability	42.9	14	48.4	14	48.7	14
Strategic planning skills	33.7	15	26.7	16	39.3	15
Friendly/outgoing personality	32.6	16	35.4	15	27.4	17
Entrepreneurial skills/risk-taker	23.4	17	18.6	19	19.7	19
Tactfulness	22.9	18	20.5	18	22.2	18
Creativity	21.7	19	23.6	17	29.1	16
Fluency in a foreign language	NA	NA	NA	NA	4.3	20

(National Association of Colleges and Employers, 2014, 2016a, 2018)

IMPORTANCE OF SOFT SKILLS IN THE WORKPLACE

Employers seek workers capable of professional behavior. They expect employees to be

able to work both independently and as a part of a team, able to solve problems through

critical and creative thinking, and able to step into leadership roles when the opportunity presents itself (Harris, 2020). According to Spisak (2015), 75% of career success results from soft skills that employees possess, and not on the hard skills typically associated with educational knowledge. Additionally, in a study conducted by Kyllonen (2013), non-cognitive skills (soft skills) were a greater predictor of earnings and employment potential.

It is evident that soft skills appear as requirements in all occupations. While many skills may be specific to a certain career field, most soft skills are transferable and not specialized like technical skills. This is not to say that all skills are valued the same in every occupation. To understand the importance of soft skills to each unique workplace, it is important to consider that the value of each skill is based on the context of the work being done. Schulz (2008) noted that "training in cultural awareness might be useful for a chemist but is an absolute necessity for public or human resource management in societies of diverse cultures" (p. 147).

The importance employers place on soft skills within the workplace is an aspect that employees must comprehend in order to develop strategies to improve these skills. Yet, according to Thacker and Yost (2002), employers find many college graduates lacking the necessary soft skills to perform well in their occupation. While the soft skills described among employers are often the same skills taught on the first day of elementary school (communication, leadership, teamwork, problem solving, etc.), these skills appear less frequently in secondary and postsecondary classrooms.

INCREASING OF SOFT SKILLS IN EDUCATION

Institutions of higher education face the challenge of creating institutions of learning that foster a growth within students that meet the demands of the labor market. According to

Beard et al. (2008), the integration of soft skills into a college curriculum should be part of a strategic process involving identification of goals and objectives, development of activities and methods, specification of the assessment process, and a continual evaluation to strengthen the overall process. Spisak (2015) noted that in order to successfully implement soft skills into a college curriculum, it must be a priority of the entire school, from faculty to administration.

Many of the skills students require to aid their collegiate success transfer into the soft skills employer's desire. These include skills such as creative thinking, responsibility, communication, ability to follow directions, goal setting, problem solving, questioning skills, ability to use technology, strong work ethic, time management, and teamwork. Pereira and Costa (2017) suggested the curriculum provide students with an array of skills adequate for the changing demands of society, and with these changes comes a complexity that requires soft skills to navigate successfully. The need for specific soft skills remains unchanged over the years; therefore, adding these skills into the curriculum early in the students' academic career would allow students to work on developing soft skills for an extended time and contribute to greater proficiency without fear the skills will change before graduation, which is often the case with more technical skills.

Pereira and Costa (2017) posited that if an academic curriculum is meant to serve as preparation for the opportunities of a career, the skills required for competency in the workplace should be taught within the curriculum. Aresta, Pedro, Moreira, and Santos (2013) explained that "there is a need to recognize learning as a social process that allows students to develop competencies beyond the formal curriculum: critical thinking and innovation, teamwork and leadership, flexibility and communication skills" (p. 20). In the study conducted

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by Aresta et al., students at one university emphasized that the school should look beyond the core competencies of each course and incorporate the development of the soft skills required to succeed in the workplace.

General education courses, as a part of a college or university's general education program, often reference soft skills among cited learning objectives. Schools across the nation increasingly recognize the importance of soft skills and implement specific targeted curriculum to help students improve. For example, Davenport University, located in Michigan, utilizes a proactive approach to ensure students graduate with the skills employers seek by embedding nine competencies within the curriculum across every program at the university. These nine competencies, referred to as the "Excellence System," serve as their general education framework (W. Sneath, personal communication, August 10, 2018). The Excellence System's nine learning competencies include global and intercultural competence, civic and social responsibility, ethical reasoning and action, critical and creative thinking, analysis and problem solving, leadership and teamwork, information and technology proficiency, written communication, and professional communication (Perkins, 2018). Beard et al. (2008) noted that Southeast Missouri State University utilizes nine objectives within their general education courses to demonstrate competency in soft skills. These competencies include the ability to locate and gather information; capabilities of critical thinking, reasoning, and analyzing skills; effective communication skills; an understanding of human experiences and the ability to relate them to the past; an understanding of human experiences and their interrelationships; the ability to integrate the breadth and depth of knowledge and experience; the ability to make informed, intelligent value decisions; the ability to make informed, sensitive aesthetic

responses; and the ability to function responsibly in one's natural, social, and political environment (p. 232).

SOFT SKILLS IN THE CURRICULUM

Some soft skills are easier to teach than others. Training and teaching systems currently exist that are designed to teach skills such as communication, teamwork, leadership, and diversity, yet other skills, such as work ethic and innovation, may be harder to teach as they are more strongly linked to a person's characteristic traits (Norton, n.d.). These skills require more than knowledge or awareness. They require demonstration through practice. Jones, Baldi, Phillips, and Waiker (2016) suggested that schools design curriculum allowing students to gain actual experience practicing and using soft skills instead of just learning about them. Likewise, Gore (2013) wrote that "education systems should shift its focus from theory to project-based learning, internships, student-driven research projects, creative alignment of education, and an authentic facility for learning" (p. 8). Adopting this type of coursework may require an overall change to the curriculum of some courses. However, according to Sigelman, Task, Resuccia, Braganza, and Bittle (2018), having the right mix of skills built into the curriculum helps graduates stand out in crowded fields, avoid underemployment, and earn a salary premium.

DISCONNECT IN PERCEPTION

There is a disconnect between the skills college graduates believe they possess and the skills that employers believe these college students possess. According to one study conducted by Hart Research Associates (2015), only 23% of employers reported recent college graduates as well prepared with the ability to apply knowledge and skills in real-world settings, and 44% of

employers rated college graduates as not prepared; the majority of employers find college

graduates unprepared in the most desired skills. Table 2 shows a comparison between the

perceptions of employers and college graduates in terms of the top skills employers expect

(Stewart et al., 2016).

Table 2: *Comparison Between Employer and College Graduate Perceptions*

SKILL	EMPLOYERS WHO FEEL COLLEGE GRADS ARE WELL PREPARED	COLLEGE GRADUATES WHO FEEL THEY ARE WELL PREPARED	DIFFERENCE IN PERCEPTION
Verbal Communication	28%	62%	34%
Teamwork	37%	64%	27%
Written Commination	27%	65%	38%
Ethical Judgment/ Decision Making	30%	62%	32%
Critical/Analytical Thinking	26%	66%	40%
Applying Knowledge & Skills to Real World	23%	59%	36%
Problem Solving	24%	59%	35%
Locating, Organizing, and Evaluation Information	29%	64%	35%
Innovation/Creativity	25%	57%	32%
Staying Current on Changing Technologies	27%	46%	19%

Acknowledging there is a gap in perception between college graduates and employers is

something higher education must acknowledge and respond to if they are to remain relevant to

the workforce. Soffel (2016) suggested the key to increasing soft skills among students is

through developing courses that focus on social and emotional learning (SEL). Soffel also

referenced a study completed by the World Economic Forum (2016b) about students who

participate in SEL and achieve 11% higher achievement scores on academic tests than those who do not participate in SEL.

PROBLEM STATEMENT

While higher education institutions traditionally focus on hard skills training, proficiency with soft skills competencies is a growing necessity. It is no longer adequate for job seekers to possess only the technical knowledge for a job. They must also focus on the non-technical skills that will increase the probability of successful employment and growth. In today's workforce, people gain employment based on hard skills but maintain a job or receive promotion as a result of their demonstration of soft skills (Cotet et al., 2017; Jacobsen-Lundeberg, 2017). Employers express frustration with what they see as a problem among college graduates who lack the necessary soft skills to be productive members of the workforce (Beard et al., 2008; Chakraborty, 2009; Murti, 2014; Soffel, 2016). Gore (2013) claimed soft skills (learning skills, innovative skills, creativity, critical thinking, problem solving, communication skills, and teamwork) "have become more important than any other skills being acquired in the previous century" (p. 7). At times, the structure of our current higher education system struggles to maintain the flexibility and nimbleness to keep up with the frequent economic and industry advancements; this includes the ability to teach students the soft skills employers now expect. Fishman and Sledge (2014) punctuated this by pointing out that "fracture lines can be seen everywhere in America's higher education system, from skyrocketing tuition costs and mounting student debt to a significant mismatch between the skills employers seek and those students possess upon graduation" (para. 14).

Rosnizza and Ngah (2015) confirmed that academic credentials are no longer the sole ticket to getting a job; these credentials must also accompany soft skills training. Rosnizza and Ngah went on to point out that "evidence from surveys suggested employers are more concerned about soft skills or attitudes rather than technical knowledge or competencies" (p. 698). This does not mean that academic skills and grades do not matter. It does, however, suggest a need to reconsider the emphasis on soft skills in the college curricula. Sigelman et al. (2018) pointed out that "the acquisition of specific workplace skills can add up to 20% to a college graduates' earnings" (p. 5); they also noted that students who major in career fields with notable underemployment rates should focus on obtaining the skills that employers most value if they hope to land a job in that field following graduation.

If industries believe that college students lack the necessary soft skills, and college students believe that they possess the required skills to be successful, there is an obvious disconnect between either what is being taught or what is being learned, and what employers seek (Stewart et al., 2016). Institutions of higher education must look for ways to embrace this challenge and develop strategies to incorporate soft skills training into their curriculum. With this increased push from employers that college graduates possess soft skills, schools must consider the question of when students will begin demanding schools provide all of the skills needed for gainful employment—not just the technical skills.

The integration of soft skills into a college curriculum increases students' chances of employment and presents opportunity for growth in future careers. Researchers, educators, and employers all agree that more needs to be done to embed soft skills into the core academic

curriculum. Tevdovska (2015) noted that university graduates, regardless of their level of expertise, are not truly ready for employment because they lack soft skill competency.

The implementation of soft skills within the system of higher education is an issue that impacts all aspects of the education-to-employment spectrum. According to the National Association of Colleges and Employers (NACE) survey of employers (NACE, 2016b), over 80% of respondents ranked communication skills, problem-solving skills, and the ability to work in teams as the top three abilities they seek in college graduates. Ritter, Small, Mortimer, and Doll (2018) pointed to a survey conducted by the Association of American Colleges and Universities (AACU), which states that 70% of employers want universities to place more attention on soft skills. Academia must respond to the demands of employers by reexamining how well the current curriculum is preparing students for the workforce (Pereira & Costa, 2017; Ritter et al., 2018; Tevdovska, 2015).

PURPOSE STATEMENT

Studies focused on the comparison between the perceptions of students to those of industry and business leaders when it comes to soft skills point out a disparity between the two entities (Stewart et al., 2016). These studies prove a difference in perceptions between what students find most important to learn and what industry and business leaders find most valuable. The primary focus of this study is a comparison of perceptions between students and faculty within a technical career field. The purpose of this study is to understand the perceptions of soft skills among students and faculty within the School of Design and Manufacturing at a regional master's-level university. First, a comparison of the overall ranking of the perceived importance of soft skills on career success among students and faculty within

the fields of design and manufacturing occurred. Second, a comparison of the perceptions between what faculty believe they incorporate into their curriculum and what students feel they learned occurred.

RESEARCH QUESTIONS

The following research questions informed this study:

1. What are the perceptions among students related to the importance of soft skills on college (academic) and career (employment) success?

2. What are the perceptions among faculty related to the importance of soft skills on college (academic) and career (employment) success?

3. How do the perceptions about the importance of soft skills on college (academic) and career (employment) success compare between students and faculty?

4. Based on student perceptions, to what extent are soft skills included in the program curriculum?

5. Based on faculty perceptions, to what extent are soft skills included in the program curriculum?

6. How do the perceptions about the extent soft skills are included in the program curriculum compare between students and faculty?

CONCEPTUAL FRAMEWORK

This study is grounded in the theory of social constructivism and constructionism. Social constructionists believe that knowledge is not an individual process, but rather it is constructed, as opposed to created, between the social interactions of multiple individuals (Doolittle, n.d.; Mills, Bonner, & Francis, 2006). In the case of this study, those individuals are represented by the students and the faculty members within the designated programs. Through the social constructivism and constructionism perspective of learning, the greatest growth of achievement is realized when learners are given complex, real-world scenarios that replicate

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work-based situations with no easy answer (Gruba & Sndergaard, 2001; Mays, 2015). This form of knowledge building is consistent with the curricular process within higher education in which knowledge is constructed through collaboration between students and faculty.

Social constructivism and constructionism emphasize the social nature of knowledge and the belief that knowledge is the result of a shared social interaction (Prawat & Floden, 1994). In a constructivist grounded theory, the researcher is positioned as the author of the reconstruction of the experience and serves to interpret the meaning of the data gathered (Mills et al., 2006). Charmaz (2000) supports this position by indicating that data do not provide a "window on reality," but rather the discovery of reality arises from the "interactive process and its temporal, cultural, and structural contexts" (p. 524).

A study by Mays (2015) illustrates the systematic application of social constructivism and constructionism within higher education to help bridge this gap between the development of job skills and the cultivation of broader competencies as a development process for both hard and soft skills. Further review of the literature suggests that constructivist learning environments and social interactions influence the intellectual and cognitive growth of students, which "deepens the learners' understanding of the knowledge base, ability to synthesize, and creative problem-solving skills" (Mays, 2015, p. 14), all of which are essential to the growth of soft skill development within learners (Gerver & Robinson, 2010; Montessori, 1912; Vygotsky, 1978). Furthermore, a social constructivism and constructionism approach aims to engage learners with purposeful learning activities designed through collaboration and reflection to enhance the knowledge base of the learner, thereby deepening individual learning and fostering creative problem solving and collaboration (Mays, 2015).

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According to May (2015), "learning activities should furthermore strive for balance between developing practical vocation-specific skills" (p. 174). Gregory and Huisman (2002) added that, in a constructivist approach, the learners reflect on their lived experiences and are then able to interpret information based on these experiences. The multidimensional engagement of learners developed through social constructivism and constructionism deepens understanding of higher-order cognitive and socioemotional skills.

SIGNIFICANCE OF THE STUDY

As employers continue to clamor for increased soft skills among college graduates, institutions of higher education will need to develop a system to ensure they provide students with the skills needed for career success. This study provides a tool schools can use to determine the alignment between the perceptions of their students and the perceptions of their faculty. The comparison of these perceptions helps ensure that courses, departments, and programs meet the needs of the students in alignment with industry-specific needs and expectations.

Many entities may benefit from this research: (a) higher education administrators concerned with meeting the demands of employers, (b) higher education faculty concerned with ensuring their courses align with the expectations of employers and students; and (c) employers who hire college graduates.

DEFINITION OF TERMS

Constructivism – students' active engagement in their own learning growth through reflection, critical analysis, involvement in purposeful learning activities, and collaborative learning (Dewey, 1997; Montessori, 1912).

Curriculum – the knowledge and skills students are expected to learn, which includes the learning standards or learning objectives they are expected to meet; the assignments and projects students must complete; and the tests, assessments, and other methods used to evaluate student learning (Curriculum, 2015).

Manufacturing Engineering Technology Program – prepares students for the development, design, analysis, planning, supervision, and construction of methods and equipment for the production of industrial and consumer goods.

Plastics Engineering Technology – provides students with knowledge of plastics processing, polymer material testing and properties, and product development.

Soft Skills – interpersonal skills associated with a person's personality, attitude, character, and ability to interact with others in a professional environment, especially as it relates to skills such as communication, teamwork, collaboration, leadership, critical thinking, problem solving, creativity, and innovation (Cotet et al., 2017; Robles, 2012; Stewart et al., 2016).

Likert Scale – a psychological measurement device used to gauge attitudes, values, and opinions (Braunsberger & Gates, 2009).

School of Design and Manufacturing – a school within the College of Engineering Technology consisting of CAD Drafting & Tool Design, Industrial Technology & Management,

Manufacturing Engineering Technology & Manufacturing Technology, Plastics Engineering

Technology, Quality Engineering Technology, Rubber Engineering Technology, and Welding

Engineering Technology.

Senior-Level Student – student currently in the final college year within a Bachelor of

Science degree program.

Welding Engineering Technology – provides students with knowledge of concept,

design, and engineering of weldments and implementation of welding processes.

ASSUMPTIONS

Based on the notion that all answers are anonymous and confidential, the researcher

assumes all participants answered the survey questions honestly and with no underlying

motives or intentions. In addition, participants understood they could withdraw from the study

at any time and with no ramifications. The researcher provided the electronic questionnaire at

the beginning of three senior-level courses and assumed the sample was representative of the

population of senior-level students within the School of Design and Manufacturing.

Additionally, the researcher assumed senior-level students experienced the most coursework

within the program curriculum.

OVERVIEW OF LITERATURE REVIEW AND THEORETICAL CONSTRUCTS

The researcher conducted a thorough review of the literature concerning soft skills

within both the educational and workplace setting. The review of literature reflects the

significance of soft skills in the workforce, an exploration of the most cited soft skills in the

related research, and the presence and expression of soft skills within the college curriculum.

OVERVIEW OF METHODOLOGY

The study is a quantitative comparative analysis of the perceptions of students and faculty within the School of Design and Manufacturing at a regional master's-level university. The researcher distributed a 14-item questionnaire to senior-level students and a 15-item questionnaire to faculty members within the programs of Manufacturing Engineering Technology, Plastics Engineering Technology, and Welding Engineering Technology. This methodological framework allowed for the comparison of survey data to describe current perceptions of students and faculty. The researcher administered the questionnaire to 104 senior-level students and 21 faculty members.

This quantitative study focused on the theoretical framework of social constructivism and constructionism of principles (Berger & Luckmann, 1991; Burr, 2003; Charmaz, 2008). Constructivism and constructionism take a position of relativism in the belief that there are no absolute truths, only the truths that a particular individual or culture happen to construct through experiences.

The study compared the similarities and differences between students and faculty in terms of their perceptions of the importance of specific soft skills, the importance of those soft skills within the frameworks of education and the workplace, and the extent soft skills were incorporated into the curriculum.

OVERVIEW OF COMPLETE STUDY

This complete study includes five chapters. The first chapter introduces the study, provides context for the reader, and outlines the research questions. The second chapter presents a concise review of related literature—the relevant scholarly work underpinning the

study—including a contextual view of both education and workforce perspectives. The third chapter presents the specific research methodology utilized, participant selection, and the data collection process. Chapter IV presents the data and findings. In Chapter V, the researcher puts forward the results and implications of findings, as well as suggestions for further research.

SUMMARY

The importance of soft skills appears in writings over the past 100 years among virtually all workforce industries (Mann & Joint Committee on Engineering Education of the National Engineering Societies, 1918; Wright, 2018). There continues to be a tremendous need for institutions of higher education to ensure they meet the demands of the current workforce. Employers and advisory boards continually note college graduates lack the soft skills necessary to be successful (Hart Research Associates, 2015; Thacker & Yost, 2002).

While many studies compare the perceptions of employers to the perceptions of students, there is little research involving the comparison of perceptions between faculty and students in regard to the importance of soft skills and to the extent they are incorporated into the curriculum. Developing a tool that allows schools to evaluatively compare the perceptions of students to the perceptions of faculty provides important data for purposes of comparative analysis. This study provides a tool to enable institutions of higher education to adequately compare the alignment of student and faculty perceptions of the importance of soft skills and a comparison of perceptions as to the extent that soft skills are incorporated into the curriculum.

CHAPTER II: REVIEW OF LITERATURE

INTRODUCTION

This chapter presents a review of the literature surrounding the perceived importance of soft skills within both the educational and workplace settings and the degree to which soft skills are currently being incorporated into the curriculum. The organization of the following review focuses on research related to the significance of soft skills in the workforce, and the presence and expression of soft skills within the college curriculum. Within the review of literature, readers will find three themes: defining the demand for soft skills, soft skills in the workforce, and soft skills in education.

DEFINING THE DEMAND FOR SOFT SKILLS

Soft skills represent the knowledge, skills, abilities, and experiences aiding employee success in the workplace. The attributes associated with soft skills are not specific to a particular industry or field of study; they apply to virtually all professional environments and workplace settings. Sigelman (2016) referred to them as "baseline skills" and noted that these skills are not specific to any particular kind of job or occupation, but rather are requested by all types of employers. He further noted that an analysis of millions of job postings revealed that one in every three skills cited in job advertisements are baseline skills (Sigelman, 2016, para. 2).

Despite focus on the importance of soft skills, employers state many employees do not possess these skills. Berger (2016) pointed to a 2016 LinkedIn survey revealing that 59% of

employers believe that it is hard to find employees who possess the soft skills required to be successful, and 58% of those employers believe that their employees' lack of soft skills limits their company's productivity. Nunn (2013) pointed to the *State of St. Louis Workforce* report, which highlighted more than 60% of the city's employers found recent applicants lacking in soft skills.

Data also suggest proficiency in soft skill areas contributes to improved opportunity for employees. According to Deming (2017), occupations requiring higher levels of soft skills grew by 11.8% between 1980 and 2012. In addition, Deming noted wages grew more rapidly for "social skill-intensive occupations" over this same time period and that social skills were a more important predictor of full-time employment (p. 5). Wentz (2012) contended that a person may be able to find a job without processing soft skills but will probably remain in low-paying jobs without advancement and increase their chances of being fired.

Soft Skills Literature

A review of literature concerned with soft skills revealed distinct themes. In attempting to synthesize the varied terminology, the researcher tallied the frequency of citation and categorized each unique theme. Table 3 depicts these themes by frequency of reference in the reviewed literature (each of which is listed in the References). Each time the researcher read an article referenced in this paper, a tally was recorded to determine overall frequency rates for each of the soft skills listed.

Table 3: *Frequency of Soft Skills Mentioned in the Literature*

SKILL	FREQUENCY
Communication Skills (verbal and written)	48
Teamwork/Collaboration	40
Critical Thinking/Problem Solving	42
Leadership	28
Creativity/Innovation	18
Ethics and Professional Morals/Values	15
Lifelong Learning	14
Flexibility /Adaptability	12
Multicultural and Diversity Understanding/Sensitivity	10
Interpersonal Skills/Relationships	10
Information Technology	9
Negotiation/Persuasion	9
Self-Motivation	8
Professionalism/Etiquette	8
Emotional Intelligence, GRIT	7
Strong/Positive Work Ethic	6
Organization	6
Analytical Skills/Process Information	5
Presentation Skills	4
Detail Orientation	4
Organizational Skills	4
Entrepreneurship Skills	4
Time Management	4
Technical Knowledge	4
Integrity	3
Positive Attitude	3
Quantitative/Numerical Reasoning	3
Responsibility	2

SKILL	FREQUENCY
Courtesy	2
Reflective Thinking Skills	1
Civic/Social Responsibility	1
Curiosity	1
Reliability	1
Conflict Management	1

Note. This table reflects the emergent themes following a review of related literature; frequencies informed determination of the top 10 skill areas included in the questionnaire (Appendix A).

