

QUALITY ASSURANCE TECHNICIAN

Needs Assessment

Prepared by:

**The Office of Institutional Planning and Analysis
Oakland Community College**

December, 1993

QUALITY ASSURANCE TECHNICIAN PROGRAM

EXECUTIVE SUMMARY

- This needs assessment was conducted to assist in the determination of the compatibility of the manufacturing industry's quality assurance needs and Oakland Community College's educational responses to those needs.
- While the overall enrollment in Quality Assurance has risen over the past decade at OCC, it has fallen over the past few years. There have been only four graduates since the program was implemented in 1982.
- OCC's Quality Assurance Technician program has not had an active advisory committee since 1986.
- The majority (71%) of employers surveyed require a high school education for entry level employees. However, 17% indicated that they require an associate degree. When asked to rate skills they felt were the most important, Statistical Process Control techniques received the highest rating (79%), followed by blueprint reading (69%). Currently OCC does not offer blueprint reading as a "stand alone" course in its curriculum.
- Industry experts stated that the need for manufacturing quality assurance personnel will show growth in the "supplier" industry - those companies who supply bigger manufacturers. Forty-three percent of employers surveyed stated that their need for quality assurance technicians will increase over the next 12 months. Of those, 58% indicated that they would hire new quality assurance employees. The major reasons for the increased need are expanding organizations (61%) and keeping up with new industry standards (68%).
- Data collected from the OCC employer survey indicates that salaries for employees in quality assurance vary by positions; technicians earn an average of \$20,994 per annum, inspectors earn an average of \$21,781, while managers earn an average of \$30,168.
- Most of the surveyed students (80%) who have taken quality assurance courses over the past year indicated that the program met their expectations. There was high level of satisfaction (83%) with the program's faculty. Seventy-six percent of respondents were satisfied with the content of the courses while 56% were satisfied with the variety of courses. Student dissatisfaction was noted primarily with the availability of up-to-date technology and laboratory facilities (42%), scheduling of courses (34%), and the quality of text books (29%).
- According to many quality assurance professionals, the two-year post-secondary programs that have experienced the most success are those that have established a strong commitment to providing the students with up-to-date technology in the classroom. Also, the more successful programs have also implemented cooperatives and apprenticeships to provide students with practical "hands-on" opportunities. Additionally, effective programs have tailored their instruction to match the needs of the manufacturing industry. Institutions that succeed in these areas are those who usually have established active advisory committees and employ full time faculty.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

INTRODUCTION	1
Description of Existing Program	1
External Support for Quality Assurance Technician Program	4
Description of Occupation	4
METHODOLOGY	5
Methods of Data Collection	5
Methods of Data Analysis	6
ANALYSIS	8
Outlook for the Industry	8
<i>Employment Opportunities</i>	8
<i>Retraining Opportunities</i>	11
Employee Benefits	12
<i>Wage and Salary</i>	12
<i>Advancement Opportunities</i>	14
Occupational Factors	14
<i>Opportunities for Minorities</i>	14
<i>Level of Training Required</i>	14
<i>Special Requirements for Quality Assurance Technicians</i>	18
<i>Adequacy of Currently Available Training</i>	20
<i>Adequacy of OCC, QAT Program</i>	24
CONCLUSION	30
Summary	30
Issues	30
REFERENCES	32
APPENDIX A QUALITY ASSURANCE TECHNICIAN PROGRAM DESCRIPTION ...	35
APPENDIX B EMPLOYER SURVEY	39
APPENDIX C EMPLOYERS SURVEYED	47
APPENDIX D QAT Narratives from Employer Survey	57
APPENDIX E QAT Student Survey	77
APPENDIX F Narratives from Student Survey	81
APPENDIX G AMERICAN SOCIETY FOR QUALITY CONTROL CERTIFICATION ..	89

OAKLAND COMMUNITY COLLEGE QUALITY ASSURANCE TECHNICIAN NEEDS ASSESSMENT

INTRODUCTION

The purpose of this report is to present current industry needs and educational trends related to the technology of quality assurance or quality control. It is intended to assist the Department and the College Administration in planning for the future of the Quality Assurance Technician (QAT) program. Initiated by Dr. Bill Rose, Dean of Academic Services at Oakland Community College's Auburn Hills Campus, this needs assessment is part of an on-going effort to evaluate the viability of all vocational programs at the college. This report contains a comprehensive literature review, data supplied by industry analysts, personal interviews with industry experts and professionals, an examination of post-secondary programs with similar curriculum, and telephone surveys of employers in the manufacturing industry who employ quality assurance and or quality control personnel and students who have recently enrolled in the Quality Assurance Technician program of Oakland Community College.

During an initial meeting, Dr. Rose and Donald Tremper, Apprentice Coordinator, Auburn Hills Campus, commented that they wanted the Quality Assurance Technician program at Oakland Community College to become "viable again." At the time of the meeting, program courses were being taught by four adjunct instructors. Both Rose and Tremper believed that it was incumbent that the department secure a full-time faculty member dedicated to ensuring that the program meets the needs of industry standards.

Description of Existing Program

The Quality Assurance Technician program at Oakland Community College leads to an associate degree or certificate in quality assurance and reliability. The program covers all phases of quality assurance, requiring the completion of 72 semester credit hours of course work. Within the core of study, the curriculum consists of 27 credit hours of major requirements and 35 credit hours of required supportive courses related to quality assurance (Appendix A). Requirements for a certificate in quality assurance are the completion of all core courses in the Quality Assurance Technician program.

