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Luby, Andrew, S. *Effects of Moraine Park Technical College's Welding Bootcamp on Student Enrollment and Success*

Abstract

At the time of this study it was unclear why Moraine Park Technical College (MPTC) was experiencing a reduction in enrollment of the technical diploma welding program. At the same time there was an increase in enrollment in the welding bootcamp and a large need of welders from industry. This study was completed to determine why students were choosing the short-term welding training option as opposed to the technical diploma welding program. This study also served to determine if those skills taught in a short-term format would make students suitable for employment in local organizations. Extensive surveys were distributed to students and employers to ensure that the voices of these stakeholders were heard.

After reviewing the data, it was found that MPTC should continue to offer more short-term welding programs to allow students to graduate faster and move into the workforce at a quicker pace. By creating more directed, faster paced programs students could complete a program and enter the workforce in a much shorter time. With programs created around speed and useable skills MPTC would see an increase in welding enrollment and employer support.

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Chapter I: Introduction

The world of welding is one that few people know. However, the earliest recorded welds occurred in 3,500 B.C., this initial welding was a process called forge welding which utilized heat applied by a fire and pressure from a hammer to join metals. The next advancement in welding came in 1801 by Sir Humphrey Davy with the discovery of the electric arc (James F. Lincoln Arc Welding Foundation, 2000). This electric arc was not used to intentionally join metals until 1860 by an Englishman named Wilde. After this many inventors and scientists experimented with many variations of using an electric arc to join metals. Electric arc welding did not come to the U.S. until 1907 when the Siemund-Wiezell Electric Welding Company was formed (James F. Lincoln Arc Welding Foundation, 2000). Now more than 50% of U.S. products require welding (American Welding Society, 2019a). In 2016 there were 404,800 people employed in a welding field in the United States (Bureau of Labor Statistics, 2019a). Adding in the other job categories that require welding (e.g. ironworkers, boilermakers, and steamfitters) this number jumps to almost two million people employed in the welding trades. This job classification also has a job growth into 2026 of 6% (Bureau of Labor Statistics, 2019b) which is about average to other jobs. The American Welding Society (AWS) estimates that by 2020 there will be a shortage of welders exceeding 200,000 (American Welding Society, 2019b). In 2016, welding and manufacturing accounted for 12% of the United States gross domestic product (GDP) (Plaza, 2016). This makes welding a high demand field for anyone that is interested not only nationwide but in Wisconsin as well.

In Wisconsin, metal manufacturing accounted for \$59 billion dollars of revenue (National Association of Manufacturers, 2018). Wisconsin is also the fifth highest employer of welders in the country with an estimated 14,250 people employed in the field (Bureau of Labor Statistics,

2019a). The Moraine Park Technical College (MPTC) district in Wisconsin encompasses Fond du Lac, Dodge, and Washington counties. In Fond du Lac county there are 13,935 people employed in the manufacturing sector (U.S. Census Bureau, 2018a). The number of employed people in the manufacturing sector in Dodge county is 14,359 (U.S. Census Bureau, 2018b) and in Washington county this number is 16,958 (U.S. Census Bureau, 2018c). That means within the MPTC district there are a total of 45,252 people employed in the manufacturing field. Even with this focus of manufacturers in the MPTC district, the technical diploma program for welding has seen a decline in enrollment in recent years. In 2014 there was a total of 133 students enrolled in the welding technical diploma program and in 2017 there was a total of 79 students enrolled, a decline of almost 60% (MPTC Institutional Research, 2018). This decline has left the administration no choice but to cancel sections of classes on the separate campuses. With the low enrollment in a high demand field, MPTC believes that people are finding other routes to receive welding training such as enrolling at other schools or left in the hands of employers.

While there has been a steady decline in the technical diploma welding program, there has been an increase in enrollment and interest in the welding boot camp that MPTC offers (MPTC Institutional Research, 2018). The welding boot camp is operated by the Economic and Workforce Development department and is a short-term intensive training program that is operated separately from the program area. The courses consist of the same level courses as the technical diploma program providing transferable credits into the technical college system. The welding bootcamp is funded partly by grants issued by the State of Wisconsin and partly by employers, the only cost to students is a registration fee of \$30. This program caters and markets towards economically disadvantaged students who would normally not attend a school. The

success of the bootcamp has been attributed to the close partnership between MPTC and the employers. The bootcamp has given a second chance to students while providing another avenue of qualified employees for employers in a high demand field.

Problem Statement

It is unclear why there has been a decline in the technical diploma programs enrollment while there has been an increase in the welding boot camp's enrollment. While students completing the boot camp are being hired, it is unclear whether these students are trained to a competent level that will meet national standard needs or if their skills will meet the needs of local employers, that help them maintain employment effectively. This research will aid in determining if by offering more short-term welding education solutions, Moraine Park's enrollments would increase. No studies have been done on why students are now opting for the short-term training over the technical diploma.

Purpose of Study

The purpose of this study was to determine the effect of Moraine Park Technical College's welding boot camp on enrollment and student success. The study also served to determine whether the skills gained from short-term training meet a nationally recognized level, completers have a suitable skill set for local employers, and whether students feel they are prepared for employment as well as their peers who opted for the long-term program. Results of this study will help inform MPTC as to the variety of educational options, both long-term and short-term would be feasible and beneficial for the school and its stakeholders.

Objectives

To determine the feasibility of providing a short-term welding education program that is both supported by employers and students. The objectives of this study are:

1. To determine why students are choosing to enroll in the welding bootcamp.
2. To determine if short-term training completers are successful in maintaining employment in the field.
3. To determine if students who have completed the short-term training possess the skills employers need.

Significance

By completing this study, it may pave the way for the MPTC welding program to adopt into the program area, short-term fast paced learning modules. If successful, this could prove to increase student enrollment and employer support. Based on the information gained from this research MPTC, will be able to better serve the needs of its students and community partners. If this research finds one program style more successful over the other MPTC, can make better informed decisions on how to implement new program offerings.

Limitations

The limitations of this study are as follows:

1. The research will only reflect those students at MPTC's welding bootcamp. The structure of other "bootcamp" style welding programs may differ which may have an impact on success.
2. The research is confined to MPTC's district and therefore that district's employer consortium. The employers within MPTC's district have come to understand what the bootcamp is teaching and what students are capable of. Other "bootcamps" may not have the same employer pool or have the same employer expectations.

3. The research will be based on employment data for students of the 2015 - 2018 school year. Any unforeseen changes to the design of the bootcamp in the future may have an effect on outcomes.

Definition of Terms

The following terms and definitions are provided to be understand the content of this study.

American Welding Society (AWS). This is a nonprofit organization founded in 1919 with the purpose of advancing the sciences and technology of welding (American Welding Society, 2019c).

Entry level welder. Is an individual who possesses a specified amount of knowledge and skills to perform assessments at a regulated level. This regulated level is set and determined by AWS document EG 2.0 (AWS Committee on Education, 2008).

Gas metal arc welding (GMAW). Is a welding process where an electrode wire is continuously fed from an automatic feeder to the base metal, where a weld pool is created (Hoffman, Dahle, & Fisher, 2017, p. 75).