Requested Soft Skills in Job Postings

Job postings are one source for determining the skills employers seek. Burning Glass Technologies (2015) conducted a study in which they analyzed nearly 25 million job postings within the United States looking for commonalities among the skills employers most commonly seek. Burning Glass looked for what they called "baseline qualifications," which are skills requested in job postings across industry and occupation, regardless of its actual requirements (p. 3). While baseline skills may not share the same definition as soft skills, they reflect common soft skill themes, such as a person's natural capabilities to work well with others or understand basic technology platforms (Burning Glass Technologies, 2019). The study revealed that one in three skills requested in job postings is a "baseline skill," Further analysis revealed communication and organizational skills are in demand in most occupations.

Defining the Top 10 Soft Skills

Based on the extensive literature review and the frequency determination (Table 3), the following 10 soft skills emerged as the most in demand (presented in ranked order). A

definition of each soft skill appears with context, as noted from research by Ngang, Yunus, and

Hashim (2015) and Shakir (2009).

1. Communication Skills (verbal and written) – The ability to convey thoughts, feelings, and emotions with clarity and confidence both in written and oral forms, and to be an active and effective listener. In this day and age, communication skills also encompass the use of technology for presentation purposes.

2. Teamwork/Collaboration – The ability to work and cooperate with people from various backgrounds in the pursuit of a common goal or objective.

3. Critical Thinking/Problem Solving – The ability to think in a critical, creative, innovative, and analytical manner by analyzing complex situations and providing an evaluation with justification.

4. Leadership – The ability to understand the role of a leader and the theories of good leadership and to serve as a leader within group settings and group projects.

5. Creativity/Innovation – Creativity and innovation are characterized by the ability to perceive the world in new ways, to make new connections between seemingly unrelated phenomena, and to generate solutions by creating new, improved, and imaginative ideas.

6. Ethics and Professional Morals/Values – The ability to analyze the ethical bounds of a situation and arrive at professionally moral interpretations through situational analysis that allows them to practice good ethics, morals, and values toward society as a whole.

7. Lifelong Learning – The ability to continue the pursuit of curiosity and knowledge through independent research and evaluation of information.

8. Multicultural and Diversity Understanding/Sensitivity – The ability to understand and appreciate the importance of inclusiveness and respect among all individuals in society regardless of race, gender, age, or any other distinguishing characteristic.

9. Flexibility/Adaptability – The ability to modify one's current thoughts, attitudes, goals, or actions to align with the current or future environment.

10. Interpersonal Skills/Relationships – The ability to effectively work well with others through appropriate behaviors and interactions such as expressing appreciation, resolving disputes, and active listening.

While there is no definitive number of the existence of soft skills, the top 10 skills

ranked by the frequency within the review of literature provide focus for this study.

Perceptions of Employers

Employers seek candidates with the ability to effectively demonstrate soft skills. They value these skills in the workplace and note candidates for employment and newly hired employees alike often lack these attributes. Chakraborty (2009) conducted a study on the perceptions of soft skills by business executives. The study found that 94% of the executives believed that soft skills were more important than domain-specific know-how (technical skills) and that 85% of the executives had positive perceptions of soft skills and wanted to incorporate soft skills training for their employees. This belief that soft skills are perhaps more important than hard skills has continued over the past decade. According to a study conducted in 2016, 71.9% of surveyed CEOs believed that soft skills are more important than hard skills for their business (Doyle, 2016). Furthermore, a LinkedIn report in 2019 found that 57% of senior leaders believed that soft skills were more important than hard skills (Cone, 2020).

A study conducted by Jones et al. (2016) asking employers to rate the importance of job-candidate characteristics at a university career fair found that most desires were associated with soft skills. Furthermore, Jones et al. concluded that universities could set themselves apart by implementing soft skills training within the curriculum. In addition, this could serve to combat the growing presence of online programs, as online institutions are not well positioned to teach soft skills given the lack of interaction among students. Adams and Morgan (2007) argued that soft skills training can happen through an e-learning environment, but that it must be context- and career-specific. They also noted the reason many early implementations of e-learning soft skills programs fail is due to a rush to implement through web-based technology.

They do also suggest that as companies continue to shift to more online interfaces and work environments, it may be important for the next generation of the workforce to adequately learn e-soft skills or how soft skills translate to web-based industries.

Global Perspective

Soft skills differ around the world. Having great communication skills in the United States, for example, generally refers to the ability to professionally communicate thoughts and ideas orally and in writing. Communication skills outside the United States may include the ability to speak more than one language. As the global economy continues to grow, workplaces become more ethnically, culturally, and racially diverse. In response, multicultural diversity takes on new meaning in educational simulations of the workplace. Stewart et al. (2016) verified this by pointing out that soft skills are important in any industry but are especially important in a global environment. A lack of soft skills is not just an issue for the United States. Countries around the world toil with the issue of how to produce more highly qualified employees. The Ministry of Education in Malaysia proclaimed, for example, that soft skills must be taught to students at all institutes of higher learning (Shakir, 2009). At Mobash University in Australia, engineering students learn soft skills through a new program called GROW that focuses on aspects of learning beyond traditional technical knowledge (Briggs, 2015). Additionally, the Singapore Management University implemented feedback from employers and made changes to its programs focused on soft skills (Briggs, 2015).

Additionally, one of the top 10 soft skills, as indicated by the review of literature frequency table (Table 3), is Multicultural and Diversity Understanding/Sensitivity. As our world becomes more interconnected, it will be essential for employees in many occupational fields to

understand cultural diversities. Multicultural and Diversity Understanding, often referred to as cultural competence, refers to a person's self-awareness and ability to appreciate different points of view, and the ability of a person to effectively collaborate with people of various cultural backgrounds (Guzman, Durden, Taylor, Guzman, & Potthoff, 2016; Redford, 2017).

SOFT SKILLS IN EDUCATION

Perception Among Students

There exists a disconnect between the perceptions of students and those of employers looking to hire students. Nunn (2013) pointed to a study that indicated that while over 90% of graduating students felt they possessed adequate soft skills, 60% of employers felt that these same students were lacking in soft skills. This study noted a difference in the perceptions of students and the expectations of employers. In a study conducted by Rosnizza and Ngah (2017), more than half of the students surveyed felt that soft skills were difficult to acquire. In this same study, students from an Engineering Technology of Welding Quality Inspection program spent 80-90% of their time in class working on hard skills and only 10-20% of their time in non-technical classes.

Jackson (2013) noted that one challenge of implementing soft skills into curriculum design is bridging the gap between learning the importance of a soft skill and the actual application of the skill. In addition, according to Opyt (2019), much like relationship building, the development of soft skills requires the learner to first understand themselves and their weaknesses and then to acknowledge and desire change and growth.

Perception Among Educators

Another rationale provided for why employees may lack soft skills is the dominance of standardized assessment. While standardized test scores positively correlate with a student's grade point average, they do not assess nonacademic or soft skills—attributes that may better predict success in life (Northwest Evaluation Association, 2018). Schooley (2017) found that the unwavering focus on test scores forced educators away from teaching soft skills to focus on the rote memorization of concepts associated with particular standardized tests. According to a report conducted by Gallup for the Northwest Evaluation Association (2018), 80% of Americans believe it is either very or extremely important for schools to help students develop interpersonal skills. Only 40% of Americans are confident standardized tests can measure these skills. As pressure mounts to improve standardized test scores, schools and the teachers within them increasingly focus on teaching the material on the assessments. This reduces emphasis on the soft skills students may be required to know to be successful in their career. In fact, the National Council of Teachers of English (2014) believes teachers could help more students develop soft skills if they were not required to focus on teaching to the test.

Incorporating Soft Skills in the Curriculum

The first step of implementing soft skills into the curriculum is to increase student awareness about the importance of soft skills (Murti, 2014). While there are many ways to teach soft skills to students, learning typically does not occur without clear course outcomes and objectives, formal evaluation, and a desire on the part of the student to learn (Bennett, 2000, as cited in Hassan & Maharoff, 2014). Before an institution of higher learning decides to implement soft skills training into the curriculum, there must be buy-in from the institution. In

addition, they must develop a strategic plan for implementation that includes a determination

of the soft skills to focus on, how the implementation will be supported, and the development

of a system to assess the soft skills being taught (Olagunju & Soenneker, 2013).

Choosing the Soft Skills to Be Taught

While there are many ways institutions can choose which soft skills to incorporate into

the curriculum, Saunders and Zuzel (2010) suggested involving employers and advisory boards

in the process of developing course design and delivery methods to ensure appropriate

implementation of career specific skills.

Framework for Incorporating Soft Skills

There are generally four possible ways to incorporate soft skills into a college

curriculum. The first option is to create a separate framework of stand-alone courses that focus

on soft skills as the primary objective (Pachauri & Yadav; 2013; Tevdovska, 2015). The benefits

of this model are that it does not require a modification of existing courses and the entire

course can focus on the soft skills themselves. There also exist limitations in this model. These

limitations include the lack of context to a particular field of work and the challenge of

transferability because of this generalization.

While many schools indicate that general education courses meet the needs of

providing the soft skills training that students need, the reality is that while general education

courses address the qualities of soft skills, they are typically not associated with specific fields

of industry. Additionally, research suggests soft skills are best developed over time and with

continued attention and spiraled practice across multiple curriculums and work-based

experiences (The Quality Assurance Commons, 2018).

The second option is to interweave soft skills training within current course content and

within programs through activities and assignments embedded within the curriculum (Pachauri

& Yadav; 2013; Tevdovska, 2015). Most experts believe incorporating soft skills training within

the curriculum provides a more realistic experience and context-specific scenarios for students

(Ngang, Chan, & Vetriveilmany, 2015). The incorporation of soft skills training into a functioning

curriculum comes with challenges. For example, college faculty have a limited timeframe to

teach the required content and may reduce current time allocations to accommodate the

incorporation of soft skills (Hassan & Maharoff, 2014; Pachauri & Yadav, 2013; Tevdovska,

2015). Additionally, Ritter et al. (2018) noted that most attempts to implement soft skills into

curriculum focus only on one course or one specific program. Few schools incorporate soft skills

at a macro level and across several disciplines.

A third potential opportunity to incorporate soft skills into the college landscape

necessitates integrating them into aspects outside of the classroom, through cocurricular and

extracurricular activities. Examples of this include interactions with tutors and counselors,

debates, competitions, cultural events, and other forms of social interaction. In this model,

students receive encouragement to attend webinars, workshops, and conferences. The decision

to implement soft skills in this way requires college-wide support. Such an implementation

would embrace many of the principles of Terry O'Banion's theory of a Learning College,

especially Principle 7, which states, "All Learning College employees identify their role in

supporting learning" (O'Banion, 1997, p. 58).

A fourth option is the incorporation of soft skills into a finishing school. The Malaysian Ministry of Higher Education implemented a "soft skill finishing school" for those students who do not meet the required standards throughout their normal educational schedule (Shakir, 2009). This finishing school, occurring in the last semester of a student's college career, provides specialized, robust individual training to help students who exhibit a lack of soft skills throughout their other classes. Ngang, Chan, and Vetriveilmany (2015) pointed out that many soft skills require development from very young age (i.e., moral and ethical decision making), and that four years is not a sufficient amount of time to effectively teach some of these skills.

Soft Skill Activities and Assignments

Adams (2013) noted that many opportunities present themselves in which students can practice soft skills, but educators do not always recognize the opportunity or have not been properly trained on how to implement soft skills. Generally speaking, soft skills cannot be learned by reading a textbook; they must be learned through real-life situations, simulations, and relationships (Murti, 2014; Stewart et al., 2016). Common forms of soft skills activities and assessment include case studies, experiential learning team projects, internship observations, project-based learning, role playing, problem-solving activities, group work, group debates, presentations, and career portfolios (Beard et al., 2008; Hanover Research, 2014; Ritter et al., 2018; Tevdovska, 2015).

Task-Based Problem-Solving Activities. Task-based problem-solving activities provide students with a task or a problem that they need to solve. At the same time, students should be encouraged to use industry-specific language, team collaboration, and creative and critical thinking to solve the issue. These types of activities require that the students apply their

knowledge to a potential career-like problem, while at the same time utilizing their soft skills to accomplish the task.

Group Work Involving Discussions and Debates. Group work involving discussions and debates provides students with the opportunity to practice their communication skills, interpersonal skills, and critical thinking skills all at the same time. By incorporating ethical issues (perhaps related to a specific industry), participants can also learn valuable skills in ethics and perhaps multicultural and diversity understanding. Rosnizza and Ngah (2017) pointed out that when students participate in properly designed group work, they acquire soft skills in areas such as teamwork, time management, adaptability, problem solving, and often presentation skills. Simply having students engage in group work is not sufficient. Group work must be implemented with intentional purpose to provide students with an opportunity to learn how to build stronger working relationships and a better understanding of their strengths and weaknesses—two attributes that will allow them to be more successful in future collaborations in college and the workplace (Pahomov, 2018). Spisak (2015) noted that success occurred when educators were specific and intentional about teaching soft skills in group work situations. Burke (2011) suggested it is important to hold students to higher expectations regarding the importance of learning soft skills during the process of working collaboratively with their peers. In each group work situation, the topics covered should be as specific as possible to the actual field of study.

Delivering Presentations. Presentation skills are important in virtually every career field. Delivering presentations within a curriculum provides students with an opportunity to present their knowledge on specific topics related to students' professional careers. Oftentimes

presentations combine both written and oral communication skills, so they can be a great way to work on multiple soft skills in one activity. Hopkins (2017) suggested that knowing how to present your ideas, in a way that is both informative and persuasive, is one of the best tools to ensure success and career advancement. Moser (2013) pointed to the Federal Institute for Vocational Education and Trainings (BIBB) prediction that negotiation and presentation skills will become increasingly important in the future workplace, yet most universities do not teach their students how to give interesting presentations that capture the attention of their audience.

Role Plays and Dialogues. Role plays and dialogues provide students with an opportunity to simulate different aspects of possible situations they may face on the job. These scenarios could include simulation of meetings, interviews, workplace discussions, as well as workplace situations that involve ethical issues and dilemmas, such as trying to resolve a conflict between two employees. These role plays require the student to implement their interpersonal skills as well as critical thinking. Kramer (2011) added that "role playing develops critical thinking and communication skills; reflective journaling exercises one's analytical thinking and writing abilities; and group work helps students to understand the value of teamwork" (para. 4).

Writing. Writing is a fundamental skill found to some level or degree in nearly all occupations. For example, Petersen (2019) pointed out that employees who have good written communication skills demonstrate respect for time, professionalism, attention to detail, intelligence, and benefit their company by ensuring quality communications both internally and with clients, prospects, and other outside interests. Cox, Ortmeier-Hooper, and Tirabassi (2009) noted that they often hear students complain about how their academic classes and the writing

that they do in English class don't seem relevant to the real world of work. They go on to state that "many students leave English language arts classrooms thinking that writing equals creative writing, literary analysis, or the five-paragraph essay, without making the connection that most people write as part of the work they do and as part of being a member of society" (p. 73).

Writing in the workplace requires skills beyond the traditional classroom assignment. In today's workplace, writers need to be rhetorically savvy, must have the ability to anticipate the needs and potential responses of their reader(s), and must be able to explain things to people who have less knowledge than they do about a topic. These skills are not traditionally taught in most required English classes. In addition, and at a bare minimum, students should be taught how to write a resume and cover letter, how to compose a professional e-mail, and how to write an official purchase request or reports. Using business-specific language and workplace structures within the classroom for activities that involve writing and require the students to implement their writing skills and communication skills will benefit students when they enter into their career.

Modeling. Proper modeling of soft skills within a school by the demonstration of specific skills by faculty, staff, and administrators can yield significant benefits for students and provides opportunities for students to see skills in action. The opportunity to watch soft skills in action and observe their successes and failures can have a tremendous impact on student ability to understand the importance of soft skills (APL nextED, 2019; Wickens & Norris, 2018). Educators and other staff members in the school should dress and act in a manner that depicts how they expect their students to act. According to Nunn (2013), the more times that instructors can

model and normalize the abilities associated with soft skills, the better the learning

environment becomes for reinforcing those skills. Nunn went on to state that while "mimicking

workplace behaviors in the classroom is an important strategy, nothing is more powerful than

the type of experiential learning where students are given well-structured opportunities for

direct interaction with employers" (para. 8).

Assessing and Evaluating Soft Skills in the Curriculum

Beard et al. (2008) found that educators pursued the need for a soft skills assessment to

respond to the calls from "professional organizations, accrediting agencies, legislators, and

others to demonstrate accountability" (p. 229). The notion and importance of soft skills is

irrefutable, yet it can often be challenging to prove that students did, in fact, learn the soft skills

they need to know. Adams (2013) pointed out that "schools have largely ignored [soft skills] in

favor of knowledge, in part because it is easier to measure academic performance" (p. 19).

Portfolios allow for summative evaluation of student work. When used for assessment,

portfolios typically refer to a collection of student work (preferably across different disciplines)

collected, organized, and presented in a reflective manner that shows growth (Hanover

Research, 2014). In addition, portfolios provide students with the opportunity to demonstrate

the skills that students have learned as well.

Internships allow for observable skill demonstration and evaluation as a finished

product of the educational institution. Sigelman et al. (2018) noted that a number of colleges

are beginning to develop programs beyond the traditional internship to ensure graduates have

the skills necessary to be job ready. To help evaluate student soft skills, schools can incorporate

a more robust internship evaluation form. Internship mentor evaluation forms should focus on

the student's technical abilities and their soft skills (Beard et al., 2008). For example, the evaluation form could include questions related to the intern's appropriate use of soft skills while on the job. In turn, faculty members can use this data to make changes to the activities they incorporate into their courses.

The development of a soft skills-specific rubric assists educators assessing soft skills in an effort to verify student preparedness. According to Arnett (2018),

> The "Excellence System" rubric grades students as introductory, reinforcing, or mastering competencies which include global and intercultural competence; civic and social responsibility, ethical reasoning and action; criterial and creative thinking; analysis and problem solving; leadership and teamwork; information and technology proficiency; written communication, and professional communication. (p. 1)

Additionally, many companies provide assessment tools to help organizations evaluate the soft skills possessed by potential hires and recruits (Kyllonen, 2013). For example, the military uses the Tailored Adaptive Personality Assessment System (TAPAS), and many colleges utilize the Personal Potential Index (PPI) to supplement the GRE for graduate school admissions (Kyllonen, 2008). While these forms of assessments may not serve the needs of higher education, it proves that an assessment tool can help measure soft skill attainment.

SUMMARY

This review of the literature presented the significance and challenges associated with incorporating soft skills into a college curriculum. While there is a strong demand from employers to increase soft skill proficiencies among college graduates, there exists a challenge in how to best achieve this goal. Additionally, there is a clear discrepancy between the perceptions of college students and the expectations of employers when it comes to soft skills.

This study provides a comparative analysis of the perceptions of students and faculty regarding the importance of soft skills within a technical career field, and the extent to which soft skills are included within the curriculum. The methodology used in the study provides a framework of descriptive comparative design essential to understanding the perceptions of senior-level students and the faculty of three programs within a School of Manufacturing and Design. Additional detail concerning the methodologic approach appears in the following chapter.

CHAPTER III: METHODOLOGY

INTRODUCTION

This chapter includes an overview of the methodology used in this quantitative study. The chapter includes a review of the purpose of the study and a discussion on the study design, including participant selection and data collection analysis. The purpose of the study was to understand the perceptions of soft skills among students and faculty within the School of Design and Manufacturing at a public Midwestern regional master's-level university. First, a comparison of the overall ranking of the importance of soft skills on career success among students and faculty within the fields of design and manufacturing took place. Second, a comparison of the perceptions between what faculty believe they incorporate into their curriculum and what students feel they learn occurred. The following research questions informed this study:

1. What are the perceptions among students related to the importance of soft skills on college (academic) and career (employment) success?

2. What are the perceptions among faculty related to the importance of soft skills on college (academic) and career (employment) success?

3. How do the perceptions about the importance of soft skills on college (academic) and career (employment) success compare among students and faculty?

4. Based on student perceptions, to what extent are soft skills included in the program curriculum?

5. Based on faculty perceptions, to what extent are soft skills included in the program curriculum?

6. How do the perceptions about the extent soft skills are included in the program curriculum compare among students and faculty?

The methodology used to investigate these questions appears in this chapter. For the benefit of the reader, this chapter includes the following sections: design of the study, selection of participants, description of programs within the School of Design and Manufacturing, data collection procedures, instrumentation, data analysis, and benefits of the study.

DESIGN OF THE STUDY

A quantitative study with a descriptive comparative design approach allowed for the comparison of survey data to be used. A descriptive comparative design attempts to describe the status of a variable or situation without the creation of a hypothesis (Center for Innovation in Research and Teaching, n.d.). This type of study focuses on an investigation and description of the differences, or lack thereof, between two or more groups but does not try to explain why the differences occur (Lodico, Spaulding, & Voegtle, 2006; McMillan & Schumacher, 2006). The data collection in a descriptive design is mostly observational in nature and aims to determine the who, what, when, where, and how associated with a research question.

Descriptive studies attempt to gather quantifiable information for use to statistically analyze a target audience or a particular subject. According to Czerny (2020), descriptive research is "a research method that describes the characteristics of the population or phenomenon that is being studied" (para. 2). It concerns finding out "what" more so than finding out the "why" to a question. Description research allows for observation and description of a research subject or problem without influencing or manipulating the conditions or variables in any way (McMillan & Schumacher, 2006).

The study followed a comparative design approach. According to Baker (2017), a comparative design study is a comparison between two or more groups in which the researcher measures the dependent variable but does not manipulate the independent variable. In this study, the two groups consisted of students and faculty within the School of Design and Manufacturing. The researcher used an online questionnaire administered to senior students and faculty within the School of Design and Manufacturing to gauge basic quantitative information related to their perceptions of soft skills. The questionnaire allowed the researcher to collect perceptions about the importance of soft skills and the degree to which they are incorporated into the curriculum. This enabled the researcher to analyze and classify the data through a meaningful and statistical approach of comparison.

SELECTION OF PARTICIPANTS

The target population of the study was senior-level students in the School of Design and Manufacturing at a regional master's-level university. The survey population was senior-level students present in six senior-level courses taught within the School of Design and Manufacturing at a regional master's college and university. Participants for this study were chosen using nonprobability purposeful sampling, which allowed the researcher to choose the survey population based on knowledge of the population and judgment of which potential subjects would provide the most complete data for analysis. Nonprobability sampling uses subjects who represent specific characteristics and are accessible for the study but does not include any type of random selection from the population (Mohsin, 2016). With purposeful sampling, the researcher selects participants based on knowledge of the population, and "a judgment is made about which subjects should be selected to provide the best information to

address the purpose of the research" (McMillan & Schumacher, 2006, p. 126). For this study, purposeful sampling occurred to select participants representing the most complete characteristics of design and manufacturing students just prior to program completion.

For the purpose of this study, sampling within the School of Design and Manufacturing occurred. According to Donnell, Aller, Alley, and Kedrowicz (2011), a large percentage of technical-specific industry leaders find that the communication and other soft skills of engineering graduates are below employer expectations. The purpose of the study was to describe the perceptions of soft skills among students and faculty. Students in technical fields such as manufacturing, welding, and engineering often appear to lack the soft skills being sought by employers (Donnell et al., 2011; Nicola, Pinto, & Mendonca, 2018; Rao, 2014). The targeted approach used in this study allowed for a focused and meaningful analysis of the data to study a specific population of students. The data allow for understanding about the perceptions of soft skills specific to the academic programs included in the study.