All courses within the Quality Assurance program are taught exclusively at the Auburn Hills campus. Classes are conducted at the technology facility where work stations are provided for student instruction as well as traditional classroom settings. Currently, QAT has no active cooperatives or apprenticeship options. In addition, there are no joint program ventures with other post-secondary institutions at this time. However, it was suggested by Dean Rose and other department members that it would be a benefit to the program if such opportunities were pursued.

Dr. Rose and Don Tremper stated that nearly 85% of the students currently enrolled in the Quality Assurance Technician program are already working as inspectors and technicians. They also believe that most of the employment opportunities for quality assurance personnel are in the auto production industry or a related field.

The Quality Assurance Technician program was initiated at OCC in academic year 1981-1982. After academic year 1983, enrollment dropped the following two years by nearly 50%. However, from academic year 1986-1987 to academic year 1989-1990 enrollment increased steadily, reaching its highest annual duplicated headcount of 184 in 1990. Since that year enrollment has slowly decreased, dropping to 138 duplicated headcount in 1991-92. Thus, although the ten-year trend in enrollment shows an overall increase of 130%, in more recent years enrollment has followed a downward trend. Since the program was implemented there have been four associate degrees and no certificates awarded (Table I and Figure I).

Currently, the QAT program has no active advisory committee to assist in the development of program objectives and curriculum. The last QAT advisory committee meeting was held on May 24, 1986. Minutes of that meeting indicate that many of the advisory members were unable to attend. During the meeting members expressed concern over the program's lack of direction and recommended that a full-time faculty member should be hired to oversee the program and curriculum development. The minutes also stated that a student survey was conducted at an unspecified time. Responses included comments that the QAT program was disorganized, the textbook was very expensive and was rarely used by the instructor, the quality of instructors was inconsistent, and there was a need to offer upper level courses. Students also suggested that the program needed to be unified by a full-time instructor (Appendix B).

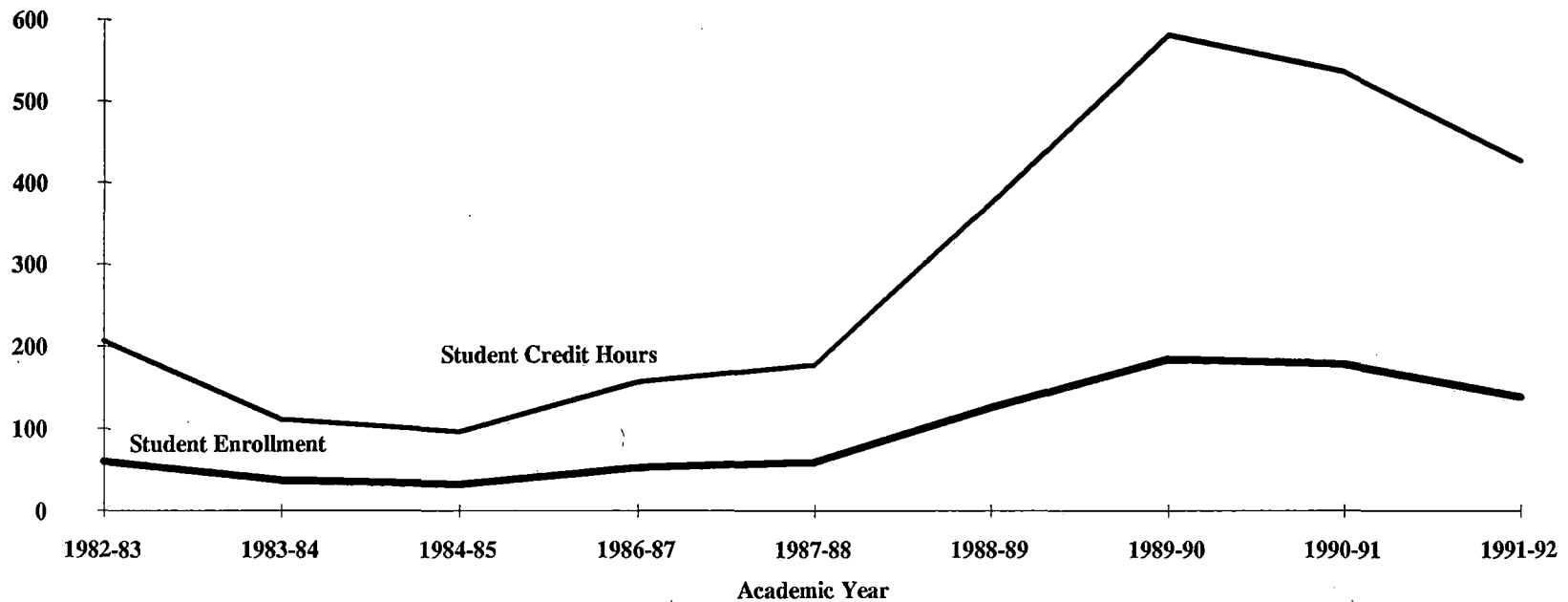
**Trends in Annual Student Headcount and Annual Student Credit Hours*
in Quality Assurance Technology**

Table 1 and Figure 1 depict a ten year trend in the total annual duplicated student enrollment and total student credit hours. Data is based on the course's official count date.

**Table 1
Academic Year**

	1982-83	1983-84	1984-85	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	Ten Year Percent Change
Student Headcount	60	37	32	52	59	125	184	178	138	130.0
Student Credit Hour	207.0	111.0	96.0	156.0	177.0	375.0	581.0	536.0	427.0	106.3

**Figure 1
Quality Assurance Technology**



*Students represent annual duplicated headcount.