Gas tungsten arc welding (GTAW). Is a welding process that uses a non-consumable tungsten electrode to conduct welding current (Hoffman, Dahle, & Fisher, 2017, p. 168).

Short-term training. Is used for this study, for a term that refers to a 3month/15-week period. Specific to MPTC's welding bootcamp (MPTC EWD, 2019).

Welding bootcamp. At MPTC is a term for a fast-paced, intensive training program that is completed in a 15-week period (MPTC EWD, 2019).

Welding certification. Is a written document that states a welder has produced welds meeting prescribed standards (James F. Lincoln Arc Welding Foundation, 2000).

Chapter II: Literature Review

To better understand the key areas in which the study will be conducted it was important to conduct a literature review. The purpose of this study was to determine the effect of Moraine Park Technical College's welding boot camp on enrollment and student success. The study also served to determine whether the skills gained from short-term training meet a nationally recognized level, completers have a suitable skill set for local employers, and whether students feel they are prepared for employment as well as their peers who opted for the long-term program. Results of this study will help inform MPTC as to the variety of educational options, both long-term and short-term would be feasible and beneficial for the school and its stakeholders. Literature concerning MPTC's district, District Manufacturers, AWS Entry Level Welder Requirements, MPTC's Welding Technical diploma and MPTC Welding bootcamp will be reviewed to better understand these areas of the study.

During the literature research process many outlets of information were accessed but no search efforts resulted in finding any similar studies being done in the past. The literature presented here develops a much better understanding of the community involved in this research. This literature also provides an image of what national standards describe what knowledge and skills an entry level welder should have.

Moraine Park Technical College's District

The Moraine Park district is one of 16 of Wisconsin's technical college districts. Located on the east side of Wisconsin the district is mostly made up of Dodge, Fond du Lac, and Washington counties as shown in figure 1, the MPTC district also consists of small portions of surrounding counties as well.

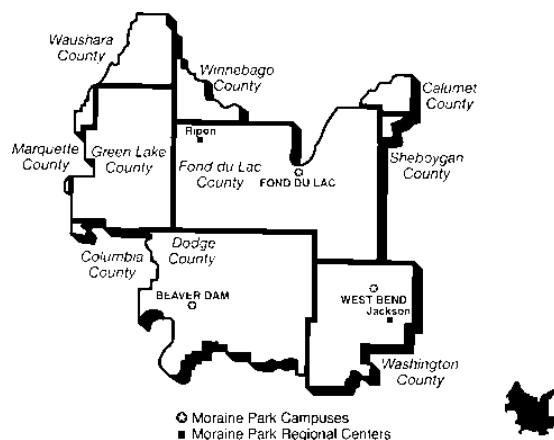


Figure 1. Image of MPTC's district.

According to the U.S. Census done in 2000, Dodge county had a population of age 16 and above of 67,223 and of that population 43,197 were employed. The largest employment category in Dodge county is manufacturing with a total of 14,359 people employed, or 33.2% of the employable population is working in a manufacturing sector (U.S Census Bureau, 2018a). In Dodge county alone, there are 137 manufacturing facilities (U.S. Census Bureau, 2016b).

According to the U.S. Census done in 2013 Washington County had a population of 107,370 and of that population 76,142 people were employed. The largest employment category in Washington county is again manufacturing with 16,958 people employed, or 23.1% of the employable population is employed in the manufacturing sector (U.S. Census Bureau, 2018b). This employment takes place in 321 manufacturing businesses in Washington county (U.S. Census Bureau, 2016c). Finally, in Fond du Lac county there is a population of 16 and over of 76,009 with 53,717 of those people being employed. The largest employment sector in Fond du Lac county is again, manufacturing with 13,935 people employed, or 27.1% of the employable population is working in manufacturing (U.S. Census Bureau, 2018c). In Fond du Lac county the manufacturing employers are made up of 145 different establishments (U.S. Census Bureau,

2016a). This means that in the Moraine Park district there is a total population of 173,056 of working adults with 45,252 working at 569 different manufacturing businesses. The data shows that close to 26% of employable people in Moraine Park's district work in manufacturing. Currently, there are 429 job postings for welders within the MPTC district, with some postings filling more than one position (www.indeed.com, 2019).

American Welding Society Entry Level Welder Requirements

The American Welding Society (AWS) has developed criteria and guidelines that define what an entry level welder is and what job duties they should be able to perform. This definition and requirements can be found in their published document "EG2.0:2006, Guide for the Training of Welding Personnel: Level I – Entry Welder". The definition of an entry level welder is; an individual who possesses a prerequisite amount of knowledge, attitude, skills and habits to perform routine and predictable work under close supervision (AWS Committee on Education, 2008). The purpose of this document is to provide training organizations with a list of key indicators along with establishing a national consensus of guidelines for entry level welders (AWS Committee on Education, 2008). This document identifies that an entry level welder should possess knowledge and show motor skills in: welding safety, blueprint reading, Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW), Gas Tungsten Arc Welding (GTAW) and thermal cutting processes. Within each of those topic areas there are numerous key indicators of how an individual shows mastery of that skill. It is suggested that these requirements can be met by using a traditional comprehensive program covering all topics or they can be broken up into various modules for learning. These requirements as described by the AWS is a comprehensive list of skills and knowledge. In addition, even though a person goes through this extensive training they must by definition,

“work under close supervision” (AWS Committee on Education, 2008, p. 2). The requirements defined by the AWS still require on-the-job training/mentoring.

Comparison of MPTC’s Program Offerings for Welding

Moraine Park Technical College provides different options for the diverse student population it serves. These options for a welding career or welding related career include the short-term Welding bootcamp, a Welding technical diploma, a Metal Fabrication technical diploma, and an Associates in Fabrication Technologies (Moraine Park Technical College, 2019a). For the purpose of this study the welding bootcamp and the welding technical diploma will be the focus of review.

The MPTC welding technical diploma is a 29 credit one-year comprehensive program, “teaches individuals the welding and fabrication skills needed in today’s industries.” (Moraine Park Technical College, 2019b). This program includes course work in GMAW, GTAW, SMAW, FCAW, and cutting processes. There is also other institutional required course such as a mathematics course, a communications course, computer literacy and college 101. To complete all of these courses in one year it would take a student to be enrolled at a full-time status. The approximate costs for this program are \$134.20 per credit for residents, this total is in addition to approximately \$1,000 for additional tools and equipment needed. The total cost of tuition and tools are able to be funded by financial aid along with scholarships provided by local employers.

In comparison the welding bootcamp that is operated by the economic and workforce development team at MPTC is a Three month/ 15-week program, “provides students with the skills employers seek.” (MPTC EWD, 2019). The courses in the bootcamp are the same course work as the technical diploma program however, there are fewer courses scheduled at a much

faster pace. The welding bootcamp is a total of 14 credits with coursework in GMAW, GTAW, print reading, Mathematics and Team Building and Problem Solving. The final course students are required to take is the Welding Internship, this course takes place at one of the business partners EWD works closely with and is 144 hours of working time. (MPTC EWD, 2019). The cost of the bootcamp is free for students except for the \$30 registration fee. The bootcamps are funded by State grants along with employers funding a portion. Once students complete, they receive an Entry Level Welding Certificate.