Study Site

The School of Design and Manufacturing exists within the College of Engineering Technology and contains three bachelor's degree programs: Manufacturing Engineering Technology, Welding Engineering Technology, and Plastics Engineering Technology. Participants selected for the student portion of the study represent one of these three programs. The researcher targeted senior-level students within these three programs based on the preponderance of evidence throughout the literature stating students in highly technical fields lack soft skills.

The total population of students in these three programs was 108, and of those, 94 students (87%) completed the survey. The students were surveyed during the fall 2019 semester (October 21–30, 2019), following summer capstone experiences. Instructors within each program provided the investigator access to communicate and administer an electronic questionnaire directly in the classroom with students. This provided the opportunity to fully address questions or concerns and obtain informed consent from all participants.

Faculty representing the same three academic programs also received an electronic questionnaire. The investigator communicated with instructors, answered questions, provided clarification, and obtained electronic consent from all participants included in the study. There is a total of 21 full-time tenure-track faculty representing these three programs, of which 13 faculty (61.9%) completed the survey for the research study. The faculty survey was conducted during the fall 2019 semester (October 24–November 11, 2019).

DESCRIPTION OF PROGRAMS WITHIN THE SCHOOL OF DESIGN AND MANUFACTURING

Manufacturing Engineering Technology

The Manufacturing Engineering Technology program offers a Bachelor of Science degree, teaching students the complexities of the entire manufacturing process, including design, analysis, planning, supervision, manufacturing methods, and the equipment used from start to finish. Students within the program learn to identify and select materials based on production requirements, work closely with computer-aided design equipment (CAD/CAM) and other state-of-the-art equipment, experience team and project learning, conduct time studies, complete cost estimates, formulate plant layout requirements, understand management

control systems, and design a total product manufacturing system. The program uses a comprehensive, multi-disciplinary approach with classes in several programs focused on hands-on training. Students also receive on-the-job experience through an internship program.

Plastics Engineering Technology

The Plastics Engineering Technology program offers a Bachelor of Science degree, teaching students through hands-on, lab-intensive classes that stress real-world knowledge in areas such as plastics processing technology, computer design for product and tooling equipment, material performance and testing using industry standards, technically related skills, and current industry trends. In addition, students must complete a 10-week internship within the plastics engineering industry.

Welding Engineering Technology

The Welding Engineering Technology program offers a Bachelor of Science degree designed to produce plant-level welding engineering technology graduates who are involved in the concept, design, and engineering of weldments and implementation of welding processes. The program encompasses welding instructional areas, including laboratories dedicated to inspection, mechanical testing, robotics, laser processing, resistance welding, and material preparation/fabrication. In addition to core welding classes, courses in material science, computer aided design, electronics, and machine tool disciplines are required and are taught by faculty specialists in those departments.

DATA COLLECTION PROCEDURES

Descriptive Quantitative Research

The research design used a quantitative descriptive non-experimental approach to help explain the current perceptions of soft skills among students and faculty within the School of Design and Manufacturing. The study did not involve the manipulation of independent variables to prove or disprove a phenomenon. The researcher completed a cross-comparative analysis using data collected from both students and members of the program faculty using an online questionnaire (Appendices A and B).

The research used QuestionPro survey building software to construct, administer, and manage data collection. The researcher met student participants in a classroom or computer lab setting traditionally used for their class during a normal class session and instructed students on how to access, complete informed consent, and participate through the online questionnaire at this location. The researcher electronically mailed faculty members from the three programs a link to the questionnaire, along with an overview of the purpose and process of the study. All full-time faculty within the School of Design and Manufacturing received the questionnaire.

INSTRUMENTATION

The research plan began with a 14-item questionnaire for students (Appendix A) and a 15-item questionnaire for faculty (Appendix B) within the School of Design and Manufacturing. The final questionnaires were then paired down to 11 questions. The questionnaires were distributed through the QuestionPro survey platform. The variables measured on the survey used a combination of nominal and ordinal data measurement scales. The majority of data

collected used an ordinal scale, based on Likert scales ranging from *very important* to *not important,* and *very likely* to *not at all*, and rank-ordered data scales that asked participants to rank the importance of soft skills ranging from 1 (being the most important of the skills listed) to 10 (being the least important of the skills listed).

According to Carroll (n.d.), instrument validity refers to the extent to which the instrument measures what it is intended to measure. One of the methods used to ensure validity was to provide all of the participants with the same definition of the term *soft skills* within the questionnaire (Appendices A and B). Another attempt to improve validity was to pilot the survey questions with a sample population to provide an opportunity to modify the questions as needed. According to McMillan and Schumacker (2006), pilots are to be conducted with a sample of subjects that share similar characteristics to those that will be used in the study. The pilot survey for this study included 42 senior-level students and six full-time tenure-track faculty within the Automotive Engineering Technology program (located within the College of Engineering Technology) to ensure any issues could be corrected prior to the final survey being released.

Ethical Considerations

McMillan and Schumacher (2006) identify 10 guiding principles for ethical research:

1. The primary investigator of the study is responsible for the ethical standards to which the study adheres

2. The investigator should inform the subjects of all aspects of the research

3. The investigator should be as open and honest with the subjects as possible

4. Subjects must be protected from physical and mental discomfort, harm, and danger

5. Many studies require the investigator to secure informed consent from the subjects before they participate in the research

6. Information obtained about the subjects must be held confidential

7. For research conducted through an institution, such as a university or school system, approval for conducting the research should be obtained from the institution before any data are collected

8. The investigator has a responsibility to consider potential misinterpretations and misuse of the research

9. The investigator has the responsibility of recognizing when potential benefits have been withheld from a control group

10. The investigator should provide subjects with the opportunity to receive the results of the study in which they are participating. (pp. 143-144)

Principally, the researcher ensured participants knew the purpose of the study, understood participation was voluntary, and were aware discontinuation of participation at any time was possible without consequence. Further, the researcher limited and communicated potential risks and benefits of participation and stored data securely. In addition, approval to conduct this study occurred through the Institutional Review Board (IRB) at Ferris State University in Big Rapids, Michigan (Appendix C).

Informed Consent

Informed consent ensures that participants received information about the procedures and risks of the study, understand that their participation is voluntary, and understand that they can withdraw from the study at any point without repercussion (Lodico et al., 2006; McMillan & Schumacher, 2006). For surveys conducted online, it is common practice to use a consent paragraph at the beginning of the survey as opposed to a signed consent form as long as the participants are given the same type of information about the study (purpose, risks,

benefits, completely voluntary, confidentiality, etc.) as participants who would physically sign a consent form (University of Massachusetts Amherst, 2019).

Because of the online administration of the survey, the informed consent appeared as the first page of the survey and required the participant to check a box affirming consent in order to proceed (Appendices A and B).

Data Security

All data collected through the study were maintained and secured either through an electronic data storage device/software or in a locked drawer within the researcher's locked office. While no personal identification information was collected from the survey, all data analysis was conducted on a university laptop computer with disk encryption. All paper-based data (notes, charts, etc.) were stored in a locked drawer in the researcher's locked office.

DATA ANALYSIS

The research design involved a quantitative, descriptive, non-experimental study. The projected outcomes of the data focused on gauging the perceptions of students and faculty in relationship to the importance of soft skills and to what level participants believed soft skills have been incorporated into the curriculum within the School of Design and Manufacturing at a public Midwestern regional master's-level university. The researched phenomenon did not involve the manipulation of independent variables or conditions, nor did it require the development of a hypothesis.

Delimitations

The study is delimited to three programs within the School of Design and Manufacturing, which is part of the College of Engineering Technology at a public Midwestern, regional master's-level university. The information from this study may be of use to other programs at similar colleges and universities and to the colleges of the study institution. Additionally, it is possible for a similar study to be conducted within programs and schools of higher education across the country to begin painting a broader picture of soft skill perceptions on a national level.

Limitations

This research and analysis used data gathered from an online survey given to a specific population of students and faculty. While this research may be important to the School of Design and Manufacturing, the College of Engineering Technology, and the public Midwestern regional master's-level university, the results of this study are not generalizable to other programs, schools, or universities. This research could inform other institutions of higher education as they continue to produce students who meet the needs of the workforce competing in a global economy.

Another limitation of this study is the non-random purposeful sampling used for the research. This sampling approach limits the study's generalizability. While limiting the generalizability of the study to other populations, the sampling approach does allow for greater duplication to other specific schools or programs within a college or university.

BENEFITS OF THE STUDY

Benefit to Students

       The students within the School of Design and Manufacturing may benefit from this study by exposure to the study. Through exposure to this study, students gained experience with an aspect of academic research, may have new awareness of soft skills, and may realize increased awareness of key concepts associated with soft skills. In addition, students became aware of the soft skills employers seek.

Benefit to Program

       The School of Design and Manufacturing may benefit from this study in the form of statistical data to analyze potential curricular gaps. In addition, the school may better understand the perceptions of students in regard to their level of knowledge and perceived importance of soft skills.

Benefit to the University

       The university may benefit from this study by creating a focused effort to analyze both student and faculty perceptions within different programs and to potentially develop strategies to evaluate these perceptions regarding the importance of soft skills and the implementation of soft skills within the curriculum. Additionally, the university may use the study to begin to increase dialog about soft skills and the curriculum process as a whole.

Benefit to Employers

       The study benefits employers. Specifically, the data will allow employers to gain an understanding of the perceptions of students graduating from the School of Design and

Manufacturing. In addition, the study provides employers with data regarding the types of soft skills currently being implemented into the program curriculum. Employers can then use the data to determine if the inclusion of soft skills-based curriculum is in line with their needs.

SUMMARY

This chapter outlined the rationale for selecting a descriptive comparative quantitative research design to collect data on the perceptions of soft skills from both students and faculty within the School of Design and Manufacturing. In addition, this chapter discussed why the researcher chose to use a nonprobability purposeful sampling approach to select participants for the study and presented an overview of data collection, analysis, and storage for ethical and security purposes.

The next chapter presents data collected and analyzed in the study. The researcher will provide a contextualized summary of findings along with details of the statistical treatments.

CHAPTER IV: PRESENTATION OF DATA

INTRODUCTION

The purpose of this quantitative study was to evaluate the perceptions of soft skills among the faculty and senior-level students within the School of Design and Manufacturing. When presented, these data reflect the perceived importance of soft skills among faculty and students. In addition, the research assesses the extent to which soft skills appear in the college curriculum within the three programs (Manufacturing Engineering Technology, Plastics Engineering Technology, and Welding Engineering Technology) within the School of Design and Manufacturing at a regional master's-level university.

The research questions addressed in this study were:

1. What are the perceptions among students related to the importance of soft skills on college (academic) and career (employment) success?

2. What are the perceptions among faculty related to the importance of soft skills on college (academic) and career (employment) success?

3. How do the perceptions about the importance of soft skills on college (academic) and career (employment) success compare among students and faculty?

4. Based on student perceptions, to what extent are soft skills included in the program curriculum?

5. Based on faculty perceptions, to what extent are soft skills included in the program curriculum?

6. How do the perceptions about the extent soft skills are included in the program curriculum compare among students and faculty?

Electronic responses from participants collected online through QuestionPro, a survey software, appear in this chapter. The information collected regarding each question in the questionnaire appears as expressed by participant responders. See Appendix A (student survey) and Appendix B (faculty survey) for the survey instrument.

CONTRIBUTIONS OF THE PILOT STUDY

The researcher conducted a pilot approximately 6 weeks prior to the formal study. The pilot study tested the process of delivery and implementation of the questionnaires and the overall methodology for the study. This pilot helped to ensure the reliability and validity of the questionnaire. In addition, the pilot confirmed that the questionnaire solicited the data that were needed to complete the study. The sample pool of the pilot study consisted of senior-level students and faculty within the Automotive Engineering program. The vocational similarity between the Automotive Engineering program and programs used for the study allowed for a comparative analysis.

In total, 42 students and 5 faculty members received an invitation to complete the pilot through an online questionnaire pertaining to their perceptions of soft skills. The researcher remained in the computer lab during the time of the student survey and presented information on implied consent, an overview of the purpose of the research, and the survey. In addition, the researcher answered questions related to the research. The delivery method for the faculty survey used the university electronic mail system.

Participants had the opportunity to offer feedback either in person (student survey) or through email (faculty survey). However, the participants did not provide any feedback on adjustments they deemed necessary to the questionnaire. One faculty participant provided

support for the research through an informal conversation. The researcher sought additional feedback regarding possible adjustments to the survey and the questionnaires from the participants but was not provided any recommendations for change. Following the opportunity for feedback, the researcher finalized instrumentation without change to the questionnaires.

SURVEY RESPONSES

The total population of students in the three programs was 108, and of those, 94 students (87%) completed the questionnaire in its entirety (Table 4). The student survey occurred during the fall 2019 semester (October 21–30, 2019), following summer internship experiences. The total population of faculty in the three programs was 21, and of those, 13 faculty (61.9%) completed the questionnaire in its entirety. The faculty survey occurred during the fall 2019 semester (October 24–November 11, 2019).

Table 4: *Survey Participants by Program*

PARTICIPANT PROGRAM (STUDENT ROSTER TOTAL)	STUDENTS	FACULTY
Manufacturing Engineering Technology (21)	12 (12.77%)	6 (46.15%)
Plastics Engineering Technology (45)	41 (43.62%)	3 (23.08%
Welding Engineering Technology (42)	41 (43.62%)	4 (30.77%)
Total	94 (100%)	13 (100%)

There are no participant demographic data provided for this study. All student participants were senior-level students (students in their senior year of coursework) within the School of Design and Manufacturing at a regional master's-level university. All faculty members represent individuals currently teaching within the School of Design and Manufacturing at a regional master's college and university.

RESULTS

The survey consisted of a quantitative questionnaire in which the variables measured on the survey used a combination of nominal and ordinal data measurement scales. The majority of data collected used an ordinal scale, based on Likert scales (ranges of 3 and 5), ranging from *very important* to *not important*, and *very likely* to *not at all likely*. Ordered data scales asked participants to rank the importance of soft skills ranging from 1 (being the most important of the skills listed) to 10 (being the least important of the skills listed). The information collected appears in the following sections in both summary and table format.

PARTICIPANT SURVEY RESPONSES

The first two questions on the survey referred to the informed consent and the definition of soft skills, respectively. Participants were unable to continue with the survey if they chose "no" to either question. Of the 100 students who began the questionnaire, 99 (99%) answered "yes" to the informed consent question and continued the questionnaire. Of the 99 students who moved on to question 2, 98 (98.99%) answered "yes" in agreement with the definition of soft skills and proceeded to the next question in the questionnaire. Between questions 2 and 3, four student participants discontinued participation; 94 students completed the entire questionnaire. Of the 16 faculty who began the questionnaire, all 16 (100%) answered "yes" to the informed consent question and continued on with the questionnaire. Of the 16 faculty who moved on to question 2, all 16 (100%) answered "yes" in agreement with the definition of soft skills and proceeded to the next question in the questionnaire. Between questions 2 and 3, three faculty participants discontinued participation. The remaining 13

faculty completed the questionnaire. The data below represent the participants who answered "yes" to the first two questions and completed the entire questionnaire.

The third question on the survey asked participants to rank the importance of 10 soft skills (Table 5). Both students and faculty ranked "Critical Thinking/Problem Solving" as the most important skill, Teamwork/Collaboration as the third most important skill, Flexibility/Adaptability as the fifth most important skill, and Multicultural and Diversity Understanding/Sensitivity as the least important skill. The ranking of the remaining skills did not generate equal rankings between the students and the faculty.

Table 5: *Participant Ranking of the Importance of Soft Skills (Survey Question 3)*

OVERALL RANKING (1 BEING MOST IMPORTANT)	SOFT SKILL	STUDENT (AVG. RANK)	SOFT SKILL	FACULTY (AVG. RANK)
1	Critical Thinking/Problem Solving	2.97	Critical Thinking/Problem Solving	2.69
2	Verbal Communication Skills	4.32	Ethics/Professional Morals	3.38
3	Teamwork/Collaboration	4.45	Teamwork/Collaboration	4.00
4	Ethics/Professional Morals	4.46	Verbal Communication Skills	4.62
5	Flexibility/Adaptability	5.19	Flexibility/Adaptability	5.54
6	Leadership	5.69	Written Communication Skills	5.77
7	Creativity/Innovation	5.84	Leadership	6.15
8	Lifelong Learning	6.57	Creativity/Innovation	6.77
9	Written Communication Skills	6.94	Lifelong Learning	7.38
10	Multicultural and Diversity Understanding/Sensitivity	8.57	Multicultural and Diversity Understanding/Sensitivity	8.69

A comparative analysis occurred between the overall ranking of importance (question 3) and the percentage of students who believed that they had learned the particular skill throughout the program (question 20) (Table 6).

Table 6: *Comparative Analysis of Ranked Soft Skill Importance to Percent of Students Who Believe Particular Skills Are Taught in Courses/Program*

RANK (1 BEING MOST IMPORTANT)	SKILL	BELIEVE IT WAS TAUGHT IN A CLASS/PROGRAM
1	Critical Thinking/Problem Solving	93%
2	Verbal Communication Skills	85%
3	Teamwork/Collaboration	90%
4	Ethics/Professional Morals	63%
5	Flexibility/Adaptability	77%
6	Leadership	67%
7	Creativity/Innovation	71%
8	Lifelong Learning	64%
9	Written Communication Skills	89%
10	Multicultural and Diversity Understanding/Sensitivity	31%

A comparative analysis occurred between the faculty respondents' overall ranking of the importance of each soft skill (question 3) and the percentage of faculty who reported they taught the particular skill throughout the program (question 20). These data represent a cross-question analysis between perceived importance and actuality of implementation into the curriculum (Table 7).

Table 7: *Comparative Analysis of Ranked Soft Skill Importance to Percent of Faculty Who Believe They Teach Particular Skills in Courses/Program*

RANK	SKILL	BELIEVE THEY TAUGHT IN A CLASS/PROGRAM
1	Critical Thinking/Problem Solving	92%
2	Ethics/Professional Morals	62%
3	Teamwork/Collaboration	92%
4	Verbal Communication Skills	77%
5	Flexibility/Adaptability	62%
6	Written Communication Skills	92%
7	Leadership	54%
8	Creativity/Innovation	62%
9	Lifelong Learning	46%
10	Multicultural and Diversity Understanding/Sensitivity	15%

A final comparison reflects student and faculty responses to the belief that particular soft skills were taught within the courses/program. For this comparison, the researcher removed the importance rank, and the soft skills appear in alphabetical order (Table 8). Data reflect the comparison between student and faculty perceptions. Other than the categories of Teamwork/Collaboration and Written Communication, the data reflect that students generally reported soft skills were being taught at a higher level than faculty reported teaching them.

Table 8: *Comparison Between Student and Faculty Perceptions of Soft Skills Being Taught in the Courses/Program*

SOFT SKILL	STUDENT	FACULTY
Creativity/Innovation	71%	62%
Critical Thinking/Problem Solving	93%	92%

SOFT SKILL	STUDENT	FACULTY
Ethics/Professional Morals	63%	62%
Flexibility/Adaptability	77%	62%
Leadership	67%	54%
Lifelong Learning	64%	46%
Multicultural and Diversity Understanding/Sensitivity	31%	15%
Teamwork/Collaboration	90%	92%
Verbal Communication Skills	85%	77%
Written Communication Skills	89%	92%

The following data appear in both textual and graph form. Below is both a textual and graphical representation of responses to each question within the questionnaire. A textual analysis of the graphical representation appears before each graph.

Survey Question 4

Based on your understanding of soft skills, to what extent do you believe they are important to be successful in your (a student's) education program?

When asked, students and faculty described their belief on the importance of soft skills in their educational program (Figure 1). A total of 69% of students and 69% of faculty reported softs skills are either important or very important to a student's educational success. All faculty (100%) reported soft skills were at least moderately important to a student's educational success. Finally, 11% of students felt soft skills were only slightly important or not important at all to their educational success.
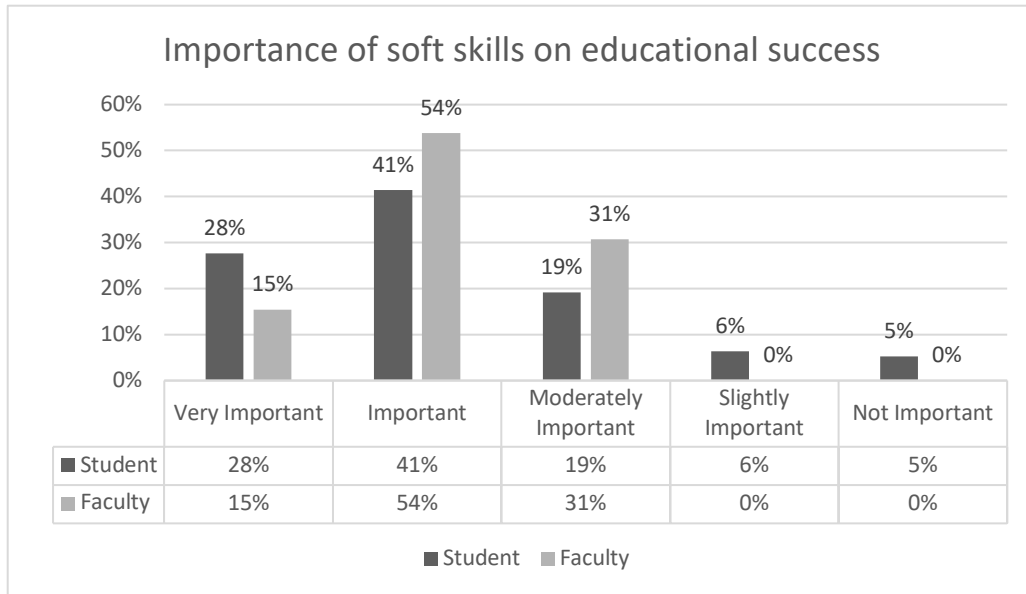
Figure 1. Participant responses to survey question 4.

Survey Question 5

Based on your understanding of soft skills, to what extent do you believe they are

important to be successful in your (a student's) career?

When asked to describe their beliefs on the importance of soft skills on a student's

career success, 90% of students and 100% of faculty reported soft skills either important or very

important to a student's career success (Figure 2). Only 3% of student participants reported soft

skills as only moderately important, slightly important, and not important at all.

Figure 2. Participant responses to survey question 5.

Survey Question 6

To what extent do you believe mastery of soft skills contributes to learning

course/program outcomes?

Students and faculty described their belief about the extent to which the mastery of soft

skills contributed to learning course and program outcomes. Forty-six of the 96 student

participants (48%) stated they believed it was very likely that a student's mastery of soft skills

contributed to learning course/program outcomes, 49% stated that the mastery of soft skills

somewhat contributed to learning course/program outcomes, and 3% stated that the mastery

of soft skills did not contribute to the learning of course/program outcomes (Figure 3). Of the

13 faculty members who completed the survey, 3 (23%) stated they believed it was very likely

that a student's mastery of soft skills contributed to learning course/program outcomes, 8

(62%) stated that the mastery of soft skills somewhat contributed to learning course/program

outcomes, and 2 (15%) stated that the mastery of soft skills did not contribute to the learning

of course/program outcomes (Figure 3).