External Support for Quality Assurance Technician Program

As reported in the June/July 1993 issue of OCCurrences, Oakland Community College Chancellor Patsy Fulton accepted a Ford Motor Company Fund Gift of \$10,000 from Paul R. Nolan, Wixom Assembly Plant Manager and OCC Foundation Board member. The contribution will be used to purchase a metrology workstation for students enrolled in the Quality Assurance Technology program. Additionally, micrometers and gauges purchased with these funds will be used to assist in the instruction of specific core courses in the Quality Assurance Technician program as well as courses in Computer Aided Design, Computer Integrated Manufacturing, Robotics and Machine Tool Technology.

According to Susan Weiss, Executive Director, OCC Foundation, OCC is seeking additional financial support from manufacturing related companies to help fund other workstations. Currently, students in the Quality Assurance Technology program share one set of tools with students in the Machine Tool Technology program. Instructors would like to have ten additional workstations dedicated to students enrolled in Quality Assurance Technology, Machine Tool Technology, and Manufacturing Processing. Teams of five students would share one workstation in class.

Description of Occupation

Over the past couple of decades, the diversity of skills needed by individuals in the field of quality assurance has increased as fast as the technology of the manufacturing industry itself. It is generally believed that quality assurance programs originated in the manufacturing industry where massive production facilities developed quality control policies to ensure that a particular product was meeting specific standards. By testing product at specified points along a production line companies found that time and money could be saved. Today, many of the quality assurance philosophies and concepts that emerged from these production operations have been adapted and implemented into nearly all facets of business, service industries, health care, education and government. In fact, there are many who believe that because of the new emphasis on Total Quality Management (TQM), quality techniques and procedures will be standardized in every facet of business: both in the public and private sector.

While there are companies who have very specific quality assurance policies and employ large quality assurance staffs, complete with quality managers and analysts, there are many companies that have only one full-time or one part-time technician performing quality assurance or quality control duties. Usually, the size of the company will dictate the procedure by which quality assurance is implemented. Nonetheless, it is largely agreed that specific technical skills are needed to perform these duties in a manner whereby cost-effectiveness and product quality are realized and maintained.

Although there are many different kinds of quality assurance applications, the job description that best applies to this study and the Quality Assurance program at OCC is directly related to and most used in the manufacturing industry. This description as identified by MOIS is as follows:

Quality Control Technicians test and inspect products at different stages of production in order to maintain the quality of each product. They set up and perform various tests on the product, record the data, and make computations. Once the tests are completed, they evaluate the results and make recommendations. Quality-control technicians may specialize in design, incoming material, process control, production evaluation, inventory control, product reliability, research and development, and administrative application.

The description of Quality Control Technician as offered by the Dictionary of Occupational Titles is similar. However, it includes the ability to interpret engineering drawings, schematic diagrams, or formulas to arrive at specified quality and reliability standards. In addition, the definition includes the ability to set up and perform destructive and nondestructive tests on materials, parts, or products to measure performance, life, or material characteristics. Also, the technician must record test data using statistical quality control procedures and prepare data and show deviations from existing standards.

METHODOLOGY

Methods of Data Collection

To review the field of quality assurance technology, a general literature search was performed. To obtain general occupational information, such as employment outlooks and occupational descriptions, sources such as The Dictionary of Occupational Titles and the Michigan Occupational Information System (MOIS) were used. Moreover, efforts were made to contact a variety of professional, industry, public and regulatory bodies.

In order to obtain current occupational information, a telephone survey of 65 employers was conducted in June 1993. Employers from three of the largest manufacturing industry types in Southeast Michigan were contacted and asked questions regarding hiring practices, potential employment opportunities and desired qualification for entry-level employees (Appendix C). The employers were selected randomly from Dun's Regional Business Directory and as recommended by faculty from OCC and other post-secondary institutions. The three main employer industry types are plastics and rubber manufacturers, primary and fabricated metals manufacturers and automotive/machine/tool manufacturers. These companies represented a variety of sizes and interests (Table 2 and Figure 2).

Information about educational opportunities in quality assurance was gathered through a review of existing Quality Assurance, Quality Control and Industrial Inspector Technology programs in post-secondary institutions in Michigan. Comparisons of enrollment and graduation information were made, and an examination of program content was conducted. Additionally, 42 students who had taken at least one QAT course at OCC in the previous 12 months were surveyed by phone in May, 1993. They were asked about their educational goals and satisfaction with the program (Appendix D).

Methods of Data Analysis

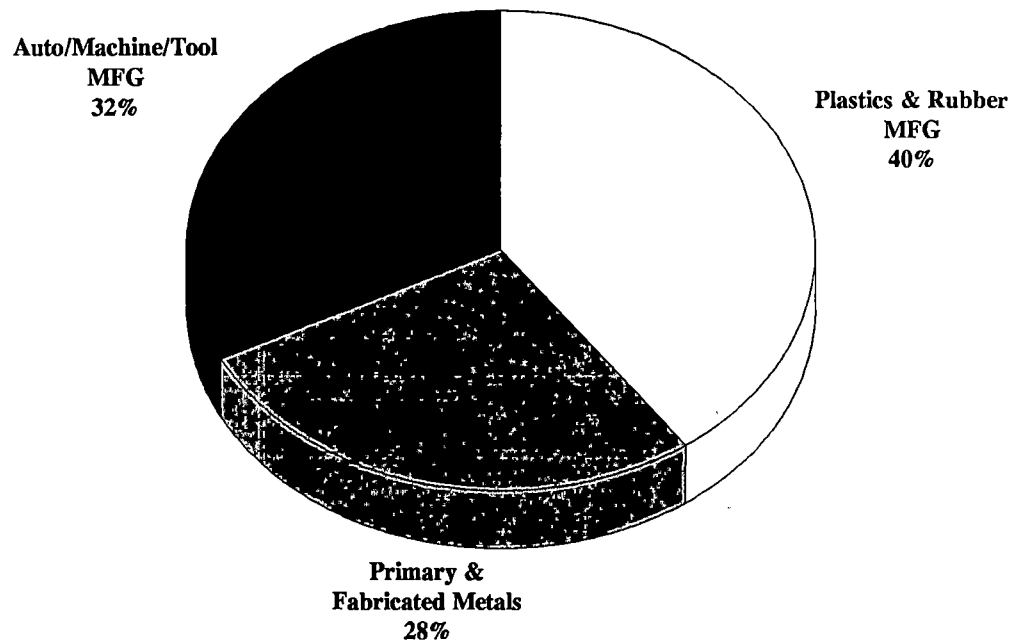
A total of 65 employers responded to the telephone survey. Data was analyzed by means of frequency distributions and correlations. Verbal responses were analyzed for content. The narrative responses of employers can be found in Appendix E, and the entire complement of student narrative responses is included in Appendix F.