Short-Term Credentials

In 2009 President Obama announced a \$12 billion initiative to increase assistance to community colleges (Jespen, Troske, & Coomes, 2014). This announcement was provided affirmation that the administration believed in the nation's community colleges. In 2010 the number of short-term certificates awarded increased 151% from 2000 (Dadgar & Trimble, 2015). According to (Dadgar & Trimble, 2015) short-term certificates were a large part of this increase, increasing from 16% to 25% in a decade. Nationally, short-term certificates are primarily awarded in technical programs and typically require one or two semesters to complete (Jespen, Troske, & Coomes, 2014). Typically, these program areas include medical coding, IT, and some leadership course work. After a certificate there are technical diplomas, associates, bachelors and beyond. Each degree level has historically been associated with a certain expected level of return financially.

Early studies show that for each year of education past high school provides a return of a 5% to 10% increase in yearly wages (Belfield & Bailey, 2011). According to a study by Jespen, Troske, & Coomes, 2014, associates degrees resulted in an increase of nearly 56% for women and 24% for men. This same study found that diplomas resulted in a 45% increase for women

and 21% for men. Finally, they also found that certificates, which require the least amount of work and time commitment resulted in only a 7% increase for women and 5% increase for men. This study by Jespen et al. 2014 shows that there is a distinct return on effort and time of schooling beyond high school. Although short-term certificates provide the lowest return the amount of awarded certificates nationally increased 9% in ten years.

The added benefits to short-term certificates go beyond potential earning gains. The Wisconsin technical college system produces a large number of short-term certificates (Bosworth, 2010). In 2009 that state of Wisconsin surveyed graduates of various programs. It was found that the median salary for an associate degree was reported as \$36,000; and short-term certificates had a median salary of \$24,958 (Bosworth, 2010). However, these findings did not include that many of the short-term certificate holders reported a higher salary than their peers who opted for an associate degree in similar fields. This phenomenon could be because of the short-term certificate completers would have more experience due to more time on the job as compared to the associate degree completers (Bosworth, 2010).

Chapter III: Methods and Procedures

The purpose of this study was to determine the effect of Moraine Park Technical College's welding boot camp on enrollment and student success. The study also served to determine whether the skills gained from short-term training meet a nationally recognized level, completers have a suitable skill set for local employers, and whether students feel they are prepared for employment as well as their peers who opted for the long-term program. Results of this study will help inform MPTC as to the variety of educational options, both long-term and short-term would be feasible and beneficial for the school and its stakeholders.

Within this section the research design, sample selection, instrumentation, data analysis and the research limitations are discussed in detail. Understanding these features of the study may help other researchers to replicate the study.

Research Design

A cross-sectional research design (Jurs & Wiersma, 2009) was used, utilizing a survey that measured a phenomenon at one specific time. The first group was the employers of MPTC's welding students, and the second group were the welding students themselves. This design provided the researcher with quantitative data to better analyze the study problem. The survey was designed to collect data based on a standard Likert scale. This type of survey gave respondents the opportunity to provide quantitative data while still having the ability to give affective thoughts. Using a survey also allowed the researcher to reach a larger sample of students, since this study is dependent on graduates. Employers were reached via a survey distributed with Qualtrics as well. Employers were given the opportunity to provide qualitative data along with quantitative with the use of open-ended items (Jurs & Wiersma, 2009). This

survey design allowed employers more freedom in their responses because their true feelings would not be forthcoming with standard forced selection questions (Jurs & Wiersma, 2009).

Sample Selection

The participants that were selected for the employer sample were local employers who hire Moraine Park technical diploma welding students along with Moraine Park welding bootcamp students. This selection is done to ensure there is a comparison in knowledge learned between the two programs. The requirement of hiring both types of students narrowed the sample size down to eight organizations.

This research was completed using students that had successfully completed either of the welding programs between the years of 2015 and 2018. This three-year span will include graduates of the welding bootcamp along with graduates of the welding technical diploma program. To ensure the validity of this population as suggested by (Gall, Gall, & Borg, 2007), random graduates were selected from the population of either welding bootcamp students or welding technical diploma program students.

Instrumentation

The data from the employer survey covered the skills that their particular company found to be the key to the success of an entry level welder. The topics included what particular technical skills were most important, what soft skills they found to be important, if they recognized national standards, and what skills students from the different programs displayed particularly well. A copy of the employer survey can be found in appendix A. The student survey included questions about why they chose the program they did and how well prepared they felt in the workplace. The questions asked about the particular technical skills they needed for their employer, what soft skills they learned that helped them the most, if they were operating

under national standards, and what skills they possessed that they felt particularly confident in performing. Overall these questions were used to gauge how effective the students felt the programs were and if they felt they were prepared for the workforce. To ensure the reliability of the surveys used they were first reviewed by the researcher's colleagues that are familiar with the program. The survey questions were reviewed to ensure that the intended outcome would be reached. Once the surveys were reviewed a small pilot group was surveyed as suggested by (Gall, Gall, & Borg, 2007). These instruments were designed for the purposes of this study only. The student surveys were then followed up by interviews if it was felt that clarifying questions were needed. A copy of the student survey can be found in appendix B

Data Collection Procedures

Data was collected from the employer group using a survey developed and distributed using Qualtrics (Appendix A). The use of this tool allowed the researcher to send surveys to multiple employers within the MPTC district at one time. All responses were anonymous and no identifiable information was collected. This gave all respondents the assurance that their responses would not correlate with their personal views of the college. The survey for employers consisted of 10 questions that allowed the researcher to gather data about the type of work that is expected of a welder in their facility along with their experiences with students from both the welding technical diploma program and welding bootcamp. Respondents were informed of their implied consent along with their option to not participate in the study.

To collect the data for the student surveys, the researcher obtained the class list from the MPTC institutional effectiveness department for the years identified in the study. The corresponding list provided contact information for all of the students in the selected sample. Surveys were then emailed to all students using the third-party solution Qualtrics via email

(Appendix B). All surveys were sent with the human research subject consent form attached so all students were notified that their participation was voluntary. Subjects were notified that there were no identifying questions asked and all responses would remain anonymous.

Data Analysis

The data received from the employer surveys was a mix of both quantitative and qualitative responses. This style was preferred for the employer's survey, so they could provide a much better narrative of what they, as an organization found to be important and key to their employee's success. Once the qualitative data was collected the information was first categorized and then coded to identify specific themes in the responses (Gall, Gall, & Borg, 2007). An interpretational analysis was used to find themes that can be used to explain the phenomenon being studied (Gall, Gall, & Borg, 2007). The employer's quantitative data was processed and analyzed using the tools provided by Qualtrics. These tools allowed the researcher to quickly and effectively see trends in responses.

Quantitative data was collected for the students in this study by using surveys, the survey data was then tabulated and analyzed using tools provided by Qualtrics. The surveys consisted of 12 questions that revolved around the stated problem questions. The topics covered in the survey included: how well the students felt prepared for the workplace, a self-assessment of how much of their learned skills they use, if their workplace abides by national standards, and why they chose the program they did.