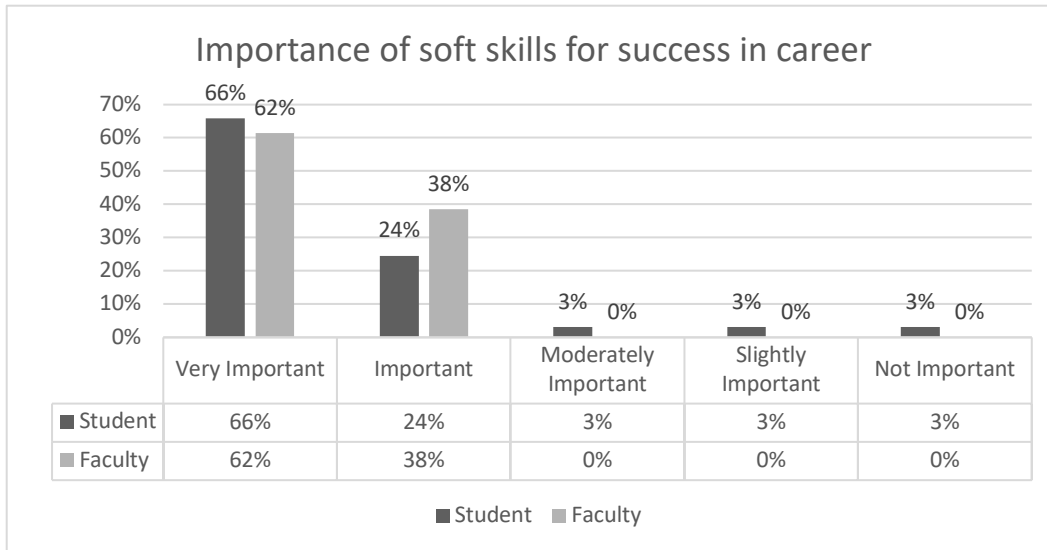*Figure 3. Participant responses to survey question 6.*

Survey Question 7

To what extent do you believe mastery of soft skills contributes to achieving higher

grades?

Students and faculty reported their belief about the extent to which the mastery of soft

skills contributed to achieving higher grades. In total, 94% of students and 92% of faculty

reported that they believe the mastery of soft skills contributes to students achieving higher

grades. In addition, 6% of students and 8% of faculty reported that the mastery of soft skills did

not contribute to students achieving higher grades (Figure 4).

Figure 4. Participant responses to survey question 7.

Survey Question 8

To what extent do you believe mastery of soft skills contributes to landing an internship?

Students and faculty indicated their belief about the extent to which the mastery of soft skills contributes to securing an internship. In total, 99% of students and 100% of faculty indicated that the mastery of soft skills contributes to students obtaining an internship (Figure 5). Only, 1% of students reported that the mastery of soft skills did not contribute to students obtaining an internship (Figure 5).

To what extent do you believe mastery of soft skills contributes to landing an internship?

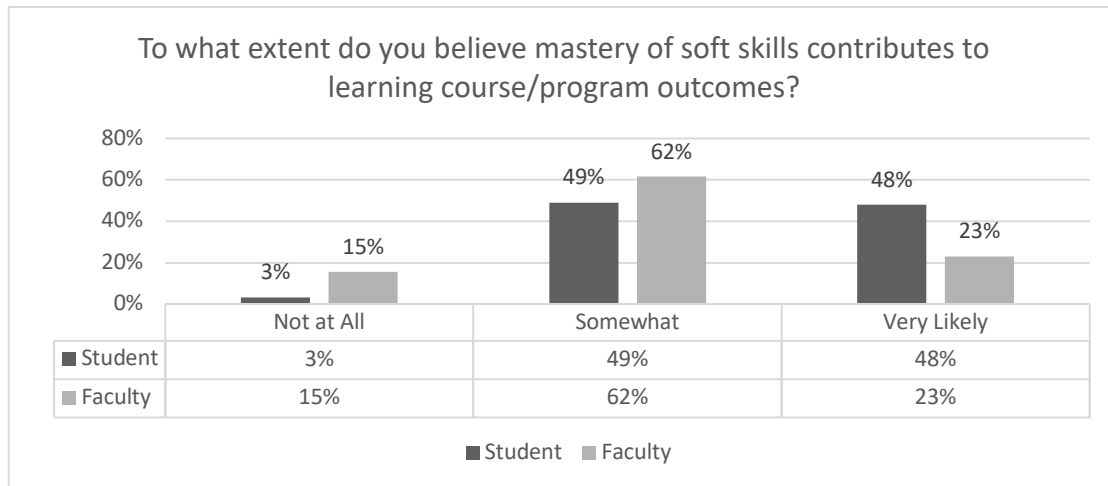|	Not at All	Somewhat	Very Likely
Student	1%	20%	79%
Faculty	0%	31%	69%
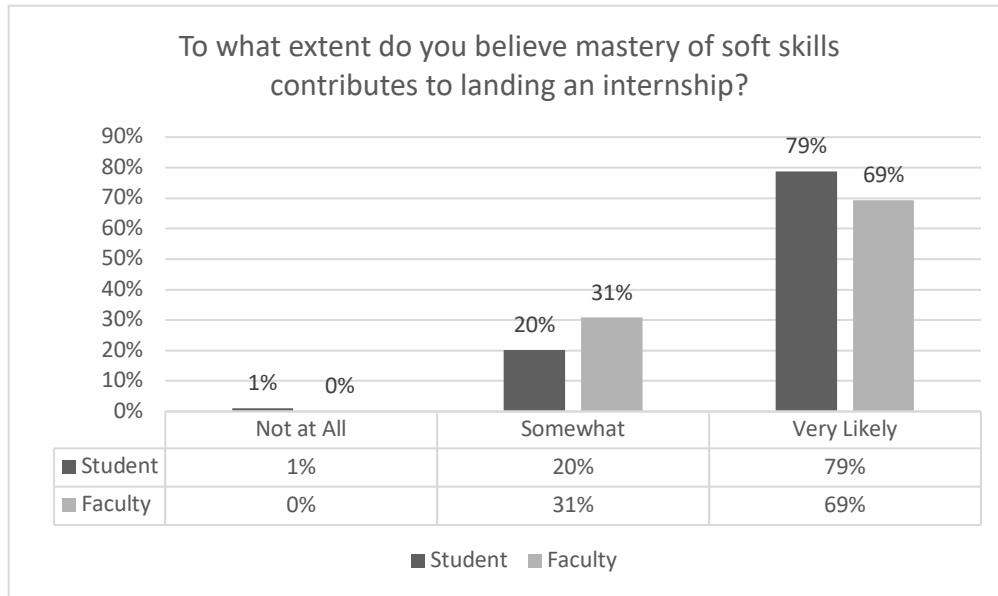
Figure 5. Participant responses to survey question 8.

Survey Question 9

To what extent do you believe mastery of soft skills contributes to securing a job?

Students and faculty reported their belief about the extent to which the mastery of soft skills contributes to securing a job. In total, 100% of students and 100% of faculty indicated that the mastery of soft skills contributes to students securing a job (Figure 6). In addition, 6% of students and 8% of faculty do not believe that the mastery of soft skills contributes to students securing a job.
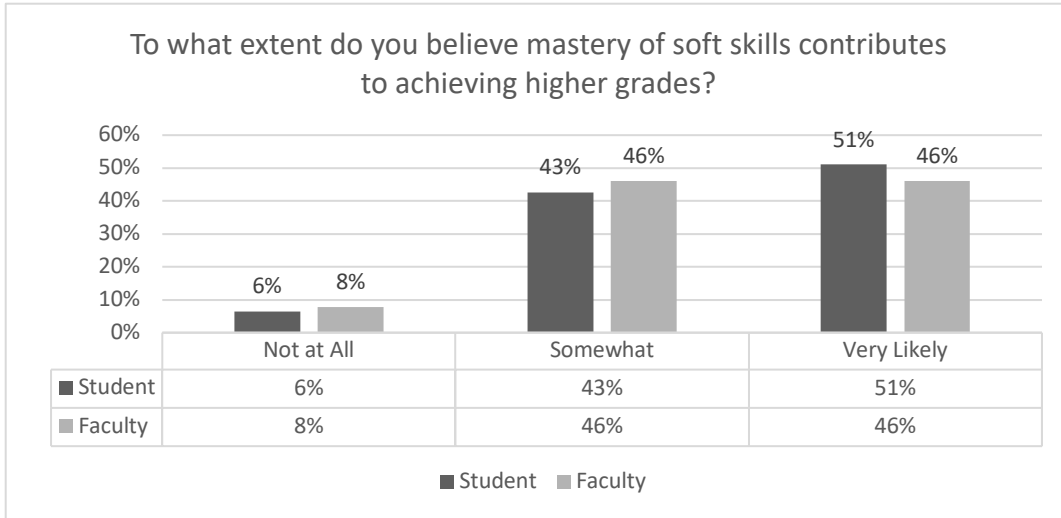
Figure 6. Participant responses to survey question 9.

Survey Question 10

To what extent do you believe mastery of soft skills contributes to earning a higher

salary?

Students and faculty indicated their belief about the extent to which the mastery of soft

skills contributes to earning a higher salary. In total, 98% of students and 100% of faculty

reported the mastery of soft skills contributes to students achieving a higher salary (Figure 7).

To what extent do you believe mastery of soft skills contributes to earning a higher salary?

|	Not at All	Somewhat	Very Likely
■ Student	1%	24%	74%
■ Faculty	0%	38%	62%
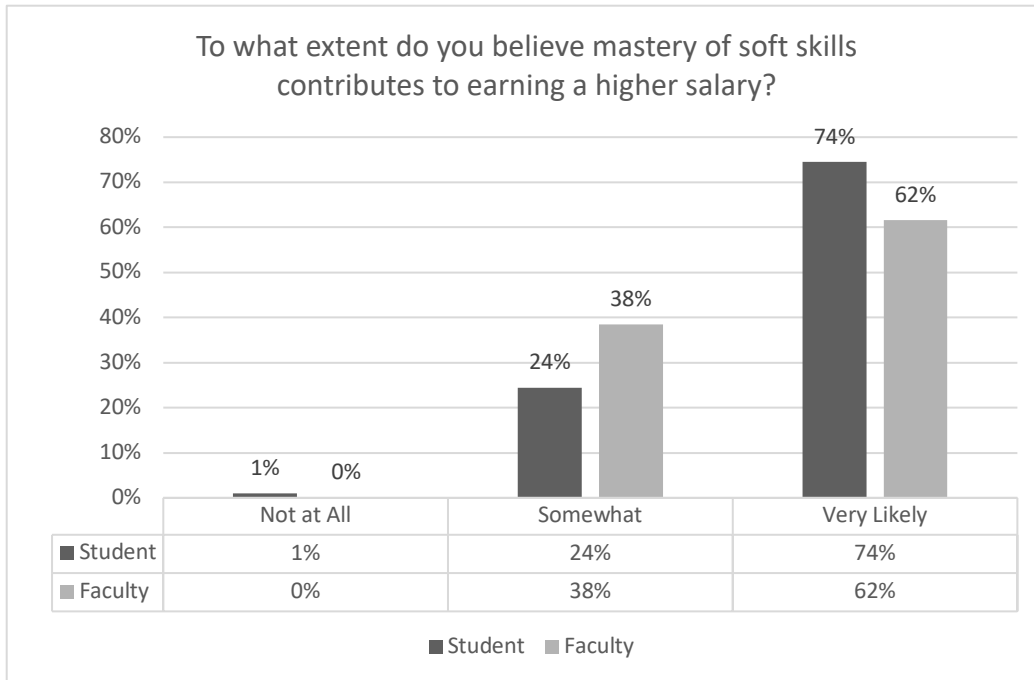
■ Student ■ Faculty

Figure 7. Participant responses to survey question 10.

Survey Question 11

To what extent do you believe mastery of soft skills contributes to maintaining

employment?

Students and faculty indicated their belief about the extent to which the mastery of soft

skills contributes to maintaining employment. In total, 98% of students and 100% of faculty

reported the mastery of soft skills contributes to students' ability to maintain employment

(Figure 8). Only 2% of students reported that they do not believe that the mastery of soft skills

contributes to students maintaining employment.

To what extent do you believe mastery of soft skills contributes to maintaining employment?

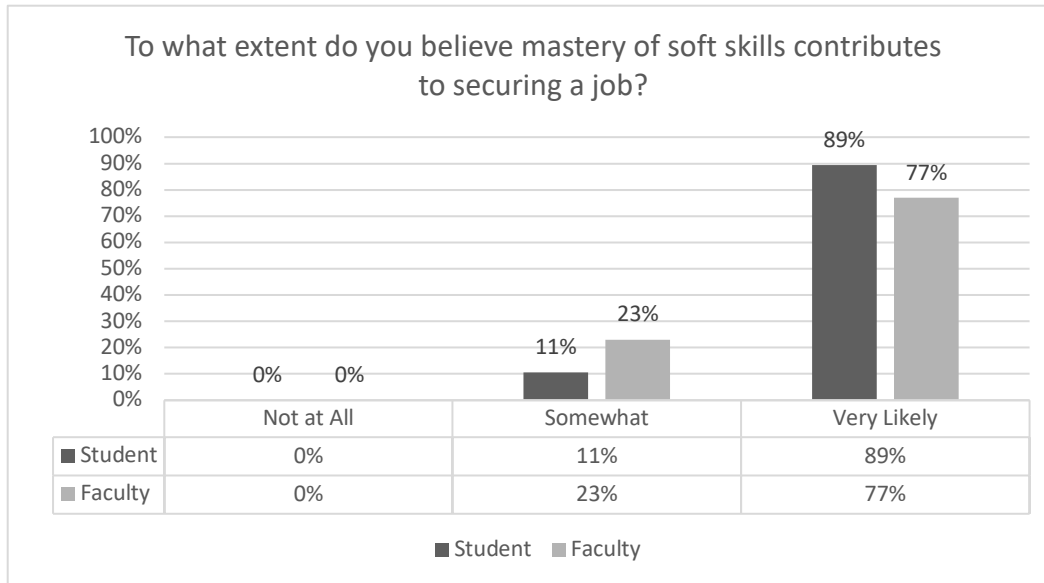|	Not at All	Somewhat	Very Likely
■ Student	2%	32%	66%
■ Faculty	0%	38%	62%

Figure 8. Participant responses to survey question 11.

Survey Question 12

To what extent do you believe mastery of soft skills contributes to gaining advancement or promotion?

Students and faculty indicated their belief about the extent to which the mastery of soft skills contributes to gaining advancement or promotion. In total, 100% of students and 100% of faculty reported the mastery of soft skills contributes to advancement or promotion (Figure 9). Of these respondents, 85% of the students indicated that the mastery of soft skills was very likely to contribute to gaining advancement or promotion.

To what extent do you believe mastery of soft skills contributes to gaining advancement or promotion?

|	Not at All	Somewhat	Very Likely
■ Student	0%	15%	85%
■ Faculty	0%	31%	69%
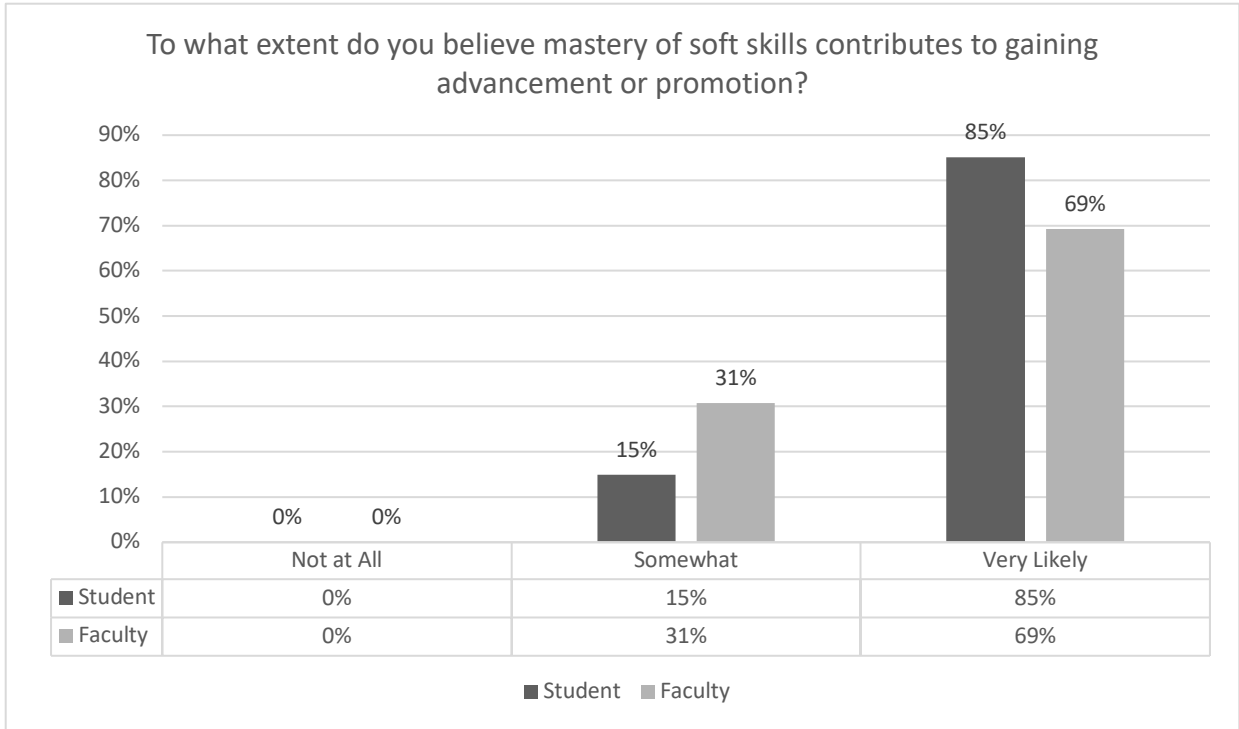
■ Student ■ Faculty

Figure 9. Participant responses to survey question 12.

Survey Question 13

To what extent do you believe mastery of soft skills contributes to better relationships

with co-workers?

Students and faculty indicated their belief about the extent to which the mastery of soft

skills contributes to better relationships with co-workers. In total, 100% of students and 100%

of faculty reported the mastery of soft skills contributes to better relationships with co-workers

(Figure 10). Of these respondents, 86% of the students indicated that the mastery of soft skills

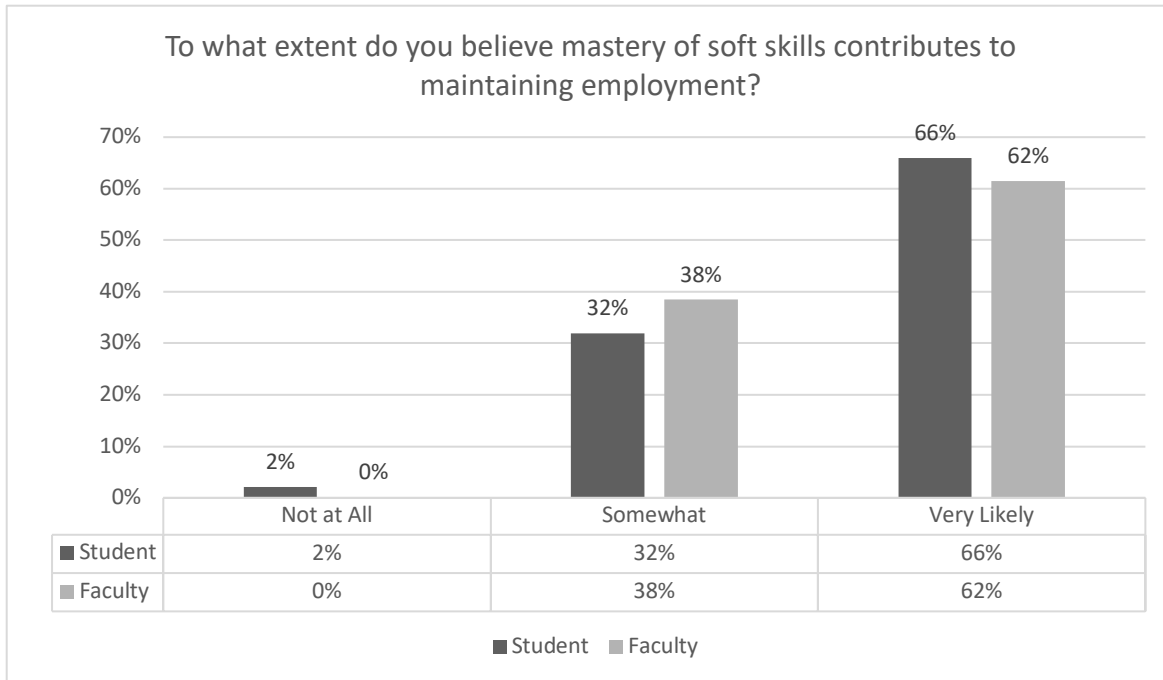was very likely to contribute to better relationships with co-workers.
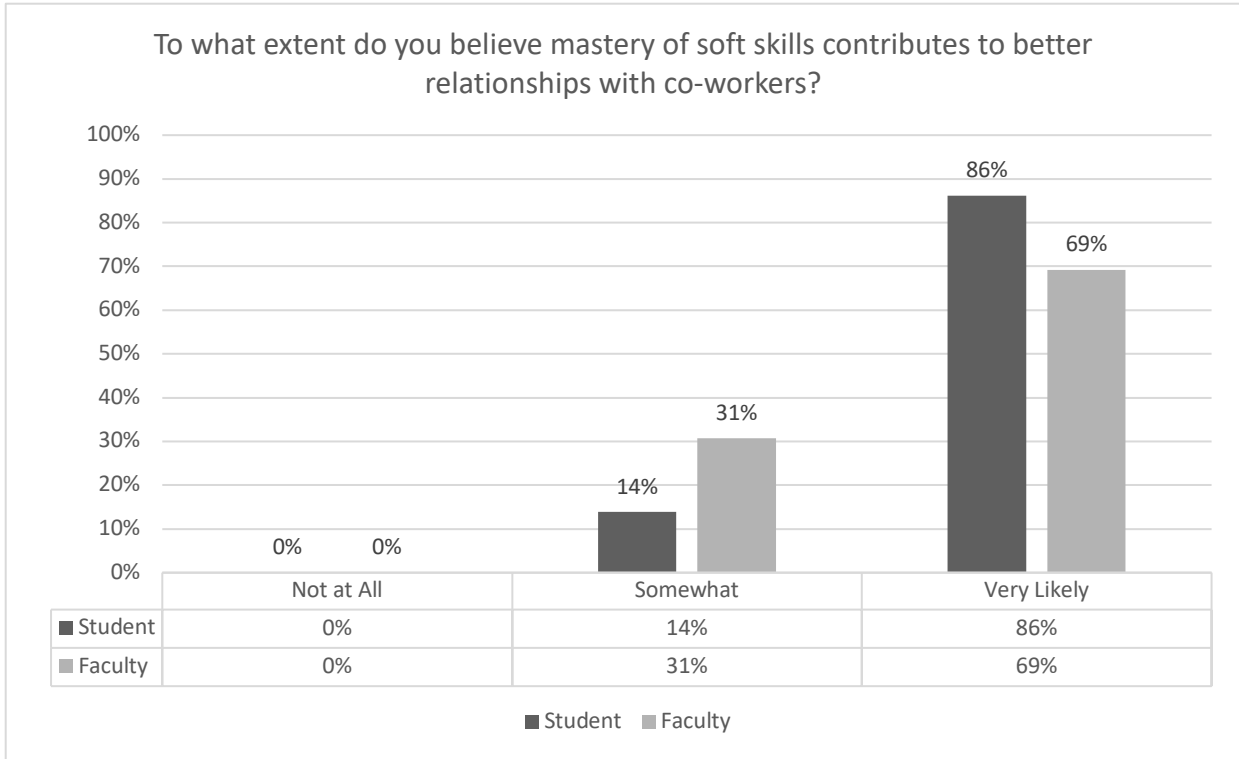
Figure 10. Participant responses to survey question 13.