Table 2

Employer Categories

Category	Number Responding	Percent of Total
Plastics & Rubber MFG	26	40.0
Primary & Fabricated Metals	18	27.7
Auto/Machine/Tool MFG	21	32.3
All Employers	65	

Figure 2
Type of Employers Surveyed



ANALYSIS

Outlook for the Industry

Industry experts believe the need for manufacturing quality assurance technicians will remain constant for the near future. However, many believe employment opportunities will improve in the automotive support industries such as those manufacturers who produce parts for the Detroit auto-makers. Ben Selleck, Professor of Metrology & Calibrations, Macomb Community College, states that the supplier industry in manufacturing will have more potential for job opportunities for graduates coming out of a 2-year program in the future. He believed that there was a big jump in the 1980's in Quality Assurance as the supplier industry became more predominant in the manufacturing industry. This opinion was echoed by Rod Monroe, Quality Training Consultant for Ford Motor Company. Monroe believes more manufacturing companies such as suppliers are looking to quality in manufacturing.

Additionally, industry experts believe that many U.S. manufacturers are preparing to make innovative changes in quality assurance because of the competitive world environment in which they operate. Currently, the International Organization for Standardization (ISO) is making a significant impact on how American companies do business. Les Schnoll, Quality Auditor Manager at Dow Corning Corporation, Midland, Michigan, says the ISO concept will make a very big impact in the United States in the coming years. He predicts that most of the major companies that have established quality programs will register and implement the ISO standards, particularly the "big 3" auto makers. Currently 62 countries, including most of Europe, subscribe to the ISO standards. Schnoll believes that any college or technical school would do a great service to the students they serve by incorporating academic studies that target the ISO concept.

Employment Opportunities

According to MOIS there are no definitive statistical data specifically addressing the number of Quality Assurance Technicians who are currently employed. For data collection purposes, MOIS grouped Quality Assurance Technicians with Industrial Engineering Technicians. Nationally, according to MOIS, about 381,200 Engineering Technicians, other than electrical and electronic, were employed in 1988. Employment of all Industrial Engineering Technicians is expected to grow about as fast as the average for all occupations through the year 2000. Technicians will be needed because of industrial expansion, greater complexity of operations, and emphasis on scientific management to reduce costs, improve quality, and increase productivity. Other factors are increased interest in energy and environmental control; expansion of research and development programs; and the need for Technicians in production, maintenance, technical sales, installation, and service jobs.

According to MOIS, in 1988, there were about 1,100 Industrial Engineering Technicians employed in Michigan, the majority (75.8%) working in urban areas. Industrial Engineering Technicians worked for manufacturing firms, wholesale and retail firms, engineering firms, government agencies, trucking and warehousing businesses, and mining companies. Of those employed in manufacturing, 47% worked for auto, truck, and other transportation equipment companies.