Limitations

The following are limitations of the study. This research only applies to the employers in the Moraine Park district with an emphasis on those who have hired students from the welding technical diploma program and the welding bootcamp. This research also only applies to the

welding technical diploma program and welding bootcamp at Moraine Park Technical College. The curriculum at other schools may include other skills not obtained at MPTC. Lastly, this research only applies to those students who had completed one of the welding programs between the years of 2015 and 2018.

Summary

The data collected during this study provided an insight into the needs of students and employers. This style of data collection provided the researcher with information on the affective thoughts of students and employers that gave the organization the ability to truly hear the voice of the customer. The following chapters will provide an insight into the views of the welding program options at MPTC. These views go beyond the standard quantitative data that is normally collected providing the organization with reliable data that can be used to make changes to the programs as requested.

Chapter IV: Results

The purpose of this study was to determine the effect of Moraine Park Technical College's welding boot camp on enrollment and student success. The study also served to determine whether the skills gained from short-term training meet a nationally recognized level, completers have a suitable skill set for local employers, and whether students feel they are prepared for employment as well as their peers who opted for the long-term program. Results of this study will help inform MPTC as to the variety of educational options, both long-term and short-term would be feasible and beneficial for the school and its stakeholders.

In the initial parts of this study employers were sent a survey so they could provide their input on different aspects of the programs and the students coming from them, a total of nine employers were identified with a total of eight responding, resulting in an 89% response rate. It was important to this study to hear from employers who have employed or currently employ students from both programs. The results of these surveys from the employers were analyzed using a coding system since this was mainly qualitative data the responses had to be categorized so the researcher could look for trends in the responses.

Employer Surveys

The first question on the employer survey was to determine how many of MPTC's students they currently employ. From the six respondents it was determined that the majority of employers currently have on staff between six and nine MPTC welding graduates, this is reflected in table one.

Table 1

Current MPTC Graduates Employed by Employers

Response	Frequency	Percentage
0-5	2	33.33%
6-9	4	66.67%
10-14	0	0%
15 or more	0	0%

The second question aimed to determine what the primary job duties of a welder in their facility was. The nine employers that were surveyed are similar in the nature of their primary business, metal fabrication. Beyond this similarity each employer has their own customers that they supply with unique requirements. The six responses that were received were analyzed for a typical theme or trend. Five respondents or 80% stated that the use of the GMAW welding process was a requirement. Two respondents or 33% stated that the use of the GTAW welding process was a requirement. Although minimally there was also mention of the use of tooling and fixtures along with hand tools.

The third question asked employers if they recognize and use AWS standards in their everyday business. This question had five responses which means one employer had decided not to answer this particular question. This question asked employers to rate their use on a standard Likert scale, the results can be seen in table two.

Table 2

Current use of AWS Standards

Response	Frequency	Percentage
Always	2	40
Very Often	2	40
Sometimes	0	0
Rarely	1	20
Never	0	0

The fourth question asked employers if they were familiar with the AWS official definition of what an entry level welder was, six respondents answered this question. Employers were asked to rate their knowledge of the AWS definition on a standard Likert scale. The results of these responses can be seen in table three. This question resulted in 83% of employers admitting that they were not very familiar with what the actual definition is. One employer admitted they do know the definition in a moderate nature.

Table 3

Current Knowledge of the AWS Definition of Entry Level Welder

Response	Frequency	Percentage
Not at all Familiar	1	16.67%
Slightly Familiar	2	33.33%
Somewhat Familiar	2	33.33%
Moderately Familiar	1	16.67%
Extremely Familiar	0	0%

The fifth question returned to a qualitative data set that allowed employers to tell us in their own words what technical skills were the most important to the success of a welder in their organization. This question had a 100% response rate and all answers are similar to the second question asking about primary job duties. This data identifies a direct correlation to primary job duties and the success of a welder at these organizations. From the six responses five employers or 83% have identified the GMAW welding process as a technical skill for employees to be successful. Two employers or 33.33% have identified the GTAW welding process as a technical skill needed. One employer had identified the use of measuring tools and other hand tools as a needed technical skill. Another employer identified knowledge beyond the physical welding of a part but stated the identification of acceptable and unacceptable welds as a technical skill that leads to success in their organization.

The sixth question asked a similar question but referred to the soft skills that employers find as the most important for the success of a welder. This question had a 100% response rate. Of the six responses received all six employers identified attendance as an important soft skill to the success of a welder. Second to attendance was communication which three or 50% of employers identified as an important skill. Finally, there were individual responses of, problem solving, a willingness to learn from others, and working safely as well.

The seventh question asked employers to describe any gaps of skill, both technical and soft between bootcamp students and technical diploma students. This question had six responses from employers with two choosing not to respond. Many of the employers stated that they have had good experiences with bootcamp students. One employer stated that bootcamp students lack skill welding aluminum materials. Four or 67% of employers stated that boot camp students do tend to have a better attendance record within their organizations. One employer stated

bootcamp students have better problem-solving skills than their peers from the technical diploma program.

The final two questions on the survey asked employers to rate their overall experience with the technical diploma graduates and bootcamp completers from MPTC. Both of these questions had a total of six employers responding for a 75% response rate. The results can be seen below in table four and table five.

Table 4

Overall Employer Experience with MPTC Technical Diploma Graduates

Response	Frequency	Percentage
Completely dissatisfied	0	0%
Mostly dissatisfied	0	0%
Somewhat dissatisfied	0	0%
Neither satisfied or dissatisfied	2	33.33%
Somewhat satisfied	3	50.00%
Mostly satisfied	1	16.67%
Completely satisfied	0	0%

Table 5

Overall Employer Experience with MPTC Welding Bootcamp Completers

Response	Frequency	Percentage
Completely dissatisfied	0	0%
Mostly dissatisfied	0	0%
Somewhat dissatisfied	0	0%
Neither satisfied or dissatisfied	0	0%
Somewhat satisfied	1	16.67%
Mostly satisfied	5	83.33%
Completely satisfied	0	0%

Student Survey

The second part of this study required that students of both the technical diploma and bootcamp programs provide feedback on why they chose the program they did, if their skills are being used, and if they felt prepared for the work place. The students that participated in the survey were selected because they had completed either the welding technical diploma or the welding bootcamp between the years of 2015 and 2018. This sample resulted in 400 students being sent online surveys to complete. There was a total of 41 respondents which is a response rate of 10.25%. To meet the objectives of this study students were asked a series of questions that allowed them to provide feedback about why they chose the program they did, and if they are employed and felt prepared for the workplace. The researcher also asked questions about the use of their learned skills to help develop a narrative about how employers view their skill set. All of the questions on the student survey resulted in qualitative data that has been processed and analyzed using tools with in the Qualtrics survey system. The results are as follows.

Question one and question two first allowed students to identify which program they had completed in the specific time frame. Question one which asked students, *did you complete the welding technical diploma between the years of 2015 and 2018?* Had a total of 47 (100%) respondents. There was a total of 31 (66%) students that stated they were graduates of the technical diploma program. Question two which asked students, *did you complete the welding bootcamp between the years of 2015 and 2018?* Had a total of 47 (100%) respondents. There was a total of 30 (64%) students that stated they were graduates of the welding bootcamp. Figure two is a representation of these two questions.