Survey Question 14

To what extent do you believe mastery of soft skills contributes to being more productive

at work?

Students and faculty indicated their belief about the extent to which the mastery of soft

skills contributes to being more productive at work. In total, 95% of students and 100% of

faculty reported the mastery of soft skills contributes to being more productive at work (Figure

11). Only 5% of students reported that they do not believe that the mastery of soft skills

contributes to being more productive at work.
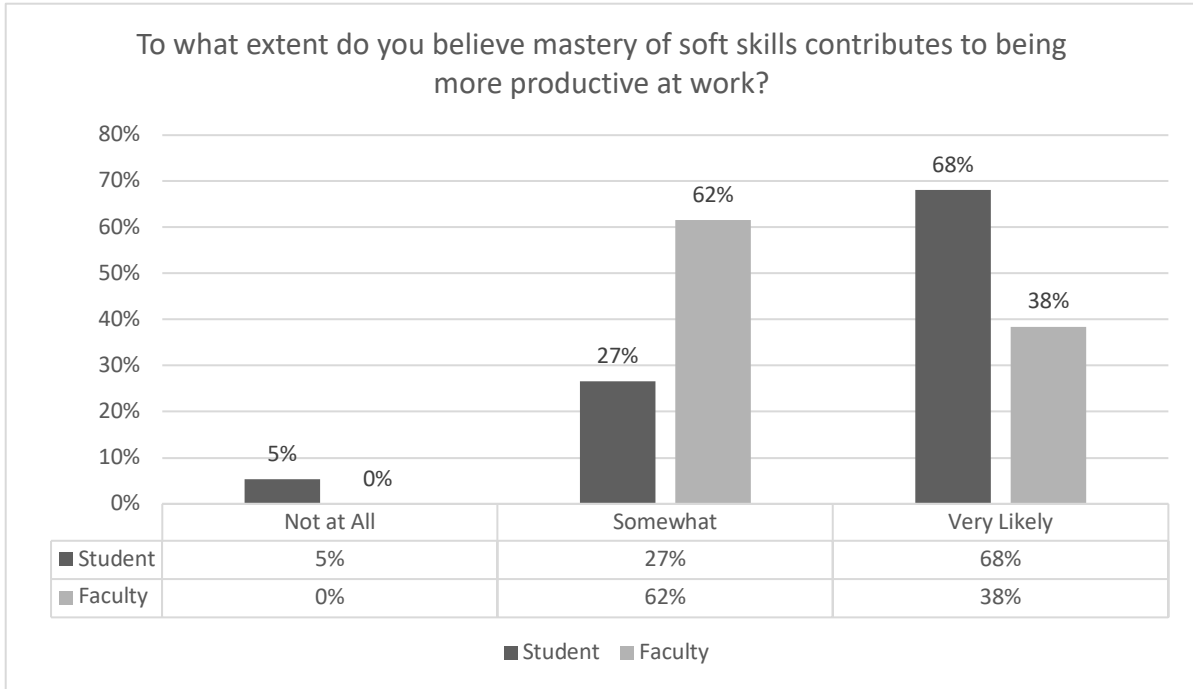
Figure 11. Participant responses to survey question 14.

Survey Question 15

To what extent do you believe that the faculty within the School of Design and

Manufacturing discussed the value of soft skills?

Students and faculty indicated the extent to which they believe the faculty within the

School of Design and Manufacturing discuss the value of soft skills with students. In total, 86%

of students and 92% of faculty reported the faculty within the School of Design and

Manufacturing discuss the value of soft skills with students (Figure 12). In addition, 14% of

students and 8% of faculty do not believe that the faculty within the School of Design and

Manufacturing discuss the value of soft skills with students.

To what extent do you believe that the faculty within the School of Design and Manufacturing discuss the value of soft skills with students?

	Not at All	Somewhat	Very Likely
Student	14%	60%	26%
Faculty	8%	54%	38%

Figure 12. Participant responses to survey question 15.

Survey Question 16

To what extent do you believe that the faculty within the School of Design and

Manufacturing taught (teach) soft skills throughout the curriculum?

Students and faculty indicated the extent to which they believe the faculty within the

School of Design and Manufacturing taught (teach) soft skills throughout the curriculum. In

total, 92% of students and 92% of faculty reported the faculty within the School of Design and

Manufacturing taught (teach) soft skills throughout the curriculum (Figure 13). In addition, 8%

of students and 8% of faculty do not believe that the faculty within the School of Design and

Manufacturing taught (teach) soft skills throughout the curriculum.

To what extent do you believe that the faculty within the School of Design and Manufacturing taught soft skills throughout the curriculum?

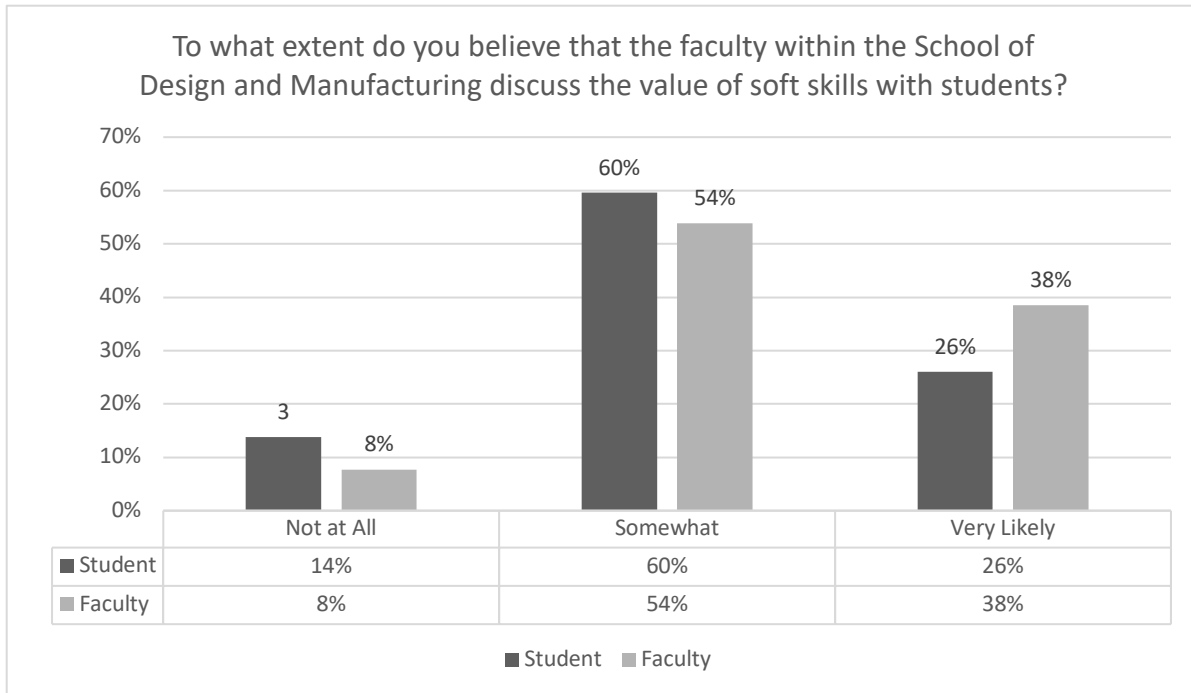|	Not at All	Somewhat	Very Likely
Student	8%	61%	31%
Faculty	8%	46%	46%

Figure 13. Participant responses to survey question 16.

Survey Question 17

To what extent do you believe that the faculty within the School of Design and Manufacturing reinforced soft skills through career-focused activities (resume writing, interview preparation, etc.)?

Students and faculty indicated the extent to which they believe the faculty within the School of Design and Manufacturing reinforced soft skills through career-focused activities. In total, 98% of students and 92% of faculty reported the faculty within the School of Design and Manufacturing reinforced soft skills through career-focused activities (Figure 14). In addition, 2% of students and 8% of faculty do not believe that the faculty within the School of Design and Manufacturing reinforced soft skills through career-focused activities.
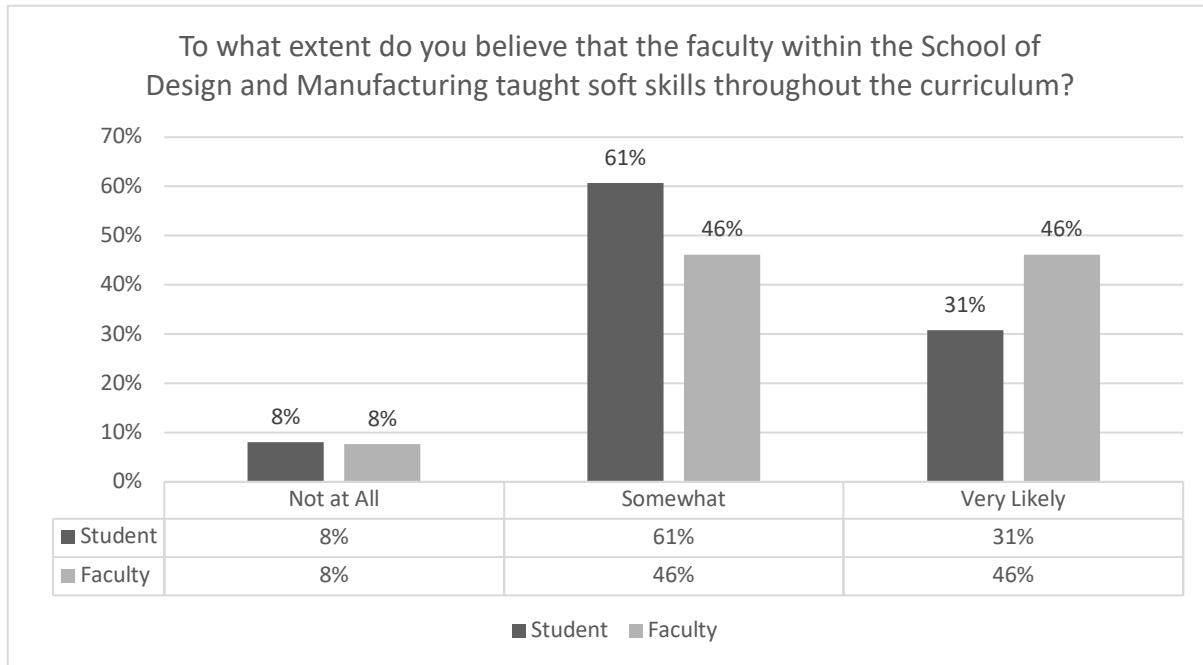
To what extent do you believe that the faculty within the School of Design and Manufacturing reinforced soft skills through career focused activities?

	Not at All	Somewhat	Very Likely
Student	2%	50%	48%
Faculty	8%	46%	46%
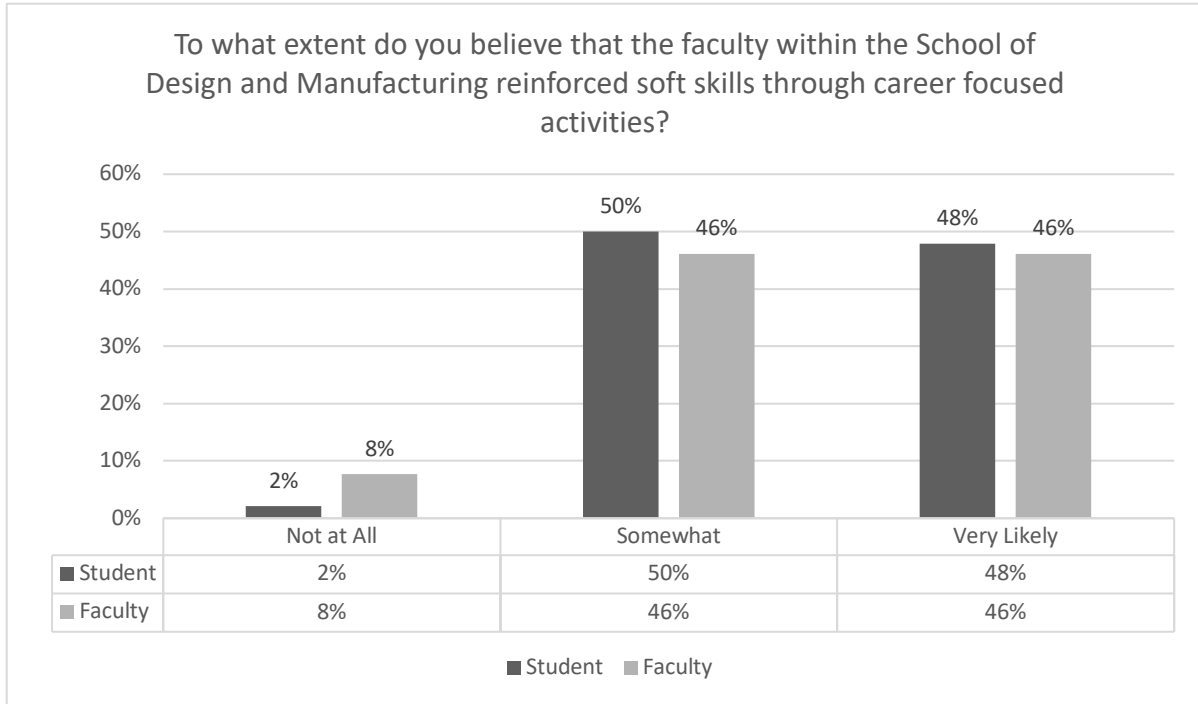
Figure 14. Participant responses to survey question 17.

Survey Question 18

Which (if any) of the following learning opportunities did you experience (have you incorporated) in your courses/program?

Students and faculty indicated which learning opportunities they experienced (or have incorporated) in their courses within the School of Design and Manufacturing. In total, 14% of students and 15% of faculty indicated that experiential learning took place; 3% of students and 1% of faculty indicated that role playing took place; 18% of students and 16% of faculty indicated that group work took place; 7% of students and 6% of faculty indicated that case studies were used; 15% of students and 16% of faculty indicated that collaboration and/or teambuilding activities were utilized; 15% of students and 19% of faculty indicated that writing was emphasized; 16% of students and 15% of faculty indicated that presentations were

conducted; and 12% of students and 9% of faculty indicated that workplace scenarios were

utilized to help reinforce the learning of soft skills (Figure 15).

Which learning opportunities did you experience (have you incorporated) in your courses/program?

	Experiential Learning	Role Playing	Group Work	Case Studies	Collaboration/ Team Building Activities	Writing	Presentations	Workplace Scenarios
Student	14%	3%	18%	7%	15%	15%	16%	12%
Faculty	15%	2%	16%	6%	17%	20%	15%	9%
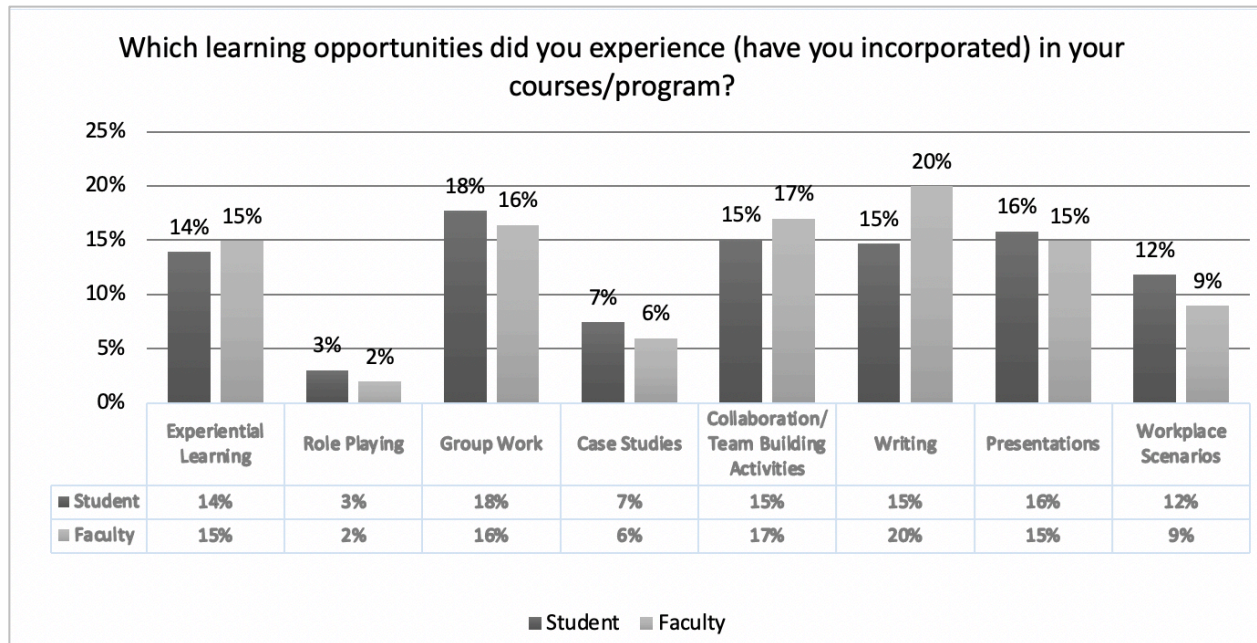
Figure 15. Participant responses to survey question 18.

Survey Question 19

Do you feel that your instructors/professors (you as an instructor/professor) have offered

you the opportunity to practice and demonstrate soft skills within your program-specific

courses?

Students and faculty indicated whether or not they felt that the instructors/professors

offered the opportunity to practice and demonstrate soft skills within the program-specific

courses. In total, 90% of students and 92% of faculty reported "yes" they do feel that the

instructors/professors offered the opportunity to practice and demonstrate soft skills within

the program-specific courses (Figure 16). In addition, 10% of students and 8% of faculty

reported that they did not feel that the instructors/professors offered the opportunity to

practice and demonstrate soft skills within the program-specific courses.
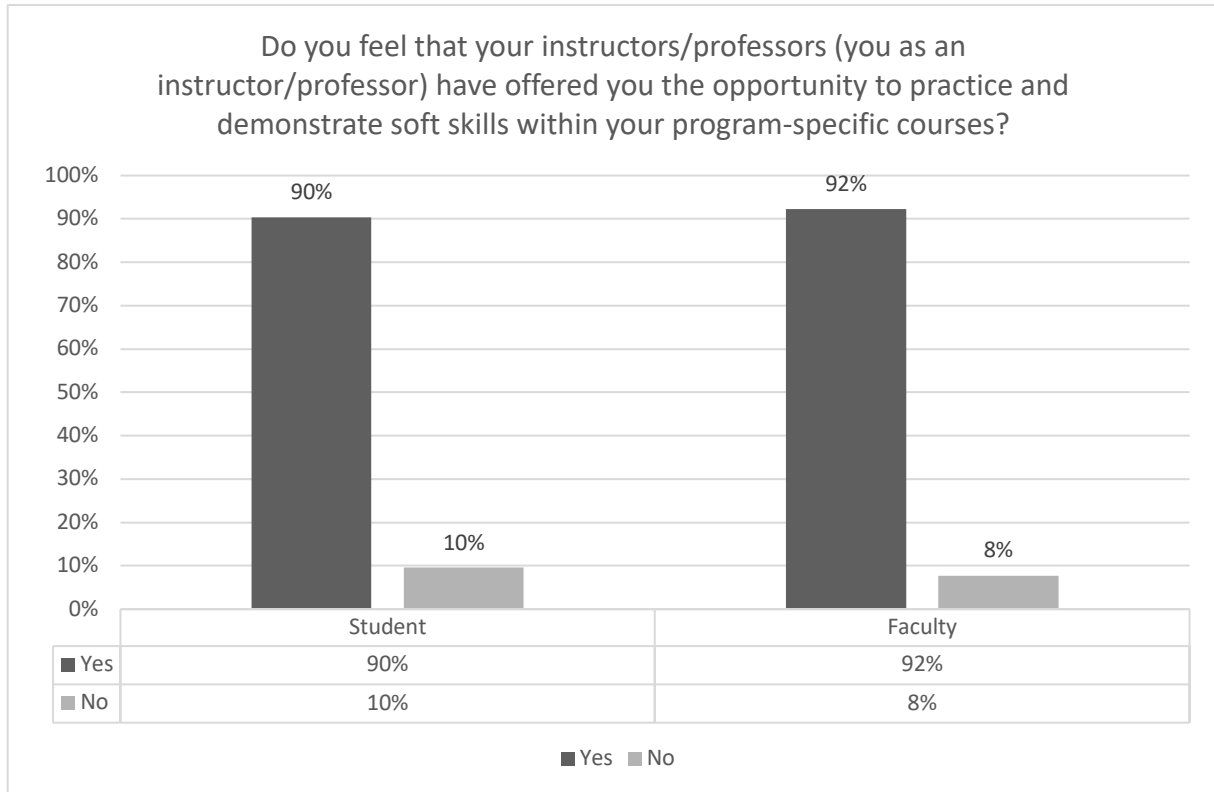
Figure 16. Participant responses to survey question 19.

Survey Question 20

Which of the following soft skills do you feel you have learned through courses in your

program?

Students and faculty indicated which soft skills they felt they had learned (taught)

throughout the courses within their program. In total, 13% of students and 14% of faculty

specified that critical thinking/problem solving had been taught within the program-specific

courses; 12% of both students and faculty specified that verbal communication skills had been

taught within the program-specific courses; 12% of students and 14% of faculty specified that

teamwork/collaboration had been taught within the program-specific courses; 9% of both

students and faculty specified that ethics and professional morals had been taught within the

program-specific courses; 11% of students and 9% of faculty specified that flexibility/

adaptability had been taught within the program-specific courses; 8% of students and 8% of

faculty specified that leadership had been taught within the program-specific courses; 10% of

both students and faculty specified that creativity/innovation had been taught within the

program-specific courses; 9% of students and 7% of faculty specified that lifelong learning had

been taught within the program-specific courses; 12% of students and 14% of faculty specified

that written communication skills had been taught within the program-specific courses; and,

finally, 4% of students and 3% of faculty specified that multicultural and diversity

understanding/sensitivity had been taught within the program-specific courses (Figure 17).

Comparative analysis of the percent of students who believe they were taught a skill versus the percent of faculty who believe they taught the skill in courses within the program (displayed in order of student rank of importance).

	Critical Thinking/ Problem Solving	Verbal Communication Skills	Teamwork/ Collaboration	Ethics and Professional Morals	Flexibility/ Adaptability	Leadership	Creativity/ Innovation	Lifelong Learning	Written Communication Skills	Multicultural and Diversity Understanding/ Sensitivity
Student	13%	12%	12%	9%	11%	8%	10%	9%	12%	4%
Faculty	14%	12%	14%	9%	9%	8%	10%	7%	14%	3%

Figure 17. Participant responses to survey question 20.

Survey Question 21

Do you believe that the School of Design and Manufacturing, as a whole, does a good

job teaching students the soft skills they will need to be successful students?