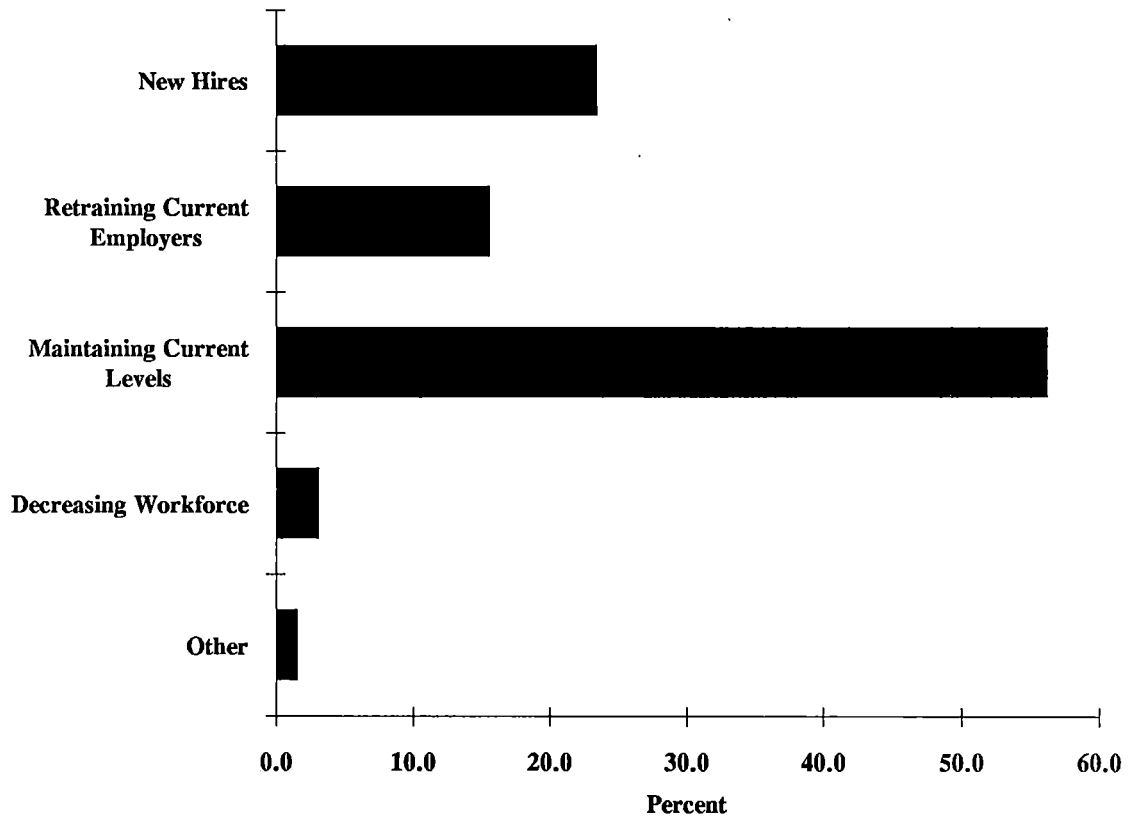
Within Michigan, the Michigan Employment Security Commission states that little or no change in the employment of Industrial Engineering Technicians is expected to take place through the year 2000. An average of 40 annual job openings is expected with most due to the replacement of those who retire or leave the labor force for other reasons. Additional openings will occur as workers change jobs or occupations. The lack of employment growth for Industrial Engineering Technicians through the 1990's is due primarily to increased competition from graduates of 4-year engineering programs seeking employment as technicians in new "high tech" firms. Also, the supply of industrial engineering technology graduates from 2-year post-secondary programs is expected to exceed the number of projected openings. Additionally, MESC research shows minimal growth in what they describe as "All other engineering technician categories." They project that by the year 2000 there will only be an 8% growth rate increase from 1988 with average annual openings being 500: 400 replacement and 100 actual growth.

According to the OCC employer survey, employment opportunities for quality assurance technicians look promising in Southeast Michigan. Of the 65 employers surveyed 43% indicated that their need for quality assurance technicians will increase over the next 12 months while more than 50% stated their need would remain the same (Table 3 and Figure 3). When analyzed by employer group, 54% of those who indicated an increased need for quality assurance personnel were in plastics and rubber manufacturing. Furthermore, 58% of those who stated that their need would increase indicated they would hire new employees to satisfy their requirements while 39% indicated they would retrain current employees. The major reasons cited by employers for the growing need for quality assurance technicians were keeping up with new industry standards (68%) and expansion of their organizations (61%).

Table 3
Current Level of Hiring

	Number Responding
New Hires	15
Retraining Current Employers	10
Maintaining Current Levels	36
Decreasing Workforce	2
Other	1

Figure 3
Current Level of Hiring



When asked if they experienced any difficulties finding entry level quality assurance personnel, 38% of surveyed employers indicated that they did. Typical reasons cited by employers who experienced difficulties included:

"Lack of training and experience."

"Lack of education in area of inspection and blue print reading."

"Presently have an ad running in the paper - disappointed with the low number of applicants responding."

"Finding the right fit - the combination of skills, knowledge to fit into the position available."

"No background in quality assurance. Do not understand the manufacturing mode."

"Trouble finding individuals with Geometric Dimensioning and Tolerancing skills - appropriate math skills."

Retraining Opportunities

Employers were asked if they provide any formal internal or external quality assurance training for existing employees. Of the 65 employers surveyed 55 (86%) responded that they provide internal training. In addition, 48 (77%) stated that they provide external training. Narrative comments on the nature of training provided include:

"Training in SPC. Operator training and other classes as needed. Company has tuition reimbursement - if class applies to company's needs, will pay."

"Have a corporate training staff (most training handled through them). Introduction to quality philosophy, S.P.C., D.O.E., and metrology."

"Big three auto makers come in to present 3-day seminars. We go to Macomb Community College for S.P.C., Geometric Dimensioning and Tolerancing and Total Quality Management."

When asked if they would consider sending current employees to OCC for retraining in the Quality Assurance Technician program, 61% were interested. In addition, 23% of the employers indicated that they would be interested in participating in customized training provided by OCC's Business and Professional Institute.

Currently, David Powell of OCC's Business and Professional Institute (BPI) stated that BPI has a very successful program providing local manufacturers with quality assurance training and instruction for their employees. BPI averages between 12 to 15 requests per year from businesses seeking customized training in quality assurance. Funding is provided by Michigan's Economic Development Job Training Program whereby state grants are awarded to qualified companies who are either training new employees or are retraining existing staff in quality assurance. BPI provides instructors and professional materials for single or extended course instruction. Powell indicated that the demand for instruction in quality assurance has been strong and that it ranks as one of BPI's most popular programs.