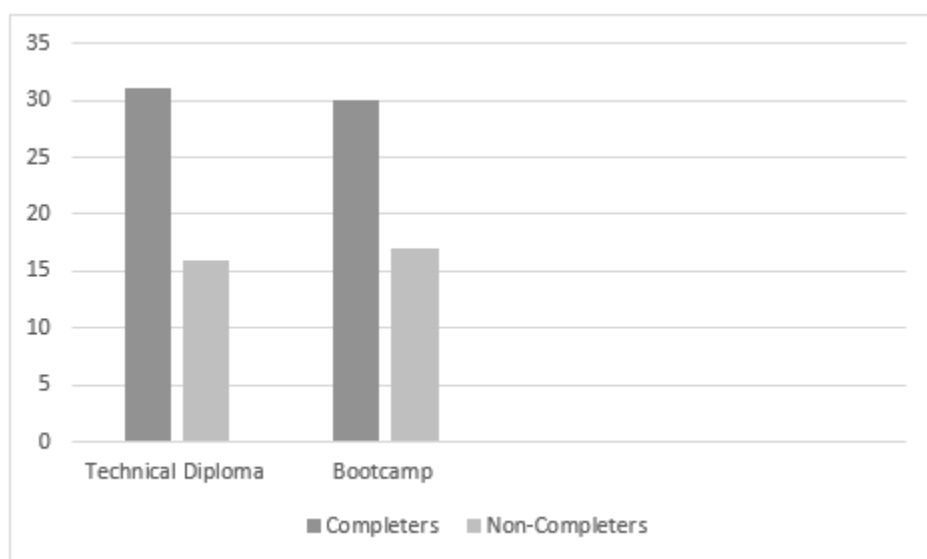


Figure 2. Technical diploma and bootcamp completers.

Question three asked students why they chose the specific program they did. This question had a total of 47 (100%) respondents. The results show that more students chose the program they did because of the skills that were to be learned. A total of 30 (64%) of students stated this was the reason they enrolled in their program. Figure three is a graphical representation of all responses.

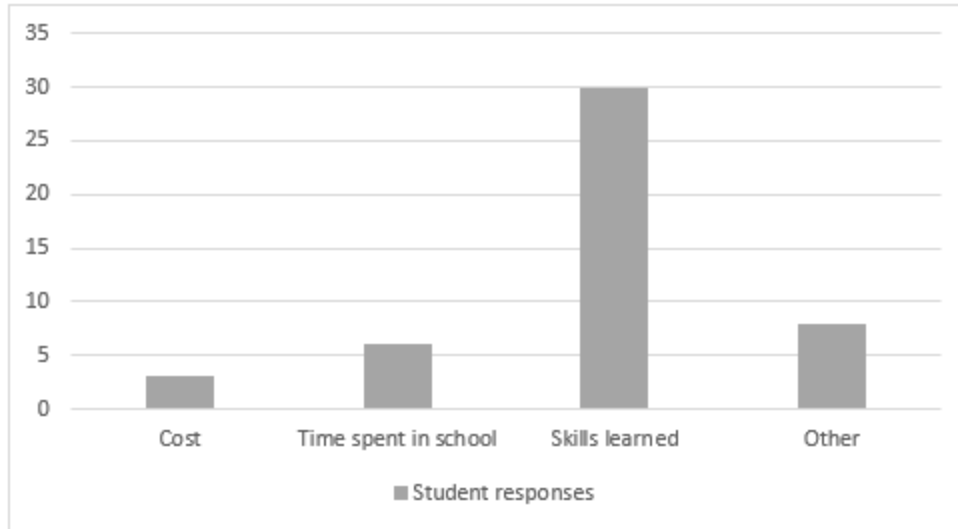


Figure 3. Reasons students chose a welding program.

Question four asked students, *do you currently work in the field of manufacturing or welding?* There was a total of 47 (100%) respondents. The majority of students still work in the field of manufacturing or welding with a total of 40 (85%) answering yes. The second objective of this study is to: determine if short-term training completers are successful in maintaining employment in the field. In order to do that the data must be separated and analyzed. Once this done the researcher can then determine how many bootcamp students are employed in the field. Figure four is a graphical representation of this data.

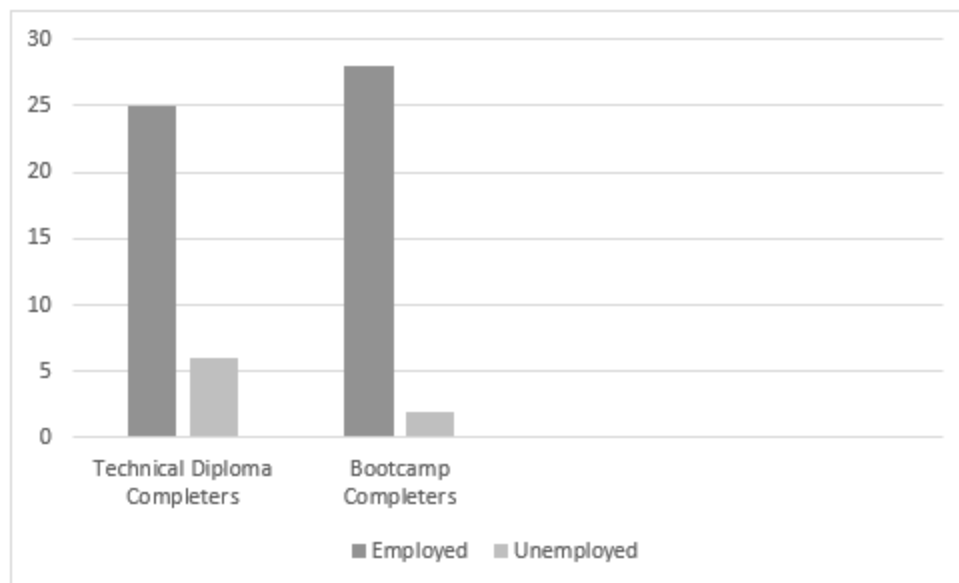


Figure 4. Number of students employed in the field per program.

The next series of questions allowed students to provide feedback on how often they use the skills they learned at school. The questions ask them to think about their typical workday and rate on a standard Likert scale how often they use that skill. The skills listed are the different welding processes taught at MPTC along with blueprint reading. Table six is a representation of these results.

Table 6

How Often Students use Skills at Work

Response	GMAW	GTAW	SMAW	FCAW	Blueprint
Never	5	8	33	24	4
Rarely	1	6	2	6	1
Sometimes	11	15	3	6	4
Often	14	7	2	4	23
Always	10	5	1	1	9

Question ten asked students to rate on a scale the usefulness of the soft skills they learned at school in the workplace. A total of 45 (96%) students answered this question. The majority of students answered that they agreed the soft skills they learned were useful in the workplace. A total of 25 (56%) students agreed their soft skills were useful. Figure five is a graphical representation of the results.