When asked to indicate whether or not they believe the School of Design and

Manufacturing does a good job of teaching students the soft skills they will need to be

successful students, 90% of students indicated that they did believe this to be true (Figure 18);

10% indicated that they did not believe this to be true. The faculty response to the same

question indicated that 85% of faculty believe that the School of Design and Manufacturing

does a good job teaching students the soft skills they will need to be successful students; 15% indicated they did not believe this to be true.
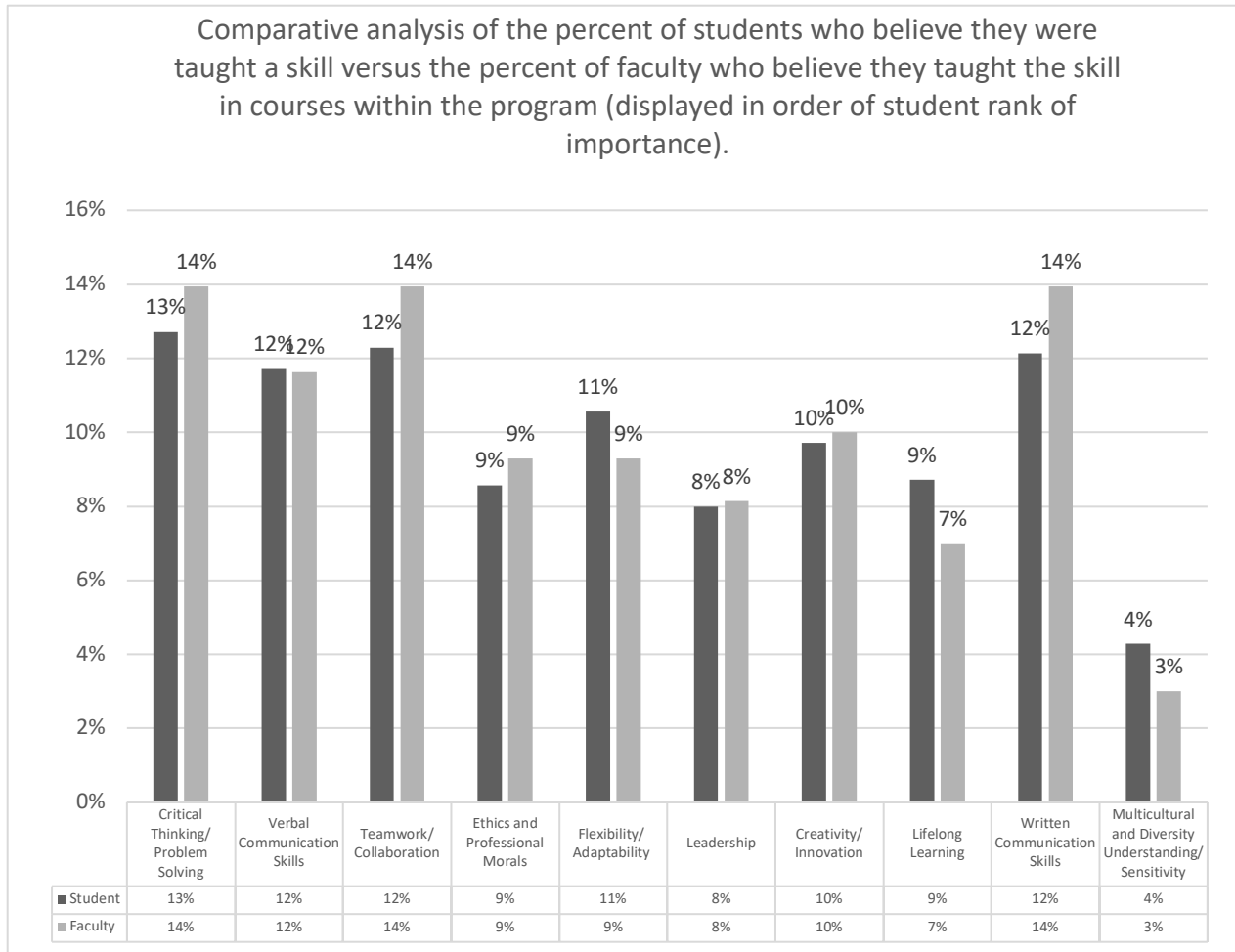

Figure 18. Participant responses to survey question 21.

Survey Question 22

   Do you believe that the School of Design and Manufacturing, as a whole, does a good job teaching students the soft skills they will need to prepare for internships?

   When asked to indicate whether or not they believe the School of Design and Manufacturing does a good job of teaching students the soft skills they will need to prepare them for internships, 93% of students indicated that they did believe this to be true (Figure 19). Only 7% indicated they did not believe this to be true. The faculty response to the same question indicated that 92% of faculty believe that the School of Design and Manufacturing

does a good job teaching students the soft skills they will need to prepare students for

internships. Only one of the faculty members did not believe this to be true.
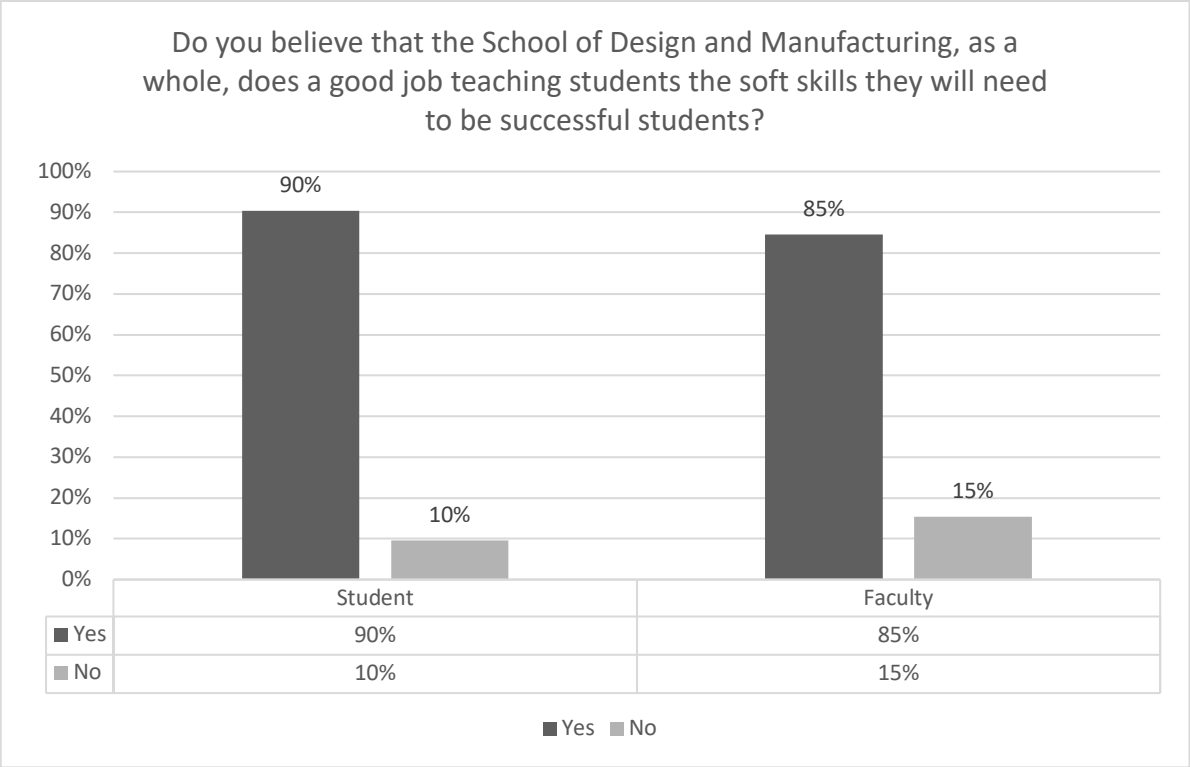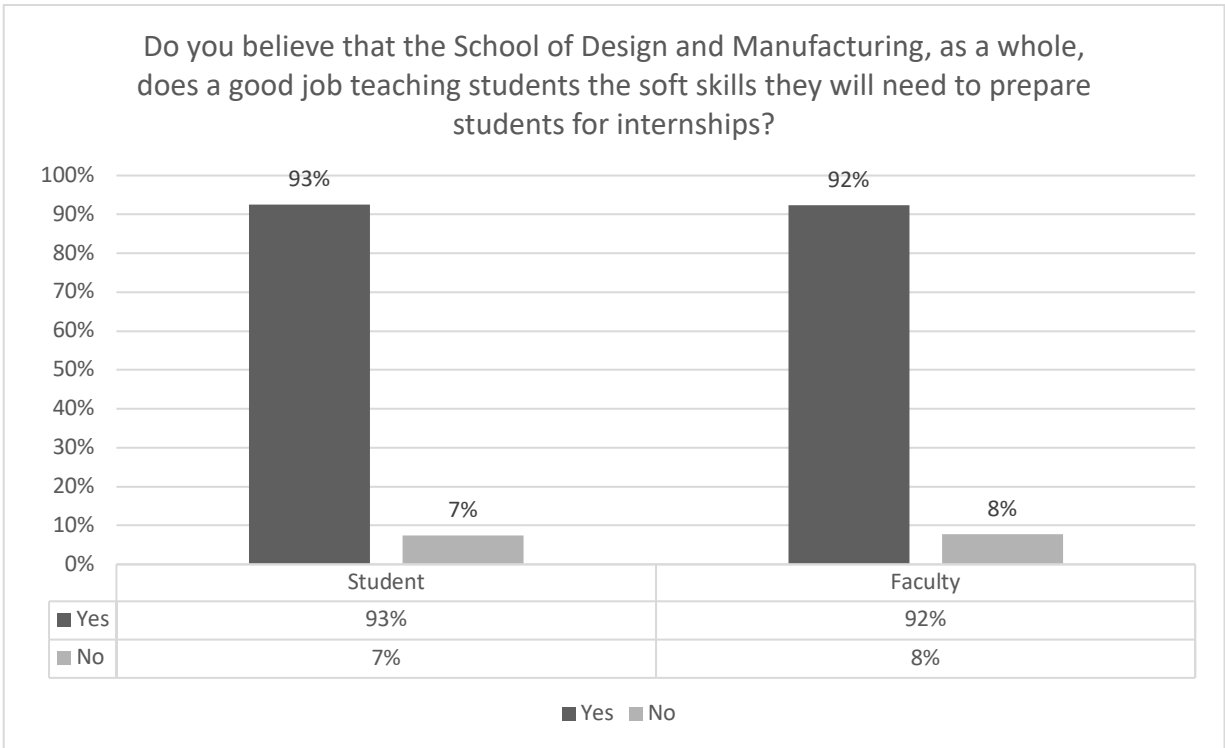

Figure 19. Participant responses to survey question 22.

Survey Question 23

Do you believe that the School of Design and Manufacturing, as a whole, does a good

job teaching students the soft skills they will need to be successful in your (their) career?

When asked to indicate whether or not they believe the School of Design and

Manufacturing does a good job of teaching students the soft skills they will need to be

successful in their career, 91% of students indicated they did believe this to be true (Figure 20);

9% indicated they did not believe this to be true. The faculty response to the same question

indicated 85% of faculty believe that the School of Design and Manufacturing does a good job

teaching students the soft skills they will need to be successful in their careers; 15% indicated

that they did not believe this to be true.

Figure 20. Participant responses to survey question 23.

Survey Question 24

Do you believe that the faculty within the School of Design and Manufacturing should do more to incorporate soft skills into their courses?

When asked to describe their beliefs on whether or not the university and/or the School

of Design and Manufacturing should do more to incorporate soft skills into their courses, 71%

of students indicated that they believe faculty should do more; 29% indicated they should not

(Figure 21). In addition, 46% of faculty indicated they should incorporate more soft skills into

their courses; 54% indicated they should not incorporate more.

Do you believe that the faculty within the School of Design and Manufacturing should do more to incorporate soft skills into their courses?

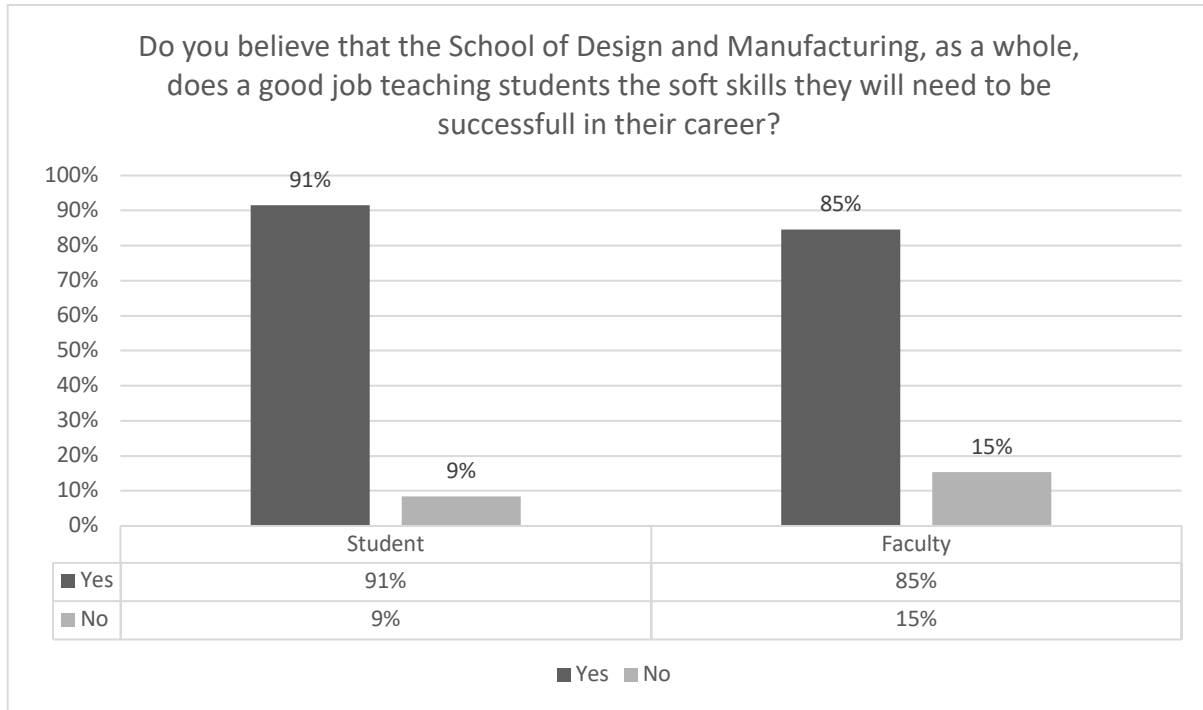|	Yes	No
■ Student	71%	29%
■ Faculty	46%	54%

■ Student ■ Faculty
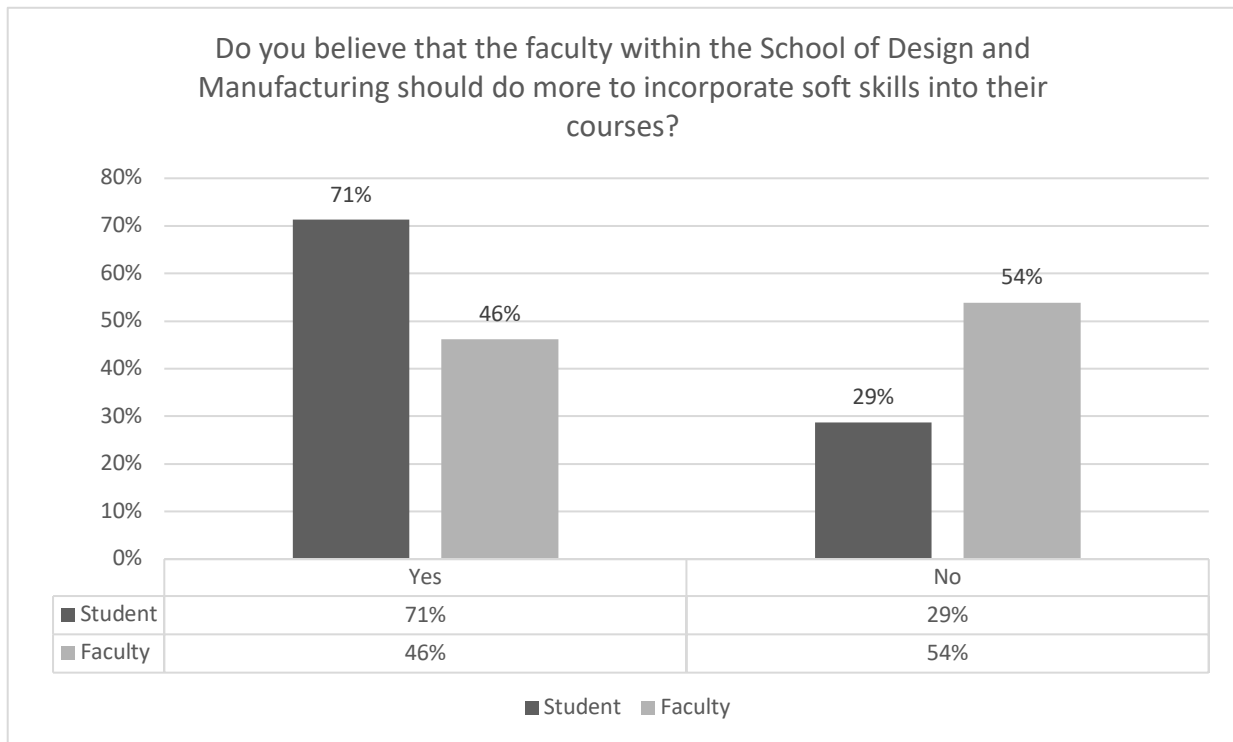
Figure 21. Participant responses to survey question 24.

Survey Question 25:

Do you believe that [the University] and/or the School of Design and Manufacturing should offer some sort of credential for students who master soft skill competency criteria (i.e., digital badging, indication on academic transcript, etc.)?

When asked to describe their beliefs on whether or not the university and/or the School of Design and Manufacturing should offer some sort of credential for students who master soft skill competency criteria, 57% of students indicated that they believe this should be offered; 43% indicated it should not (Figure 22). In addition, 8% of faculty indicated the university and/or the School of Design and Manufacturing should offer some sort of credential for students who master soft skill competency criteria; 92% indicated they should not.

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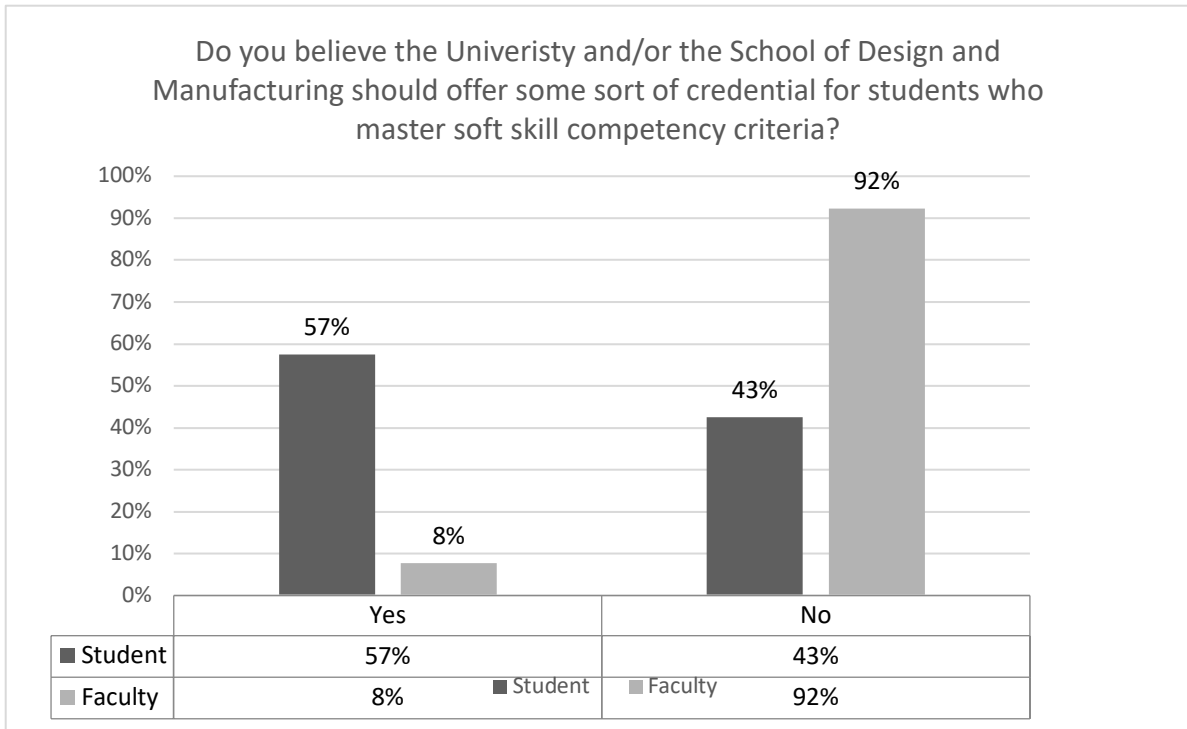
Figure 22. Participant responses to survey question 25.

Survey Question 26

Which of the following best reflects your current program of study?

Participants indicated their current program of study within the School of Design and Manufacturing: 13% of students and 46% of faculty indicated they were part of the Manufacturing Engineering Technology program; 44% of students and 23% of faculty indicated they were part of the Plastics Engineering Technology program, and 44% of students and 31% of faculty indicated they were part of the Welding Engineering Technology program (Figure 23).
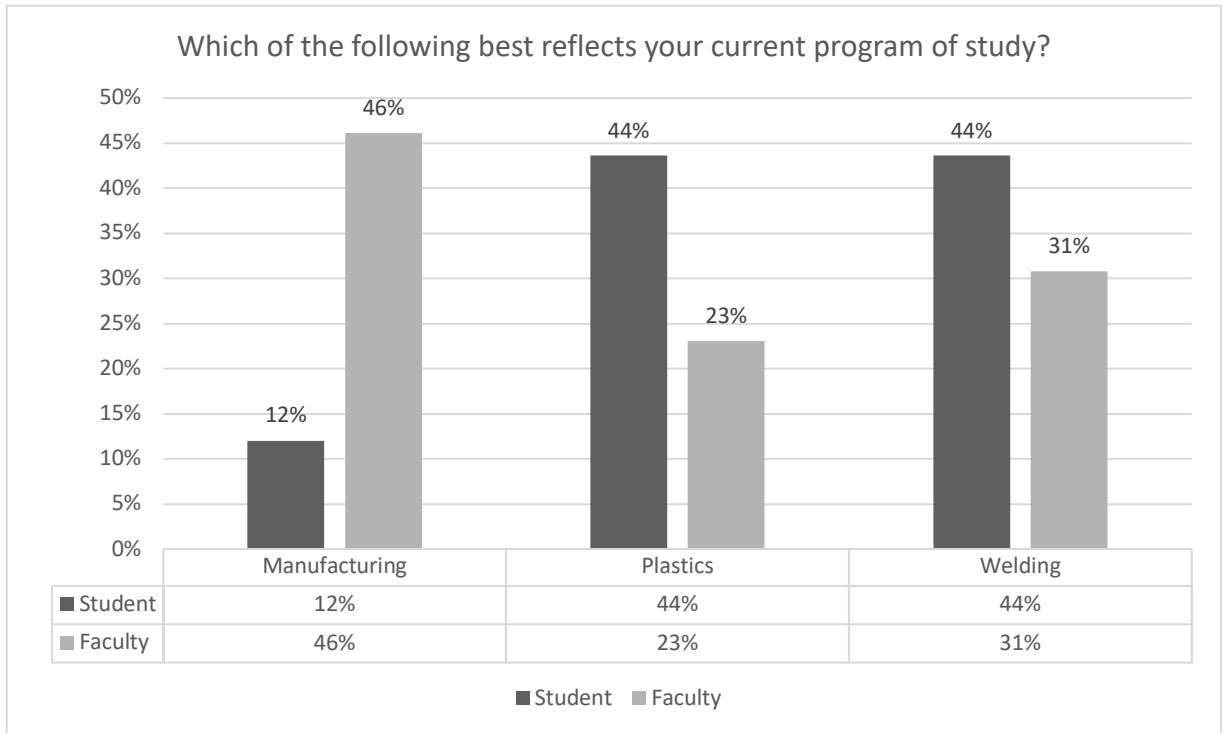
Figure 23. Participant responses to survey question 26.