EMPLOYEE BENEFITS

Wage and Salary

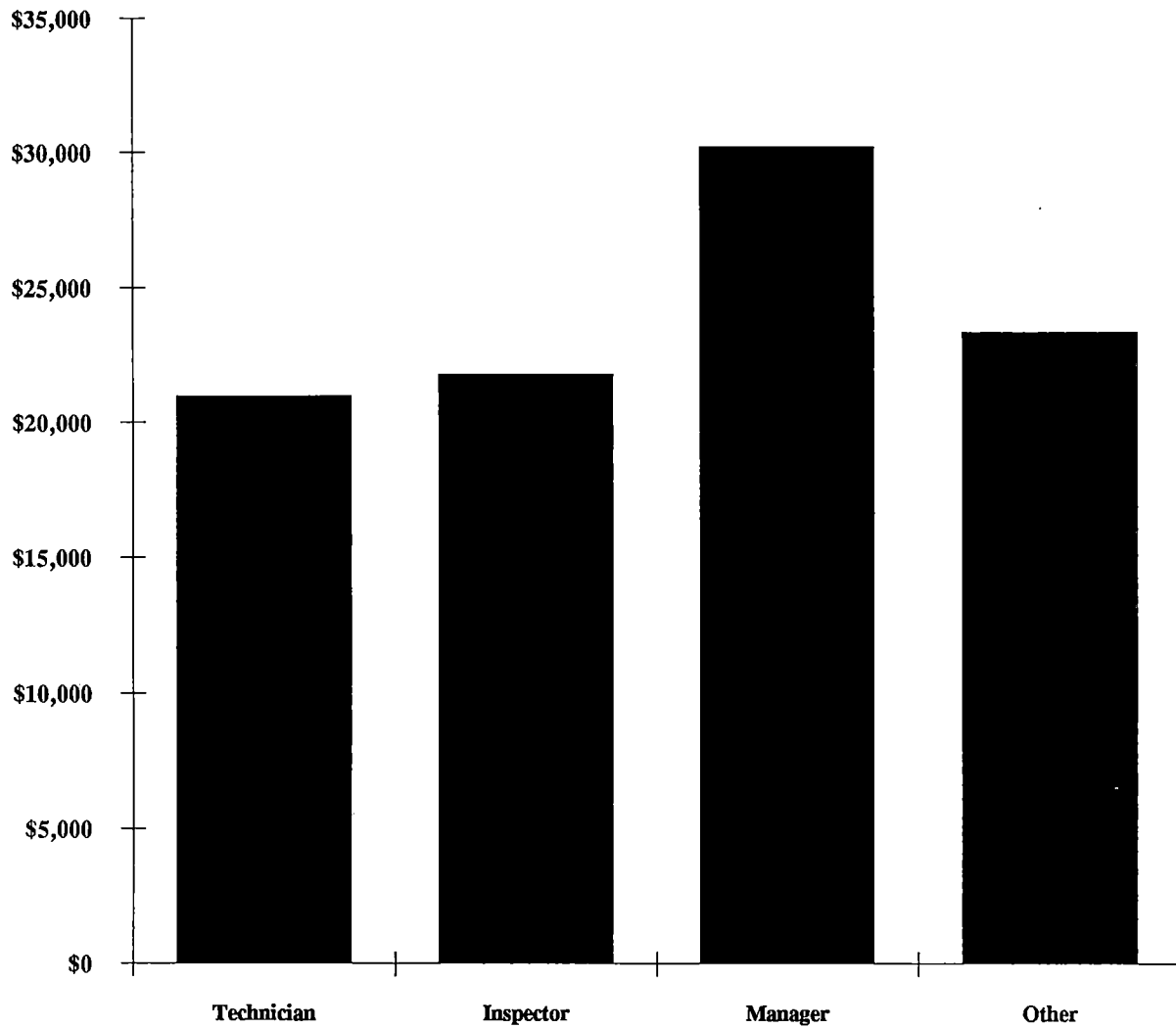
According to MOIS, earnings for job descriptions covered under the title of Industrial Engineering Technician can vary depending on the level of education, specialties, abilities and work experience of the employee as well as size, type and geographic location of the company. Nationally, in 1990, the average salaries for Industrial Engineering Technicians in private industry ranged from \$19,674 to \$37,036. In Michigan, salaries paid to Industrial Engineering Technicians are comparable to those salaries paid nationally.

Data collected from the OCC employer survey produced a range of salaries in the private industry from \$11,564 to \$40,000 with an average of \$24,062. When analyzed by job title the mean annual salary for Technicians was \$20,994 with only marginal differences across industry types. The mean annual salary for Inspectors was \$21,781 with a mean of \$23,068 in the automotive/machine/tool industry. The mean annual salary for managers was \$30,168 with a higher mean for the automotive/machine/tool sector of \$35,000 and a lower mean for the primary and fabricated metals sector of \$26,393. The category of "other job titles" includes a variety of job descriptions ranging from clerk to chemical lab coordinator. Within this group the mean annual salary was \$23,304 with very little differences across industry types (Table 4 and Figure 4).

Table 4
Average Annual Salaries by Job Title

Job Title	Average Salary
Technician	\$20,994
Inspector	\$21,781
Manager	\$30,168
Other	\$23,304

Figure 4
Average Annual Salaries



Advancement Opportunities

Positions available to people with an associate degree in Quality Assurance are of an entry-level nature. Once graduates gain experience they then are in a position to move into supervisory positions. Further advancement may be available by receiving either on-the-job training or additional formal training.

The employer survey indicated that most companies do promote from within provided the employees obtain the necessary skills and education required for the position they are seeking. Employers gave examples of typical job titles which indicate career paths:

"Quality Technician; Quality Engineer; Quality Manager."

"Leader; Coordinator; Supervisor; Manager."

"Quality Auditor; Senior Quality Technician; Manager."

Those employers surveyed from smaller companies indicated that advancement in quality assurance is limited in their organizations. Additionally, there are instances in smaller companies where individuals are required to inspect product as well as fulfill other duties.

OCCUPATIONAL FACTORS

Opportunities for Minorities

Currently, the quality assurance field in the manufacturing industry is male dominated. Enrollment in the OCC program reflects a similar pattern. Of the 101 students who took at least one quality assurance course during the period Spring 1992 through Winter 1993, 14 were female.