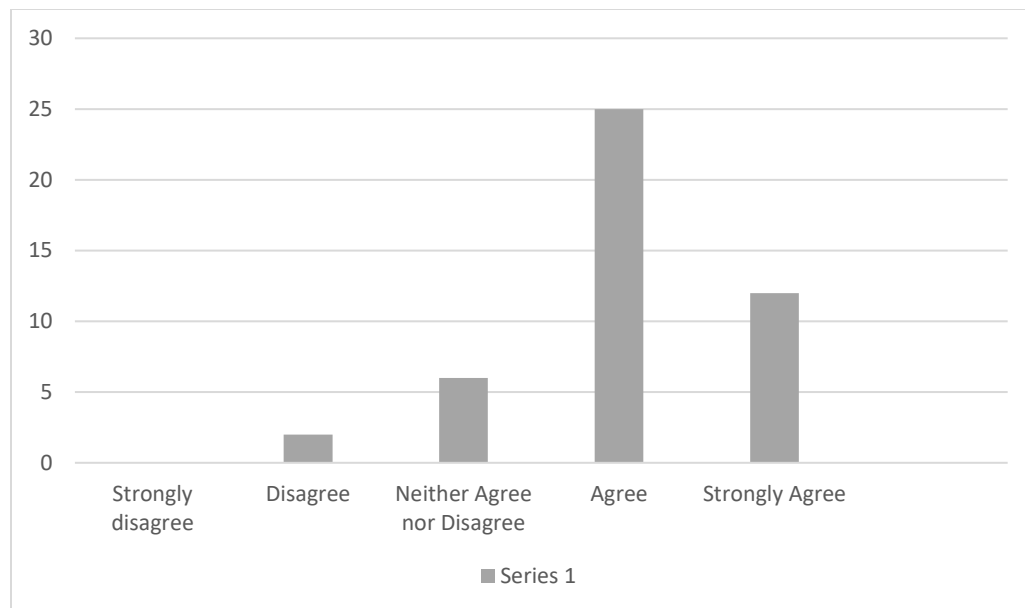


Figure 5. Soft skills usefulness in the workplace.

The final question asked students, *After completion of your program. Did you feel prepared for employment in manufacturing?* This question had a total of 47 (100%) respondents. Overall, the students felt that they were prepared for the workplace, there were 41 (87%) respondents that said yes to this question. Table seven is a representation of these results.

Table 7

Students Preparedness for Work After Graduation

Response	Frequency	Percentage
Yes	41	87.23%
Neutral	3	6.38%
No	3	6.38%

Research Objectives

The purpose of this study was to determine if MPTC's offering a short-term training program may increase student enrollment. The study also served to determine whether the skills gained from short-term training meet a nationally recognized level, completers are suitable for local employers, and whether students maintained employment as well as their peers who opted for the long-term program. The results of the individual questions preceded this page. The results of the individual research objectives will be discussed here.

Research objective one: Determine why students are choosing to enroll in the welding bootcamp. To determine why students are choosing the program they did the researcher had to look at the third question of the student survey. There was a total of 47 (100%) respondents to that question with a total of 30 (64%) stating that the skills learned in school was their primary reason for joining the program they did. This however does not tell us why students have chosen the bootcamp over the technical diploma program. To do this the researcher looked at the relation between the answers for the question and the answers for the question about what program students had completed. Figure six is a graphical representation of this data.

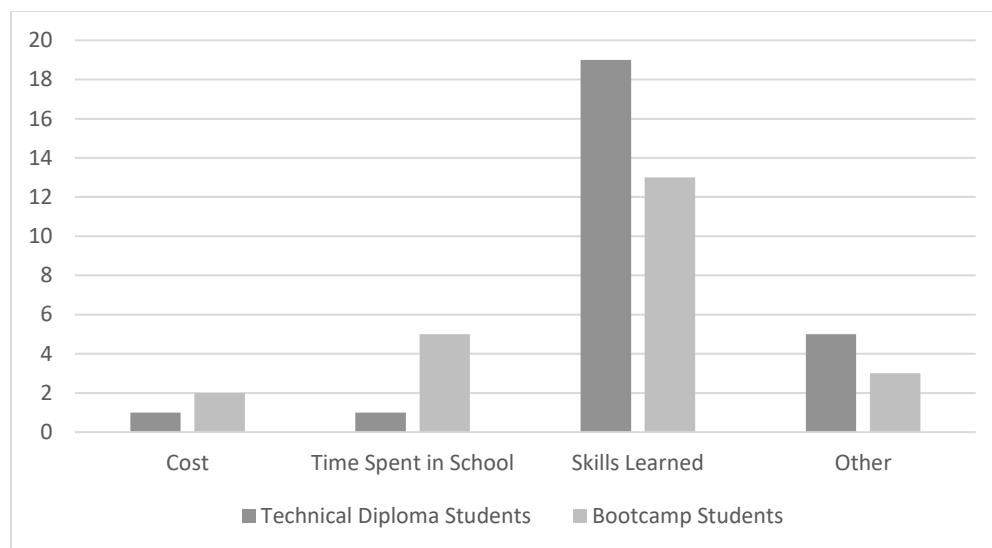


Figure 6. Reasons students chose their program.

Research objective two: Determine if short-term training completers are successful in maintaining employment in the field. To determine if the students from the short-term training are as successful in maintaining employment the researcher had to look at two questions from the student's survey. The fourth question asked students if they were currently working in the field, from the 47 respondents 40 (85%) had indicated that they were currently working in the field. However, this doesn't not consider the different programs. To do this the researcher had to identify positive answers to the question based on the program students indicated they had completed. Figure seven is a graphical representation of the students that indicated they were currently working in the field and the program they completed.

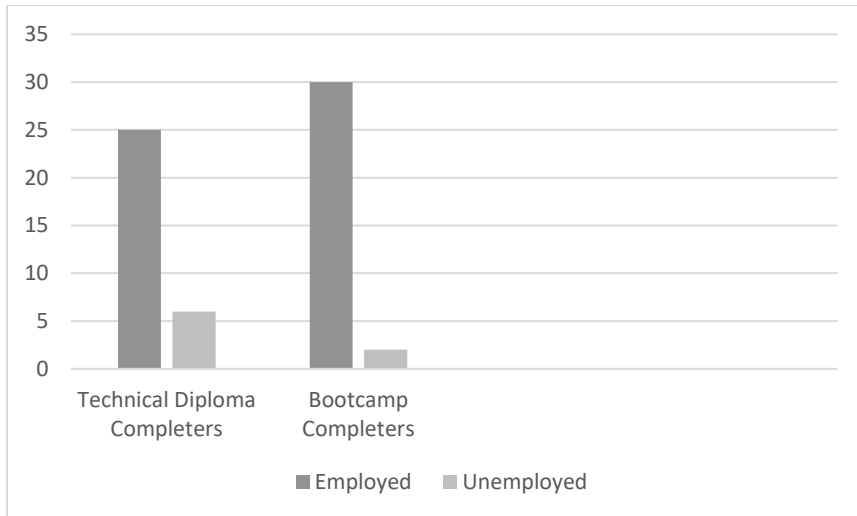


Figure 7. Employed and unemployed students per program.

The second question to consider in this scenario is the question asking students if they felt prepared to enter the workforce after completing their program. Students indicated if they felt prepared for the workplace in question nine of the survey. Overall results indicate that the majority of students felt prepared. This however, does not describe the results per program.

Figure eight is a graphical representation of student responses per program.