Survey Question 27

Soft skills can also be learned outside of the classroom. Where are some other places you feel that you have learned soft skills outside of the classroom (this can be in any aspect of your life)?

When students and faculty identified places outside of the classroom for learning soft skills, respondents indicated several possibilities. Eight themes emerged from the data and represent the responses (Figure 24): 12% of students and 9% of faculty associated soft skill development with participation in athletics/sports; 10% of students and 9% of faculty associated soft skill development with one's family/upbringing; 23% of students and 13% of faculty associated soft skill development with completing internships; 8% of students and 26% of faculty associated soft skill development with joining a registered student organization; 16%

of students and 22% of faculty associated soft skill development with participating in social

events; 29% of students and 13% of faculty associated soft skill development with workplace

culture; and 9% of faculty (0% students) associated soft skill development with belonging to a

professional organization.
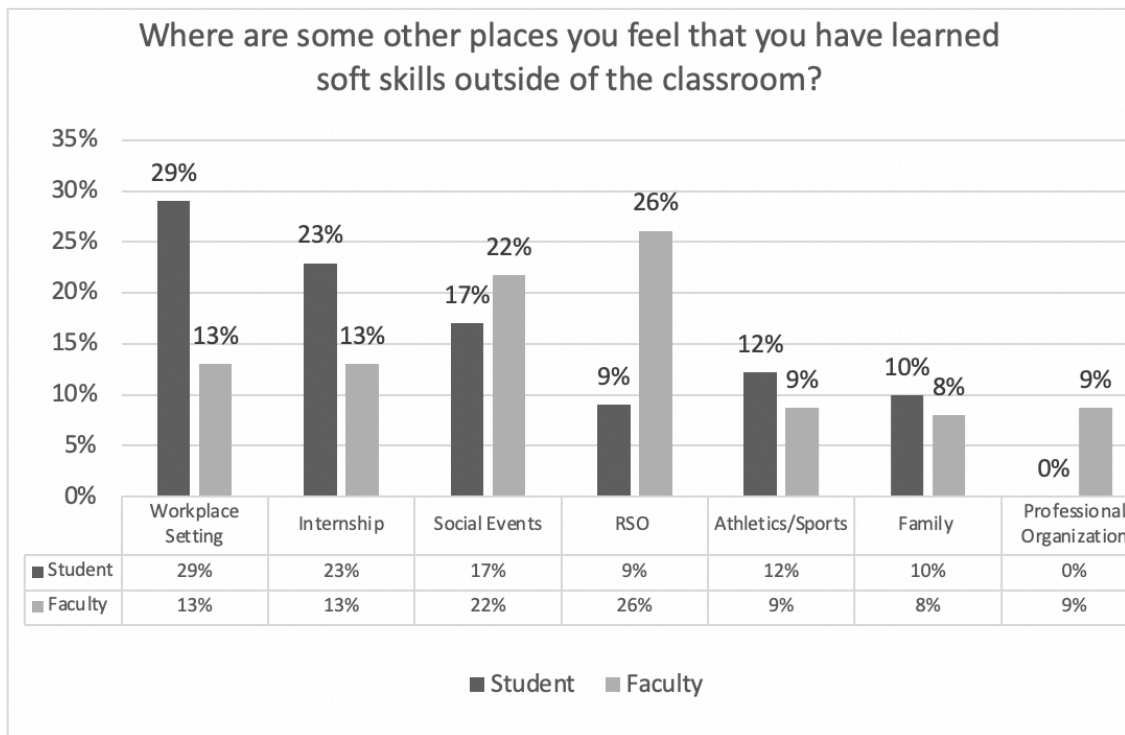
Figure 24. Participant responses to survey question 27.

Survey Question 28

Do you __typically__ teach 100/200 level courses, 300/400 level courses, or both?

When faculty participants indicated the level of courses they typically teach (100/200,

300/400, or both/all levels) within the School of Design and Manufacturing, 69% indicated

teaching all levels of coursework, 23% indicated teaching 300/400 level courses, and 8%

indicated teaching 100/200 level courses (Figure 25).
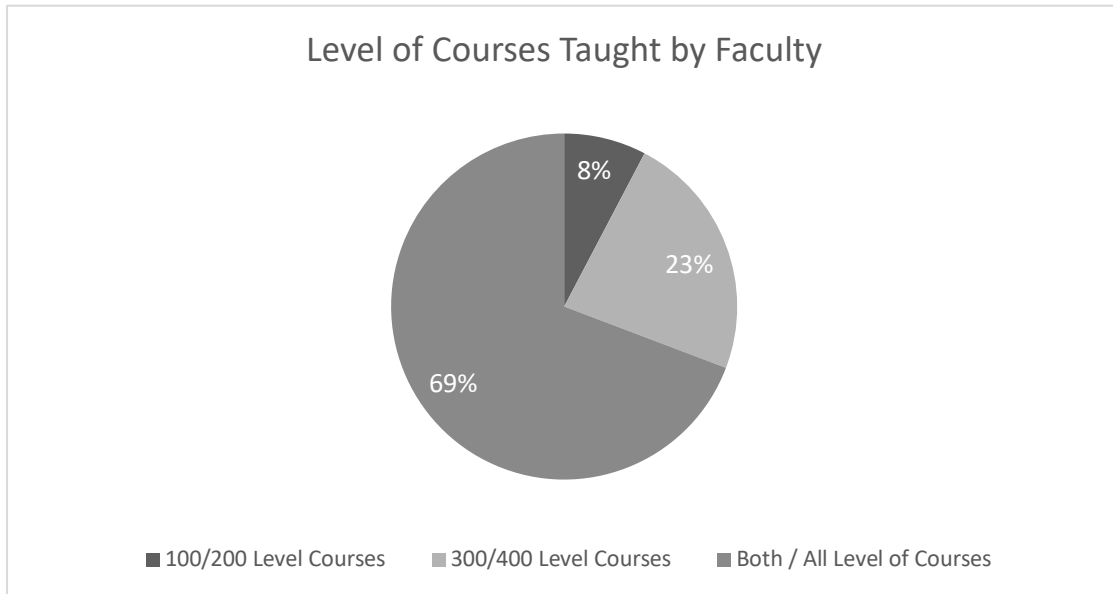
Figure 25. Participant responses to survey question 28 (faculty only).

SUMMARY OF OUTCOMES

Research Question 1

What are the perceptions among students related to the importance of soft skills on

college (academic) and career (employment) success?

As the data reflect, students within the School of Design and Manufacturing find soft

skills to be important for both college and career success. The data show 89% of students

believe soft skills are at least moderately important to a student's academic success.

Additionally, 90% of students reported soft skills as either important or very important to a

student's career success. Students ranked their top five soft skills as (1) critical thinking/

problem solving (2.97), (2) verbal communication skills (4.32), (3) teamwork/collaboration

(4.45), (4) ethics/professional morals (4.46), and (5) flexibility/adaptability (5.19).

More specifically, 94% of students reported that they believe the mastery of soft skills contributes to achieving higher grades. Additionally, virtually all students (99%) believe the mastery of soft skills contributes to landing an internship, gaining advancement or promotion, and earning a higher salary. Finally, 100% of students believe the mastery of soft skills contributes to securing a job and establishing better relationships with co-workers.

Research Question 2

What are the perceptions among faculty related to the importance of soft skills on college (academic) and career (employment) success?

As the data reflect, faculty within the School of Design and Manufacturing find soft skills to be important for both college and career success. The data show that 100% of faculty believe soft skills are at least moderately important to a student's academic success. Additionally, 100% of faculty reported soft skills as either important or very important to a student's career success. Faculty ranked their top five soft skills as (1) critical thinking/problem solving (2.69), (2) ethics/professional morals (3.38), (3) teamwork/collaboration (4.00), (4) verbal communication skills (4.62), and (5) flexibility/adaptability (5.54).

More specifically, 92% of faculty reported that they believe the mastery of soft skills contributes to achieving higher grades. Additionally, 100% of faculty believe the mastery of soft skills contributes to landing an internship, gaining advancement or promotion, and earning a higher salary. Finally, 100% of faculty believe the mastery of soft skills contributes to securing a job and establishing better relationships with co-workers.

Research Question 3

How do the perceptions about the importance of soft skills on college (academic) and

career (employment) success compare between students and faculty?

Throughout the data, many comparisons can be made between the perceptions of soft

skills among students and faculty. While the alignment is not a direct one for one comparison,

both students and faculty listed the same five soft skills in their top five rankings (Table 5). A

majority of both students and faculty (69% each) believe that soft skills are either important or

very important to a student's educational success (Figure 1). Another point of commonality

within the data is that the skill of multicultural and diversity understanding/sensitivity was

ranked as the least important soft skill by both students and faculty (Table 5).

According to the data, 90% of students and 100% of faculty indicate that soft skills were

either important or very important to a student's career success (Figure 2). Additionally, over

90% of both students and faculty believe that the mastery of soft skills contributes to students

achieving higher grades (Figure 4), students obtaining an internship (Figure 5), students

securing a job (Figure 6), students achieving a higher salary (Figure 7), a student's ability to

maintain employment (Figure 8), advancement or promotion (Figure 9), better relationships

with co-workers (Figure 10), and being more productive at work (Figure 11).

A discrepancy in the data exists between the perceptions of students and faculty when

asked to what extent soft skills contribute to learning course/program outcomes. Of the

students surveyed, 48% believed it was very likely that a student's mastery of soft skills

contributed to learning course/program outcomes, while only 23% of faculty believed the same

thing (Figure 3).

Research Question 4

Based on student perceptions, to what extent are soft skills included in the program curriculum?

Both students and faculty ranked critical thinking/problem solving as the most important soft skill, and 93% of students reported that critical thinking/problem solving had been taught within the program-specific courses. Based on the survey, students indicated that verbal communication skills are the second most important soft skill, and 85% of students believe that these skills had been taught throughout the program. Students ranked teamwork/collaboration as the third most important soft skill, and 90% of students believe that these skills had been taught in the program. Students ranked ethics/professional morals as the fourth most important soft skill, and 63% of students believe that these skills had been taught in the program. Finally, students ranked flexibility/adaptability as the fifth most important soft skill, and 77% of students indicated that this skill had been taught in program.

Research Question 5

Based on faculty perceptions, to what extent are soft skills included in the program curriculum?

As previously noted, both students and faculty ranked critical thinking/problem solving as the most important skill, and 92% of faculty reported that critical thinking/problem solving had been taught within the program-specific courses. Based on the survey, faculty indicated that ethics/professional morals are the second most important ranked soft skill, and 62% of faculty believe that these skills had been taught throughout the program. Faculty ranked teamwork/collaboration as the third most important soft skill, and 92% of faculty believe that

these skills had been taught in the program. Faculty ranked verbal communication skills as the fourth most important soft skill, and 77% of faculty believe that these skills had been taught in the program. Finally, faculty ranked flexibility/adaptability as the fifth most important soft skill, and 62% of faculty indicated that this skill had been taught in program.

Research Question 6

How do the perceptions about the extent soft skills are included in the program curriculum compare between students and faculty?

The data indicate that both students (92%) and faculty (92%) believe the faculty within the School of Design and Manufacturing teach soft skills throughout the curriculum (Figure 13). Also, 98% of students and 92% of faculty believe the faculty reinforced soft skills through career-focused activities (Figure 14). In addition, 90% of students and 92% of faculty believe the faculty have offered the opportunity to practice and demonstrate soft skills within the program-specific courses (Figure 16). Finally, 90% of students and 85% of faculty believe that the School of Design and Manufacturing does a good job teaching students the soft skills they will need to be successful students (Figure 18).

While some perceptions of the amount of soft skills being taught align, there is a slight difference between students and faculty (Tables 5, 6, and 7). Both students and faculty ranked critical thinking/problem-solving skills as the most important soft skill, and both students (93%) and faculty (92%) believed these skills were being taught within the program-specific courses (Tables 6 and 7). Although students indicated that ethics/professional morals are the fourth most important soft skill, and faculty indicated it is the second most important soft skill (Table 5), only 63% of students and 62% of faculty perceive these skills being taught in program-

91

specific courses. It is important to also point out that the skill of multicultural and diversity understanding/sensitivity received the lowest ranking of importance from both students and faculty and the lowest percentage from both students (31%) and faculty (15%) when asked if they believed it was taught within the program-specific courses.

The research conducted a comparative analysis of the student and faculty perceptions of the soft skills taught within the program. For this analysis, any comparative differences of 10 percentage points or higher were considered important to note. When asked if flexibility/adaptability was being taught in the program, 77% of students and 62% of faculty believed it was being taught (Δ 15%). When asked if leadership was being taught in the program, 67% of students and 54% of faculty believed it was being taught (Δ 13%). When asked if lifelong learning was being taught in the program, 64% of students and 46% of faculty believed it was being taught (Δ 18%). When asked if multicultural and diversity understanding/ sensitivity was being taught in the program, 31% of students and 15% of faculty believed it was being taught (Δ 16%). In each of these comparisons, student perceptions indicated that the skill was being taught at a higher percentage than the faculty perception indicated.

Overall Findings

In addition to the previously mentioned findings, the research gleaned the following conclusions. Beyond the skills of critical thinking/problem solving, teamwork/collaboration, and flexibility/adaptability, the data reflect a difference in perception of importance between students' and faculty rankings. Also, faculty ranked ethics/professional morals as the second most important soft skill (Table 5), yet only 63% of students (Table 6) and 62% of faculty (Table 7) indicated that this skill was being taught in program-specific courses.

In general, students report soft skills being taught more than faculty report teaching them, with the exception of teamwork/collaboration and written communication skills (Tables 6 and 7). While a high percentage of both students (89%) and faculty (92%) indicated written communication skills were taught in program-specific courses (Tables 6 and 7), students ranked this as the ninth most important skill, and faculty ranked this as the sixth most important skill (Table 5).

Additional points of important comparison include a comparative analysis between students and faculty when asked if the faculty within the School of Design and Manufacturing should do more to incorporate soft skills into their courses. While 71% of students believe that faculty should do more, only 46% of faculty believe they should do more (Figure 21). Additionally, when asked if they believe the university and/or School of Design and Manufacturing should offer some sort of credential for students who master soft skill competency, 57% of students and only 8% of faculty indicated that this should be done.

SUMMARY

Data presented in this chapter represent 94 student participants and 13 faculty participants, a total of 107 participants. Descriptive and comparative presentation of the data reflects the perceptions of soft skills among both students and faculty within the School of Design and Manufacturing.

The final chapter (Chapter V) includes a discussion of the importance of the research, implications of the research, and recommendations for further study and action.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

This chapter presents a summary of the purpose and need for the study regarding the perceptions of students and faculty on the importance of soft skills as they pertain to educational and career success and advancement. In addition, this chapter offers discussion of (a) key findings, (b) potential implications, and (c) recommendations for further research.

PURPOSE OF STUDY

Comparisons between the perceptions of students to those of industry and business leaders appear throughout the literature. This study furthers insight through inquiry about the perceptions of students and faculty in the postsecondary setting. The primary focus of this study was comparison of perceptions among students and faculty within a technical career field. The purpose of this study was to understand the perceptions of soft skills among students and faculty within the School of Design and Manufacturing at a regional master's-level university. The following research questions framed the study:

1. What are the perceptions among students related to the importance of soft skills on college (academic) and career (employment) success?

2. What are the perceptions among faculty related to the importance of soft skills on college (academic) and career (employment) success?

3. How do the perceptions about the importance of soft skills on college (academic) and career (employment) success compare among students and faculty?

4. Based on student perceptions, to what extent are soft skills included in the program curriculum?

5. Based on faculty perceptions, to what extent are soft skills included in the program curriculum?

6. How do the perceptions about the extent soft skills are included in the program curriculum compare among students and faculty?

REVIEW OF METHODOLOGY

This study used a quantitative descriptive study with a comparative design approach, allowing for the comparison of survey data across different question stems. This methodology allows for an investigation and description of the differences, or lack thereof, between survey participants but does not attempt to explain why the differences occur. The data collection in this study is observational in nature and aims to determine a description of perceptions as they relate to each of the research questions.

For the purpose of this study, sampling within the School of Design and Manufacturing occurred. The population of the study was senior-level students and their faculty within the School of Design and Manufacturing at a regional master's-level university. During the time of the study, there was a total 108 senior-level students and 21 faculty members in the School of Design and Manufacturing, of which 94 students (87%) and 13 faculty (61.9%) completed the survey for the study. The targeted approach used in this study allowed for a focused and meaningful analysis of the data to study a specific population of students. The data allowed for understanding about the perceptions of soft skills specific to the academic programs included in the study.

DISCUSSION OF FINDINGS

Chapter IV presented findings from the six research questions of this study. The study of perceptions among students and faculty within the School of Design and Manufacturing created the opportunity for a data-rich comparative analysis to be conducted. The evidence and interpretations presented follow data provided by students and faculty. Analysis of these findings allowed the researcher to draw conclusions and recommendations for further action and research.

According to the study, 100% of faculty and 89% of students believed that soft skills were at least moderately important for academic success. Furthermore, 100% of faculty and 97% of students believed that soft skills were at least moderately important for career success. Based on an analysis of the relevant literature and the data derived from this study, soft skills appear important to virtually all stakeholders in the pathway to a career. Employers, however, claim college graduates lack the skills necessary to thrive in their careers. Two potential reasons for this disparity include (a) employers having unrealistic expectations for college graduates— skills resulting from years of on-the-job experiences, and (b) additional opportunity for postsecondary educators and institutions to incorporate, help students master, and assess soft skill competencies.

Other than the skills of teamwork/collaboration and written communication, the data reflect student perception of soft skills as taught at a higher level than faculty report teaching these same skills. This could mean students are making connections between coursework and soft skills that instructors do not realize. This may also indicate opportunities where instructors

could review course learning objectives and exercises to more clearly denote soft skill development.

While all three programs require an internship experience between a student's junior and senior year, the Plastics Engineering Technology program also requires an earlier internship between a student's freshman and sophomore year. When the data for this study are disaggregated based on a student's program of study, the difference of the extra internship does not seem to create a discrepancy between the perceived importance of soft skills among the three programs. In fact, the only time that a noticeable difference appeared was when the students were asked about the importance of soft skills on their education (Figure 26). As illustrated in the graph, 78% of students in the Plastics Engineering program believe soft skills are either important or very important to their educational success, while only 67% of Manufacturing Engineering students and 61% of Welding Engineering students believe soft skills are either important or very important to their educational success. This could be due to the fact that Plastics Engineering students participate in one additional internship.
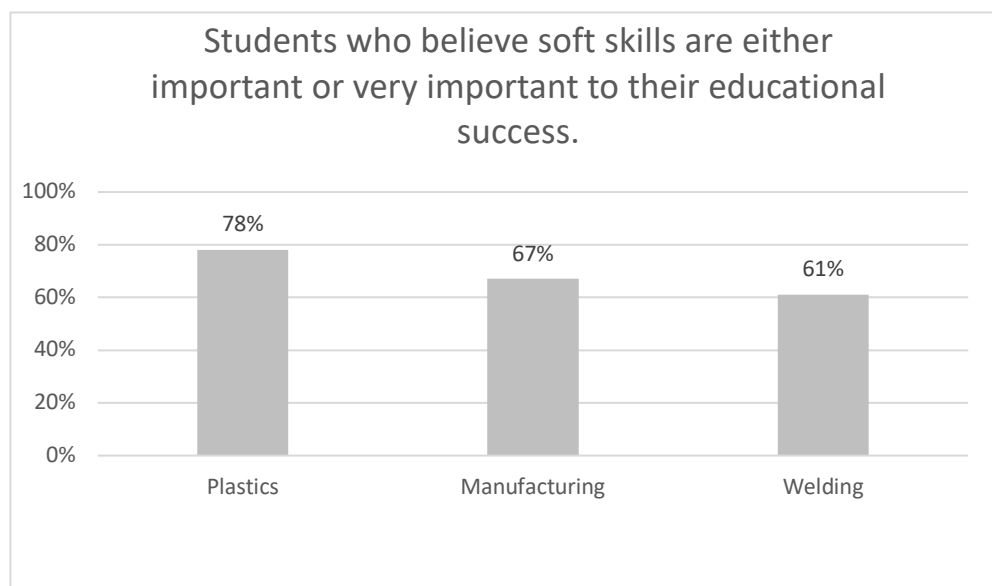

Figure 26. Student responses to the importance of soft skills on education success.

Table 9 illustrates a cross-reference ranking of each of the 10 soft skills discussed within this study. The table includes data from the 2018 NACE Job Outlook report, School of Design and Manufacturing (SDM) student and faculty rankings, and the rankings based on the frequency of soft skills mentioned within the review of literature. This table is included to provide a comparative illustration of how soft skills are perceived among and between employers (NACE 2018 Ranking), students (SDM Student Ranking), faculty (SDM Faculty Ranking), and the literature (Rank Based on Frequency in Literature). It is important to note that critical thinking/problem solving was ranked the highest by NACE, students, and faculty. Another point of similarity is that teamwork/collaboration ranked within the top three among all four sources of data. The research also found it intriguing that while multicultural and diversity understanding ranked at the bottom of the four data sets, it is seen as a strength of the younger workforce (Kavanagh, 2017). Finally, while there is much agreement on the importance of soft skills, this table proves that it is difficult to rank the importance of these skills and may differentiate based on specifics of occupational requirements.

Table 9: *Comparison Between the NACE Attributes Employers Seek on a Candidate's Resume, Student and Faculty Perceptions of Soft Skills Being Taught in the Courses/Program, and Frequency of Soft Skills Mentioned in the Literature*

SOFT SKILLS (IN ALPHABETICAL ORDER)	NACE 2018 RANKING	SDM STUDENT RANKING	SDM FACULTY RANKING	RANK BASED ON FREQUENCY IN LITERATURE
Creativity/Innovation	16	7	8	6
Critical Thinking/Problem Solving	1	1	1	4
Ethics/Professional Morals	5	4	2	7
Flexibility/Adaptability	10	5	5	9

Soft Skills (in alphabetical order)	NACE 2018 Ranking	SDM Student Ranking	SDM Faculty Ranking	Rank Based on Frequency in Literature
Leadership	4	6	7	5
Lifelong Learning		8	9	8
Multicultural and Diversity Understanding	17	10	10	10
Teamwork/Collaboration	2	3	3	3
Verbal Communication Skills	7	2	4	1
Written Communication Skills	3	9	6	1

(National Association of Colleges and Employers, 2018)

IMPLICATIONS

Findings from this study provide educational opportunities for students and faculty. The data can serve to benefit students in their ability to better understand the importance of learning what soft skills are and learning how to apply soft skills in workplace scenarios. Additionally, findings from the study benefit students by surfacing those skills required in senior-level courses and beyond. Bringing attention to the skills employers seek earlier in a student's academic career will serve to focus the student's attention on those skills and to seek out opportunities to learn and strengthen these skills within their coursework. Without adequate knowledge of what soft skills are and why they are important, students may miss out on fully appreciating a learning opportunity to their greatest potential when the skills are utilized in coursework.