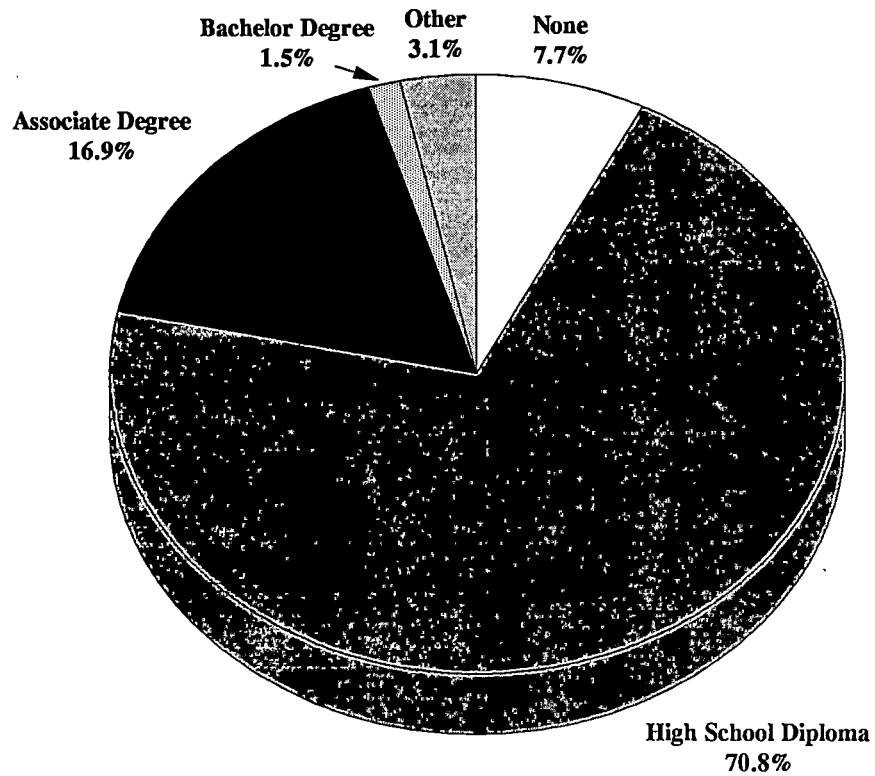
Level of Training Required

Employers responding to the OCC survey were asked to indicate the minimum levels of education, experience and other credentials required for entry level employment. Employers were questioned regarding their attitude toward what components should be part of the ideal two-year quality assurance technician program. As shown in Table 5, eleven (17%) of the 65 employers surveyed require entry level employees to have an associate degree in Quality Assurance. Although the majority of the employers (92%) have a specified educational requirement for entry level employment, most of them (71%) require only a high school diploma (Table 5 and Figure 5).

Table 5
Educational Requirements for Entry-Level Positions

Education	Number	Percent
None	5	7.7
High School Diploma	46	70.8
Associate Degree	11	16.9
Bachelor Degree	1	1.5
Other	2	3.1

Figure 5
Educational Requirements



Employers were also asked to rank the non-academic skills they deemed important in an employee. Table 6 represents a percentage breakdown of skills listed by employers as "very important." "Teamwork skills" was rated the highest at 99%, and "individual initiative" was considered "very important" by 74% of the employers. Many of the employers stated that quality assurance personnel are expected to "trouble-shoot" problems, taking the initiative to identify potential or existing problems and prescribing and/or implementing a remedy. As represented in Table 6, 71% of the employers indicated that problem solving skills are "very important." They stated that quality assurance personnel will have to make "judgment calls" during their daily routines. Half (51%) of the employers expressed the view that writing skills were "very important." Also, 60% of the employers considered "organizational skills" as being "very important" (Table 6 and Figure 6).

When asked what the single most important quality, skill or characteristic they looked for when hiring quality assurance employees, most of the employers responded with either the ability to communicate or the capability to take the initiative when presented with a problem solving situation. Other comments include:

"Ability to work in a team environment."

"Need an aggressive person, knowledgeable; self-starts; hard worker."

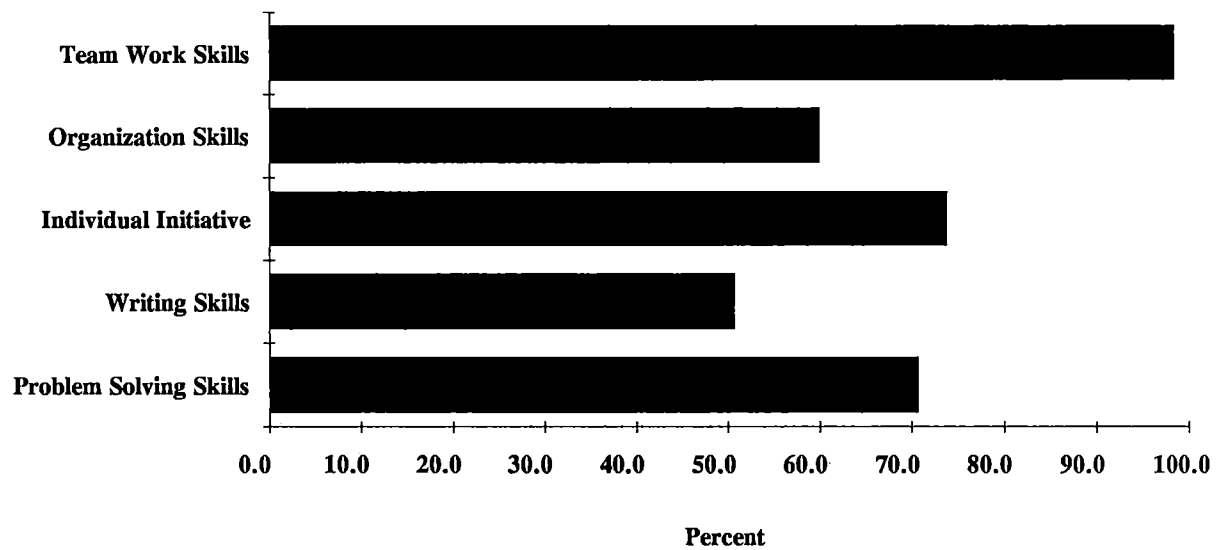
"Attendance; able to follow orders; being observant."