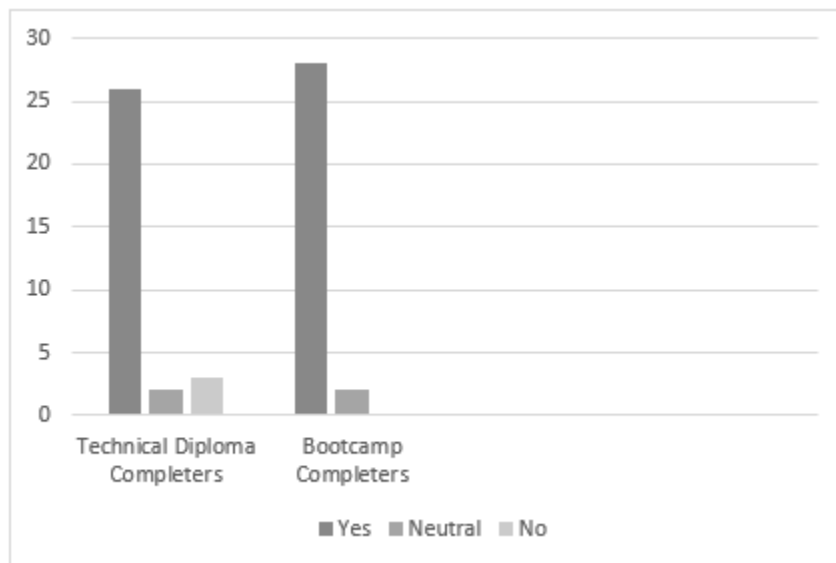


Figure 8. Student preparedness for the workforce per program.

Research objective three: Determine if students who have completed the short-term training possess the skills employers need. To determine if students possess the skills that employers want it is important to look at the information they had provided in a series of questions. The employer survey asked employers what the primary job duties of a welder in their facility were. Only one employer had mentioned that welding to a specified code is important. Many other employers responded that they use AWS codes and specifications however, only one identified it as a primary job duty. The responses were then analyzed, and themes were identified. The themes from this question are represented in table eight.

Table 8

Themes of Employer Responses Concerning Primary Welder Duties

GMAW welding
GTAW welding
Safe work practices
Welding of different materials

The researcher also asked employers if they had identified any gaps in skill between the technical diploma completers and bootcamp completers. This question was a narrative type of question that allowed employers to respond in their own words. Attendance was the largest gap that was identified, behind that was the transition into the workplace with two employers identifying that as a gap. These responses were analyzed and then themes were identified. Table nine is a representation of those themes.

Table 9

Gaps in Skill per Program Completers

Bootcamp completers have better attendance.

Bootcamp students transition to work easier.

Bootcamp students lack aluminum welding skill.

Finally, employers were asked to rate their overall experience with students from each program. This dissatisfaction in this question would identify a lack of skills, either soft or technical. A total of six employers responded to these two questions. These questions ask employers to rate their satisfaction on a standard Likert scale, this qualitative data was then analyzed and recorded. Figure nine is a graphical representation of employer satisfaction per type of program student.

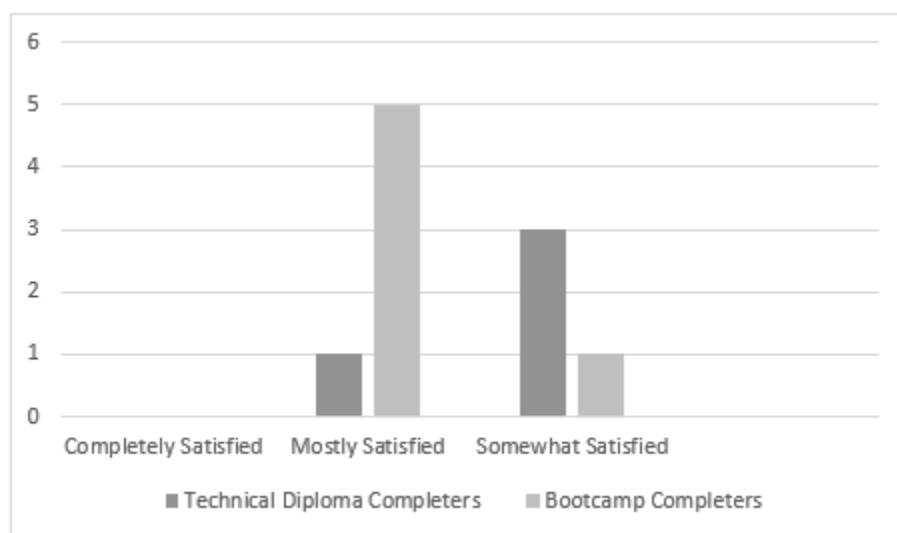


Figure 9. Employer satisfaction of students per program. Note: Only the responses above the neutral choice have been depicted here.

Chapter V: Discussion, Conclusion and Recommendation

The purpose of this study was to determine the effect of Moraine Park Technical College's welding boot camp on enrollment and student success. The study also served to determine whether the skills gained from short-term training meet a nationally recognized level, completers have a suitable skill set for local employers, and whether students feel they are prepared for employment as well as their peers who opted for the long-term program. Results of this study will help inform MPTC as to the variety of educational options, both long-term and short-term would be feasible and beneficial for the school and its stakeholders.

Restatement of the Problem

It is unclear why there has been a decline in the technical diploma programs enrollment while there has been an increase in the welding boot camp's enrollment. While students completing the boot camp are being hired, it is unclear whether these students are trained to a competent level that will meet national standard needs or local employer needs that help them maintain employment effectively. No studies have been done on why students are now opting for the short-term training over the technical diploma.

Restatement of the Limitations of the Study

The limitations of this study are as follows:

1. The research will only reflect those students at MPTC's welding bootcamp. The structure of other "bootcamp" style welding programs may differ which may have an impact on success.
2. The research is confined to MPTC's district and therefore that district's employer consortium. The employers within MPTC's district have come to understand what

- the bootcamp is teaching and what students are capable of. Other “bootcamps” may not have the same employer pool or have the same employer expectations.
3. The research will be based on employment data for students of the 2015 - 2018 school year. Any unforeseen changes to the design of the bootcamp in the future may have an effect on outcomes.

Methods and Procedures

A cross-sectional research design (Jurs & Wiersma, 2009) was used, utilizing a survey that measured a phenomenon at one specific time. The first group was the employers of MPTC’s welding students, and the second group were the welding students themselves. This design provided the researcher with quantitative data to better analyze the study problem. The survey was designed to collect data based on a standard Likert scale. This type of survey gave respondents the opportunity to provide quantitative data while still having the ability to give affective thoughts. Using a survey also allowed the researcher to reach a larger sample of students, since this study is dependent on graduates. Employers were reached via a survey distributed with Qualtrics as well. Employers were given the opportunity to provide qualitative data along with quantitative with the use of open-ended items (Jurs & Wiersma, 2009). This survey design allowed employers more freedom in their responses because their true feelings would not be forthcoming with standard forced selection questions (Jurs & Wiersma, 2009).