The data and findings of this study allow for deliberative dialogue among and between students and the faculty within each of the programs in the School of Design and Manufacturing concerning alignment (or lack of) and importance of soft skills within the

curriculum and the workplace. Potential discussion prompts for these deliberative dialogues could include:

- What skills will be needed to work with customers within your field?

- What skills will be needed to circumvent [*insert problem relevant to field*]?

- What do employers in your field say they look for in employees?

- What types of skills typically appear on a job posting in your field?

- Why might an employer seek a candidate with [*insert specific skill*]?

If faculty are deliberate in their approach to incorporating soft skills within their curriculum and ensuring students understand not only the importance but also the relevance to their future careers, it may provide a more dynamic opportunity for learning. Additionally, the deliberateness and intentionality of continually discussing and utilizing soft skills within the course will serve to reinforce their importance with the students. However, faculty should try to refrain from doing only one (discussion or implementation) in isolation. It is imperative that faculty not only discuss the importance and relevance of soft skills, but also model the skills themselves and incorporate opportunities for students to use the skills throughout their entire academic program.

The school and individual programs could also benefit from the data collected and the findings of this study. Specifically, presentation of the results would allow for the creation of promotional material to recruit future students and employers seeking credentialed, career-ready graduates. The data from this study and potential similar studies performed within other schools and colleges can serve to help faculty and administrators understand and compare the perceptions of their faculty and students in regard to not only the importance of soft skills, but

also the extent to which they believe the skills are being incorporated into the curriculum. When programs begin to look into potential curriculum review, the data can serve as one source of information to help guide this process.

If institutions of higher education are going to continue to prove themselves as worthy recipients of student dollars, they must absolutely find ways of helping these students learn the soft skills they need to be a part of a productive and advancing workforce. Data from this study could be used to help prove the connection between what employers want from future employees and the information the students will learn throughout the program. This study could also be replicated at the institution-wide level to garner data on the perceptions of student and faculty across all colleges, programs, and departments.

CRITIQUE OF THE STUDY

This study used a quantitative methodology with a descriptive comparative design to analyze the perceptions of both students and faculty in regard to the importance of and incorporation of soft skills. The data considered the perceived relevance and importance of soft skills as they apply to both the education and career of a student. The sample included senior-level students and faculty within the School of Design and Manufacturing.

One critique of this study is that the definition developed for the study used the word *interpersonal*, when in fact not all soft skills are interpersonal. While many soft skills are interpersonal in nature, several are not necessarily interpersonal by definition, for example, skills such as critical thinking, problem solving, ethics, professional morals, creativity, innovation, lifelong learning, and written communication skills. The inclusion of the term

interpersonal within the definition may limit what some participants view as soft skills and therefore distract or influence their answers to some questions.

In this quantitative study, the sample and sample size limit the generalization of the study to other schools or institutions. Replication of this study in different settings would provide further insight and eventually a greater breadth of generalizability. The limited sample size of this study could be considered as an additional limitation to this study. While the student aspect of this study included 87% of all senior-level students within the School of Design and Manufacturing, only 61.2% of the faculty responded to the survey. One potential reason for this difference in response rate may be that the researcher administered all student questionnaires in face-to-face settings but chose to rely solely on electronic mail to distribute the faculty questionnaire.

Another potential limiting factor could be a consideration that the faculty who returned the questionnaire could represent a subsample of the entire faculty body within the School of Design and Manufacturing. This subsample may be more representative of faculty that are more engaged and who are generally more likely to implement new processes within their courses. The implications of this potential could mean that the remaining 38.8% of the faculty have different perceptions on the importance of soft skills and the degree to which they are being implemented within their classes.

RECOMMENDATIONS

While it may be unrealistic, many employers now expect new employees to possess the same type of soft skills as their most senior-level workers. According to Lindzon (2015), companies who were forced to downsize during the recession of 2008-2009 are now re-staffing

with younger employees, yet many still hold these younger team members to the same expectations as the more seasoned members. College graduates, regardless of the level of education they have received, will always need to be trained in the nuances of the specific job they will be asked to do. In addition, while recent college graduates may lack some of the skills of the more seasoned employees, they also possess many new skills, such as a better understanding of social media and technology, a greater entrepreneurial drive, and a greater awareness and appreciation for global diversity (Kavanagh, 2017). The expectation that college graduates will enter the workforce with a mastery of skills such as leadership and problem solving is just not realistic, regardless of how well these skills are incorporated into their college curriculum.

This, however, does not mean that institutions of higher education should dismiss the idea of attempting to incorporate soft skills into the curriculum. There is no doubt that stakeholders of all kinds believe that soft skills are important, and for this reason alone, colleges and universities must understand the importance of ensuring their students gain at least a cursory and foundational awareness of the importance of soft skills. As stated in previous chapters, it is not enough to incorporate soft skills into the general education curriculum. While this is a starting point and will serve to provide that foundational knowledge about soft skills, it does not incorporate important, occupational-specific skills.

Institutions of higher education have opportunity to extend traditional technical skill training through focus on development of the whole student. Postsecondary institutions should find ways to embed the essential soft skills within the courses that are already focused on the technical or hard skills. Further research within other schools and at other colleges and

universities would further reveal opportunities to align soft skill development with employer expectations.

The literature suggests that employers seek to hire employees with not only an understanding of soft skills, but also the ability to prove their competency in these skills. Stakeholders within institutions of higher education, including administrators, faculty, and students, should understand the importance of soft skills and work to ensure that soft skill training is incorporated into the curriculum.

Recommended Action

Institutional leaders concerned with students acquiring and being able to demonstrate the soft skills employers seek may replicate this, or a similar study. This action provides the benefit of data to aid curricular planning. Those individuals serious about implementing soft skills into their curriculum might leverage this study's methodology as a framework, or as the initial step within a larger initiative concerned with student learning outcomes.

A brief review of the student learning outcomes associated with a program or course could help to determine the intended focus of the curriculum. A lack of soft skill-specific terminology (i.e., communication, teamwork, problem solving, etc.) within the student learning outcomes may serve as an initial glance as to the rate at which soft skills are being addressed. A further analysis of the student learning outcomes in comparison with the data gathered from the implementation of the study discussed in this paper may provide a more robust examination of not only the perceptions of students and faculty, but also the extent to which the perceived important skills are being assessed and measured within the courses and programs.

Perhaps a natural place for the implementation of soft skills to exist would be within general education courses. This could be done with a focus placed on ensuring general education courses meet specific soft skills objectives that are necessary across the vast array of occupations. Implementing the soft skills pedagogy into general education courses will ensure that all students, regardless of program, would be introduced to the idea and importance of soft skills. However, this approach will also limit the connection between soft skills to specific industry needs.

Some institutions may choose to take the implementation of soft skills even further and implement a soft skills measurement and certification framework within every one of its programs. Davenport University developed "The Excellence System—a data-driven method" that integrates nine competency areas (global and intercultural competence, civic and social responsibility, ethical reasoning and action, critical and creative thinking, analysis and problem solving, leadership and teamwork, information and technology proficiency, written communication, and professional communication) throughout the curriculum of each of their majors (Perkins, 2018).

There is a difference between introducing the concept of soft skills and a student's actual ability to apply skills in real-world, career-specific situations and settings. Faculty with direct industry experience may fashion cases or scenarios to support practice and skill improvement. Additionally, advisory boards and program-accrediting bodies may serve as good sounding boards to determine the most essential soft skill needs within a specific career field. Furthermore, regional accrediting bodies may also provide colleges and universities with the perfect opportunity to devote time and resources to improving their focus on soft skills by

deeming it a Quality Initiative project within the institution. For example, the Higher Learning Commission (HLC) encourages institutions to propose its own Quality Initiative that suits the present concerns or aspirations of the institution and to use the quality initiative approach to "take risks, aim high and learn from only partial success or even failure," a great skill within itself (Higher Learning Commission, 2020).

If institutions of higher education plan to implement soft skills into the curriculum, assessing the overall value of their efforts will be necessary, not only to generate buy-in from stakeholders, but also to serve as proof of student mastery to potential employers. According to Hanover Research (2014), "Traditional instruction and assessment do not always provide the appropriate tools for developing and measuring student success outside of traditional academic subject areas" (p. 3). Tevdovska (2015) noted that it can be hard to assess soft skills with standard summative assessment methods, and often the assessments that do take place are based on subjective evaluation. Traditional report cards and transcripts award holistic grades in individual subjects but fail to describe the specific areas in which a student excels or struggles, or how their knowledge transcends across curriculum.

One way to assess and ensure that graduates leave with the soft skills they need is by implementing soft skill assessments as requirements for graduation. Southeast Missouri State University, for example, implemented a written communication assessment that is required upon completion of 75 semester hours and successful performance on the exam is required for graduation (Beard et al., 2008). Davenport University implemented the "Excellence System—a data-driven method that integrates nine competency areas throughout the curriculum of each major" to help define and assess the soft skills demanded by employers (Perkins, 2018). Bold

steps similar to these must be taken across the landscape of higher education if we hope to meet the growing demands from employers. Regardless of the approach taken, the assessment of soft skills should focus on proving a student's ability to apply the skills in workplace scenarios. Additional assessment tools to consider include portfolios, internship evaluations, and comprehensive soft skills rubrics.

The implementation and assessment of soft skills into the curriculum will require a commitment from faculty. Faculty may need to rethink their teaching methods and potentially shift from a traditional approach to one that actively engages students in a variety of practical soft skills lessons or lessons that incorporate both technical skills with soft skills. While this will certainly create additional burdens for faculty, Spisak (2015) argued that we must find a way to teach soft skills in our colleges instead of dismissing it simply because it is difficult to do.

One additional benefit to this study is that it allows the educational programs to determine if there is alignment between what the students and faculty perceive as important and what the students and faculty perceive to be included in the curriculum. A point of further investigation and conversation specific to the School of Design and Manufacturing used in this study should take place around the discrepancy between the perceived importance of ethics/professional morals by both students and faculty (ranked fourth and second, respectively) and the percentage of students (63%) and faculty (62%) that believe this skill is being taught within the program-specific courses. Based on the data, while the skill of ethics/professional morals is perceived as one of the most important skills to possess, it does not appear that it is incorporated into the curriculum at a substantial rate.

Recommendations for Further Research

      Future research should consider additional definitions and soft skill themes. As noted in the first chapter, there exist multiple definitions and themes association with soft skills. The definition used in this study—interpersonal skills associated with a person's personality, attitude, character, and ability to interact with others in a professional environment especially as it relates to skills such as communication, teamwork, collaboration, leadership, critical thinking, problem solving, creativity, and innovation—was an amalgamation of several researched-based definitions.

      As stated earlier, a possible limitation of this study is that the working definition used for the study included the word *interpersonal*, which does not encompass all soft skills. Future researchers may want to rethink including the word *interpersonal* in the definition of soft skills and instead rely on a more broadly accepted version of this definition.

      In this quantitative study, the sample and sample size limit the generalization of the study to other schools or institutions. As this study is replicated within additional schools, colleges, and universities, the generalizability of the study will grow. Replication of this study in different settings would provide further insight. To gain a broader understanding and comparison of the perception of soft skills between students and faculty, future research should aim to expand the focus and sample to include more academic programs. In addition, future researchers may want to consider alternative methods for connecting with faculty members (i.e., department meetings) to help increase the sample size of faculty participation.

CONCLUSION

The study provided illumination of the perceptions among students and faculty within the School of Design and Manufacturing relative to the importance of soft skills. Based on the analysis of the data, it is evident that both students and faculty believe that soft skills are essential skills for the advancement and success of students within both their education and career. The observation that both students and faculty listed the same five softs skills in their top five rankings (Table 5) indicates that there is a common rationality of the required skills among the program stakeholders.

While a discrepancy exists between the perceptions of students (48%) and faculty (23%) that believe a student's mastery of soft skills contributes to learning course/program outcomes, 92% of both students and faculty believe that the faculty within the School of Design and Manufacturing teach soft skills throughout the curriculum (Figure 13). Additionally, over 90% of students and faculty believe that the faculty within the School of Design and Manufacturing reinforce soft skills through career-focused activities (Figure 14) and provide students with the opportunity to practice and demonstrate soft skills within the program-specific courses (Figure 16).

Based on the data gathered through this study, it can be concluded that the students and faculty within the School of Design and Manufacturing believe that soft skills are important to a student's success and should be incorporated into the curriculum.

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APPENDIX A: STUDENT QUESTIONNAIRE

STUDENT QUESTIONNAIRE

I am a faculty member and also a doctoral student studying the perceptions of soft skills among students and faculty. This study will become part of my completed dissertation. To assist me in this process, I am asking that you please complete this questionnaire so that I am able to gain a better understanding of your perceptions of soft skills and the role that they play in your education and career.

Some questions will ask about your general belief regarding soft skills, while other questions will ask about the level in which soft skills have been incorporated into your college courses.

On average, it should take you less than 10 minutes to complete this questionnaire. Your participation is optional, and your identifying characteristics will remain confidential. Thank you for taking the time to complete this questionnaire.

If you have questions, please ask them before beginning the survey, or you may contact me later at _____ or email _____.

I was provided information about the study, and I consent to participate in the study of free will. By continuing, you are indicating your agreement/consent.

Definition of soft skills
The following questions are going to ask you about your perceptions of soft skills. I feel that it is important to begin with a baseline definition of what is meant by the term "soft skills". Soft skills can be defined as the interpersonal skills associated with a person's personality, attitude, character, and ability to interact with others in a professional environment especially as it relates to skills such as communication, teamwork, collaboration, leadership, critical thinking, problem solving, creativity, and innovation (Cotet, Balgiu, & Zaleschi, 2017; Robles, 2012; Stewart, Wall, & Marciniec, 2016).
I have read the definition and understand the term "soft skills."

1. As you think about the list of soft skills below, please rank them in order of importance from 1-10, where 1 is the most important and 10 is the least important.
   - Creativity/Innovation
   - Critical Thinking/Problem Solving
   - Ethics and Professional Morals
   - Flexibility /Adaptability
   - Leadership
   - Lifelong Learning
   - Multicultural and Diversity Understanding/Sensitivity
   - Teamwork/Collaboration
   - Verbal Communication Skills
   - Written Communication Skills

2. Based on your understanding of soft skills, to what extent do you believe they are important to be successful: (very important, important, moderately important, slightly important, not important)
   a. in your educational program?
   b. in your career?

3. To what extent do you believe mastery of soft skills contributes to: (not at all, somewhat, very likely)
   a. learning course/program outcomes
   b. Achieving higher grades
   c. Landing an internship
   d. Securing a job
   e. Earning a higher salary
   f. Maintaining employment
   g. Gaining advancement or promotion
   h. Better relationships with co-workers
   i. Being more productive at work

4. To what extent do you believe that the faculty within the School of Design and Manufacturing have done the following: (not at all, somewhat, very likely)
   a. Discussed the value soft skills
   b. Taught soft skills throughout the curriculum
   c. Reinforced soft skills through career focused activities (resume writing, interview preparation, etc.)

5. Which (if any) of the following learning opportunities did you experience in your courses/program (mark all that apply)?
   a. Experiential Learning
   b. Role Playing
   c. Group Work
   d. Case Studies
   e. Collaboration/Team Building Activities
   f. Writing
   g. Presentations
   h. Workplace Scenarios
   i. Other (please explain) _____

6. Do you feel that your instructors/professors have offered you the opportunity to practice and demonstrate soft skills within your program specific courses?
   a. Yes
   b. No
      i. If you marked yes (to question 6), which of the following soft skills do you feel you have learned through courses in your program (mark all that apply).

- Written Communication
- Verbal Communication
- Creativity/Innovation
- Critical Thinking/Problem Solving
- Leadership
- Ethics and Professional Morals
- Flexibility /Adaptability
- Lifelong Learning
- Multicultural and Diversity Understanding/Sensitivity
- Teamwork/Collaboration
- Other (please explain) _____

7. Do you believe that the School of Design and Manufacturing, as a whole, does a good job teaching students the soft skills they will need: (Yes, No)
   a. to be a successful student?
   b. to prepare you for an internship?
   c. To be successful in your career?

8. Do you believe that the faculty within the School of Design and Manufacturing should do more to incorporate soft skills into their courses?
   a. Yes
   b. No

9. Do you believe that [institution] and/or the School of Design and Manufacturing should offer some sort of credential for those meeting soft skill competency (i.e., digital badging, inclusion on academic transcript, etc.)?
   a. Yes
   b. No

10. Which of the following best reflects your program of study?
    a. Manufacturing
    b. Plastics
    c. Welding

11. Soft skills can be learned outside of the classroom as well. Where are some other places you feel that you have learned soft skills outside of the classroom (this can be in any aspect of your life)?

    (Open ended question)

APPENDIX B: FACULTY QUESTIONNAIRE

FACULTY QUESTIONNAIRE

I am a faculty member and also a doctoral student studying the perceptions of soft skills among students and faculty. This study will become part of my completed dissertation. To assist me in this process, I am asking that you please complete this questionnaire so that I am able to gain a better understanding of your perceptions of soft skills and the role that they play in your teaching.

Some questions will ask about your general belief regarding soft skills, while other questions will ask about the level in which you believe soft skills have been incorporated into your courses.

On average, it should take you less than 10 minutes to complete this questionnaire. Your participation is optional, and your identifying characteristics will remain confidential. Thank you for taking the time to complete this questionnaire.

If you have questions, please ask them before beginning the survey, or you may contact me later at _____ or email _____.

I was provided information about the study, and I consent to participate in the study of free will. By continuing, you are indicating your agreement/consent.

Definition of soft skills
The following questions are going to ask you about your perceptions of soft skills. I feel that it is important to begin with a baseline definition of what is meant by the term "soft skills". Soft skills can be defined as the interpersonal skills associated with a person's personality, attitude, character, and ability to interact with others in a professional environment especially as it relates to skills such as communication, teamwork, collaboration, leadership, critical thinking, problem solving, creativity, and innovation (Cotet, Balgiu, & Zaleschi, 2017; Robles, 2012; Stewart, Wall, & Marciniec, 2016).

I have read the definition and understand the term "soft skills".

1. As you think about the list of soft skills below, please rank them in order of importance from 1-10, where 1 is the most important and 10 is the least important.
   - Creativity/Innovation
   - Critical Thinking/Problem Solving
   - Ethics and Professional Morals
   - Flexibility /Adaptability
   - Leadership
   - Lifelong Learning
   - Multicultural and Diversity Understanding/Sensitivity
   - Teamwork/Collaboration

- Verbal Communication Skills
- Written Communication Skills

2. Based on your understanding of soft skills, to what extent do you believe they are important to be successful: (very important, important, moderately important, slightly important, not important)
    a. in a student's educational program?
    b. in a student's career?

3. To what extent do you believe mastery of soft skills contributes to a student: (not at all, somewhat, very likely)
    a. learning course/program outcomes
    b. achieving higher grades
    c. landing an internship
    d. securing a job
    e. earning a higher salary
    f. maintaining employment
    g. gaining advancement or promotion
    h. having better relationships with co-workers
    i. being more productive at work

4. To what extent do you believe you as a faculty member in the School of Design and Manufacturing have done the following: (very much, somewhat, not at all, somewhat)
    a. Discussed the value soft skills
    b. Taught soft skills throughout the curriculum
    c. Reinforced soft skills through career focused activities (resume writing, interview preparation, etc.)

5. Which (if any) of the following learning opportunities have you incorporated into your courses (mark all that apply)?
    a. Experiential Learning
    b. Role Playing
    c. Group Work
    d. Case Studies
    e. Collaboration/Team Building Activities
    f. Writing
    g. Presentations
    h. Workplace Scenarios
    i. Other (please explain) _____

6. Do you feel that you offer your students the opportunity to practice and demonstrate soft skills within your courses?
    a. Yes
    b. No

i. If you marked yes (to question 6), which of the following soft skills do you feel you have incorporated into your courses (mark all that apply).
- Written Communication
- Verbal Communication
- Creativity/Innovation
- Critical Thinking/Problem Solving
- Leadership
- Ethics and Professional Morals
- Flexibility /Adaptability
- Lifelong Learning
- Multicultural and Diversity Understanding/Sensitivity
- Teamwork/Collaboration
- Other (please explain) _____

7. Do you believe that the School of Design and Manufacturing, as a whole, does a good job teaching students the soft skills they will need: (Yes, No)
   a. to be a successful student?
   b. to prepare you for an internship?
   c. To be successful in your career?

8. Do you believe that the faculty within the School of Design and Manufacturing should do more to incorporate soft skills into their courses?
   a. Yes
   b. No

9. Do you believe that [institution] and/or the School of Design and Manufacturing should offer some sort of credential for those meeting soft skill competency (i.e., digital badging, inclusion on academic transcript, etc.)?
   a. Yes
   b. No

10. Which of the following best reflects the program you teach in?
    a. Manufacturing
    b. Plastics
    c. Welding

11. Do you **typically** teach 100/200 level courses, 300/400 level courses, or both?
    a. 100/200
    b. 300/400
    c. Both

APPENDIX C: IRB APPROVAL LETTER

FERRIS STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECT RESEARCH
1010 Campus Drive FLITE 410 Big Rapids, MI 49307 | (231) 591-2553 | www.ferris.edu/irb

Date: August 16, 2019

To: Susan DeCamillis, David McCall
From: Gregory Wellman, R.Ph, Ph.D, IRB Chair
Re: IRB Application *IRB-FY18-19-226 Perceptions of Soft Skills*

The Ferris State University Institutional Review Board (IRB) has reviewed your application for using human subjects in the study, *Perceptions of Soft Skills(IRB-FY18-19-226)* and approved this project under Federal Regulations Exempt Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).

The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

Your protocol has been assigned project number IRB-FY18-19-226. Approval mandates that you follow all University policy and procedures, in addition to applicable governmental regulations. Approval applies only to the activities described in the protocol submission; should revisions need to be made, all materials must be approved by the IRB prior to initiation. In addition, the IRB must be made aware of any serious and unexpected and/or unanticipated adverse events as well as complaints and non-compliance issues.

This project has been granted a waiver of consent documentation; signatures of participants need not be collected. Although not documented, informed consent is a process beginning with a description of the study and participant rights, with the assurance of participant understanding.

Informed consent must be provided, even when documentation is waived, and continue throughout the study via a dialogue between the researcher and research participant.

As mandated by Title 45 Code of Federal Regulations, Part 46 (45 CFR 46) the IRB requires submission of annual reviews during the life of the research project and a Final Report Form upon study completion. Thank you for your compliance with these guidelines and best wishes for a successful research endeavor. Please let us know if the IRB can be of any future assistance.

Regards,

Gregory Wellman, R.Ph, Ph.D, IRB Chair