Major Findings

Major findings for the research objective one: *To determine why students are choosing to enroll in the welding bootcamp.* Revealed the following; 1) the majority of students regardless of program chose their program because of the welding skills they would learn; 2) Bootcamp

students chose the program for the skills they would learn; 3) only three of the students that responded chose the bootcamp because of the cost.

Major findings for the research objective two: *To determine if short-term training completers are successful in maintaining employment in the field.* Revealed the following; 1) the majority of students that responded are employed in their field of study; 2) there are less bootcamp students not employed in the field; 3) although relatively small, there are more bootcamp students employed in their field of study than compared to technical diploma students.

Major findings for the research objective three: *To determine if students who have completed the short-term training possess the skills employers need.* Revealed the following; 1) overall employers are satisfied with students from both programs; 2) bootcamp students tend to have a better soft skill set than their peers 3) employers indicated what the primary job duties of a welder was and then identified no gaps in technical skill for bootcamp students.

Conclusions

Based on the information that was gather and presented it can be concluded that the bootcamps being free for students is not a deciding factor for students choosing their program. Students are choosing their program based on the skills they learn. This means that the welding students coming to MPTC want to be welders and they want the skills that go with being a welder regardless of the time it takes, and the cost associated with the program. The question in the student survey asked what the primary reason for choosing the program was, leaving out any secondary items that may have helped in their decision making process.

The second research objective was to determine if students who opted for the short-term bootcamp could maintain employment as well as their peers. It was thought that with a limited skill set this may prove to limit their employability. Based on the information collected there

was a small difference in the two program areas. The more students that indicated they completed the bootcamp also indicated that they were currently working in the field than their peers. However, this does not consider the students that first completed the bootcamp then transferred to the technical diploma program. What can be concluded is that MPTC welding students are being hired and can maintain that employment regardless of the length of time in school.

The final research objective was to determine if short-term training was able to provide students with enough skill and knowledge to be employable by local organizations. The information to determine this was collected from the employer group. Based on this information it can be concluded that even though students spend less time in school and take fewer classes they were being well prepared for employability. This means the skills they were learning were needed by employers.

Recommendations

Based on the data collected and the conclusions of this study, it is recommended that MPTC continue to provide the short-term training availability. Though there were no significant findings that students prefer the short-term training over the technical diploma program having a variety of offerings will encourage students to attend MPTC. Employers support of the program was evident during the collection of data. Many employers referred to the higher level of soft skills that the bootcamp students possess, which is a positive indication that the program structure is working.

Another recommendation would be for MPTC to look into the soft skill training in the technical diploma program. Employers indicated that bootcamp students tend to have better attendance, better problem solving skills, and an easier time transitioning into the workplace. It

would be beneficial for MPTC to develop ways to incorporate more soft skill training into the technical diploma program. This would boost employer support the technical diploma program and satisfaction of the students coming from the program.

Recommendations for Further Study

Based on the conclusions of this study there is a recommendation to further study employer support of the welding programs at MPTC. This study revealed that employers are satisfied with students of the welding programs however, the numbers of students they employ is relatively low considering how many students complete per year. It would be recommended that a study be done to reach out to a larger group of employers to determine a satisfaction level.

It would also be recommended for a study to be completed to determine if the current curriculum is the curriculum that employers need. Many of the student respondents indicated that they do not use some of the skills that they learned at MPTC. This study should look into the possibility of increasing the use of skills vs what is taught in school.

Finally, it is recommended that a study be completed to understand why employers indicated that bootcamp students tend to have a higher level of soft skills. By completing this study it could help develop new soft skills training into each of the welding programs.

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Appendix A: Employer Survey

Employer Survey

Start of Block: Instructions

Instructions

When completing this survey, it would be best for you to think about a typical day as a welder in your facility. We are interested in the skills they use in day to day work, not the skills that are used rarely or by a few key employees in the facility.

Q1 How many MPTC graduates from either the welding technical diploma or the welding bootcamp do you employ?

- 0-5 (1)
 - 6-9 (2)
 - 10-14 (3)
 - 15 or more (4)
-

Q2 What are the primary job duties of welders in your facility?

Q3 Please use the rating scale and answer this question to the best of your knowledge.

	Always (1)	Very Often (2)	Sometimes (3)	Rarely (4)	Never (5)
To what extent does your organization recognize and use American Welding Society (AWS) standards? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 Please use the rating scale and answer this question to the best of your knowledge.

	Not at all familiar (1)	Slightly familiar (2)	Somewhat familiar (3)	Moderately familiar (4)	Extremely familiar (5)
To what extent are you familiar with the AWS definition of an "entry level welder" is? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 What technical skills do you see as most important to the success of a welder at your organization?

Q6 What soft skills do you see as most important to the success of a welder at your organization?

Q7 What are the gaps (if any) in technical or soft skills between employees (bootcamp or technical diploma welders) in your organization?

Q8 Please use the rating scale and answer this question to the best of your knowledge.

	Completel y dissatisfie d (1)	Mostly dissatisfie d (2)	Somewha t dissatisfie d (3)	neither satisfied or dissatisfie d (4)	Somewh at satisfied (5)	Mostly satisfie d (6)	Completel y satisfied (7)
How would you rate your experienc e with students from the Welding Technica l Diploma program at MPTC? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Please use the rating scale and answer this question to the best of your knowledge.

	Completel y dissatisfie d (1)	Mostly dissatisfie d (2)	Somewha t dissatisfie d (3)	neither satisfied or dissatisfie d (4)	Somewh at satisfied (5)	Mostly satisfie d (6)	Completel y satisfied (7)
How would you rate your experienc e with students from the Welding Bootcam p at MPTC? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B: Student Survey

Student Survey

Start of Block: Informed Consent

Survey Instructions

When completing this survey think about your normal work day. You should think about the skills you learned during your time in your respective MPTC welding program and if you use them during your day to day work activities.

End of Block: Informed Consent

Start of Block: Questions

Q1 Did you complete the welding technical diploma between the years of 2015 and 2018?

Yes (1)

No (2)

Q2 Did you complete the welding bootcamp between the years of 2015 and 2018?

Yes (1)

No (2)

Q3 What was the primary reason you chose the program you did?

- Cost (1)

 - Time Spent in School (2)

 - Skills Learned (3)

 - Other (4)
-

Q4 Do you currently work in the field of manufacturing or welding?

- Yes (1)

 - No (2)
-

Q5 Before answering this question think about your typical work day.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
How often do you use all of the GMAW Skills you learned in school at work? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6 Before answering this question think about your typical work day.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
How often do you use all of the GTAW Skills you learned in school at work? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 Before answering this question think about your typical work day.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
How often do you use all of the SMAW Skills you learned in school at work? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 Before answering this question think about your typical work day.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
How often do you use all of the FCAW Skills you learned in school at work? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Before answering this question think about your typical work day.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
How often do you use all of the Blueprint Reading skills you learned in school at work? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10 Think about your typical work day and then rate the following statement.

	Strongly disagree (1)	disagree (2)	Neither agree nor disagree (3)	agree (4)	Strongly agree (5)
The soft skills I learned in school are useful at work. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 After completion of your program. Did you feel prepared for employment in manufacturing?

- Yes (1)
- Neutral (2)
- No (3)

End of Block: Questions