"Confidence in ability to make decisions."

Table 6
Personal/General Education Characteristics Viewed
as "Very Important" for Entry-Level Employees

Characteristic	Number	Percent
Team Work Skills	64	98.5
Organization Skills	39	60.0
Individual Initiative	48	73.8
Writing Skills	33	50.8
Problem Solving Skills	46	70.8

Figure 6
Characteristics Ranked as "Very Important"



Employers were also asked what academic skills are important when hiring employees (Table 7 and Figure 7). Statistical Process Control techniques received the highest rating (79%) from employers as being "very important." This is followed by blueprint reading which was rated "very important" by 69%. This is significant in that OCC does not currently have blueprint reading as a "stand alone" course in its curriculum. Computer Literacy, Principles of Total Quality Control, Dimensioning and Tolerancing, and Manufacturing Processes followed in ratings of importance.

Employers were also asked which skills their employees lack. Although 61% of the employers surveyed did not have difficulty finding quality assurance personnel, they did express some concerns about specific skills some employees needed. Their comments included:

"Lack of total quality management training."

"Lacking in written communication - writing reports."

"No computer training. Do not know how to use computer software."

"Math and blue print reading."

"Manufacturing process; speed of manufacturing."

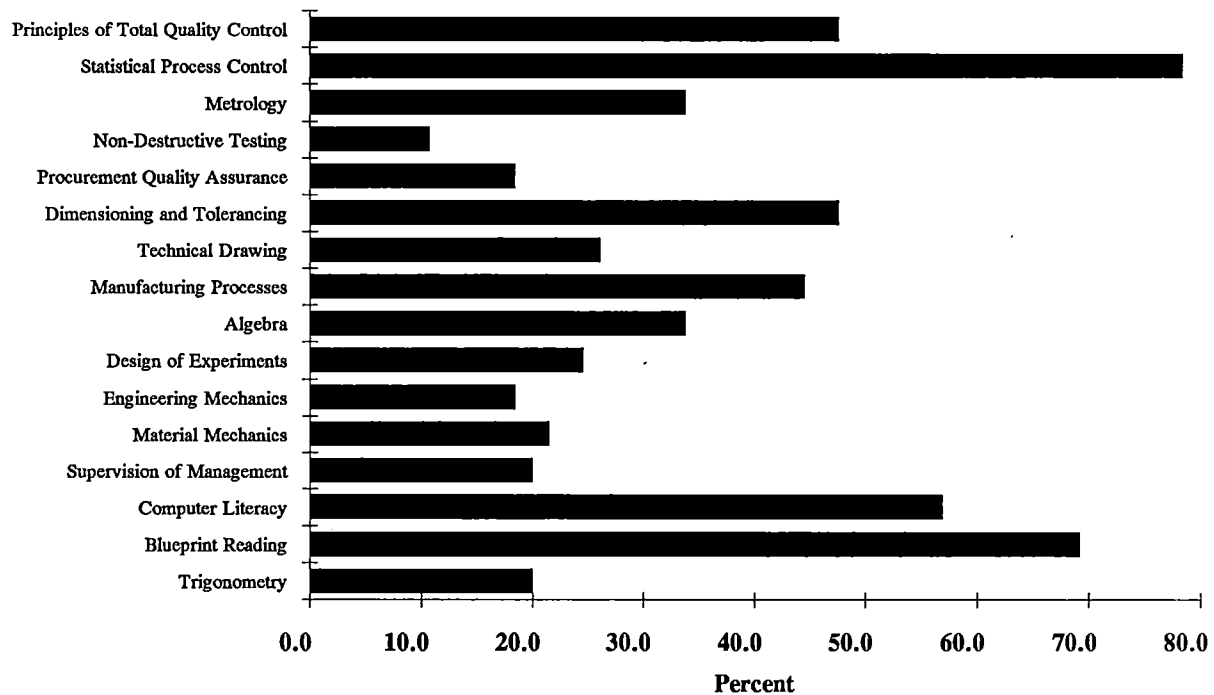
Special Requirements for Quality Assurance Technicians

While there exists no federal or state licensing requirement for individuals seeking employment in quality control or quality assurance, there are many companies and organizations that have specific requirements when accepting applications from prospective candidates for employment. The American Society of Quality Control (ASQC) provides formal recognition, through certification, to individuals in the Quality Assurance field (Appendix G). The ASQC is a grass roots membership organization and is considered to be the most recognized certification agent for individuals in the Quality Assurance field. According to the ASQC, there are more than 7,300 ASQC members in Michigan and approximately 3,200 in the Detroit metropolitan area. Of the Detroit members more than 400 are ASQC certified. The ASQC works with its members by providing seminars and specialized training to assist in furthering their careers. However, only one of the 65 respondents of the QAT employer survey requires that entry-level employees have ASQC certification.

Table 7
Technical/Academic Skills Viewed
as "Very Important" for Entry-Level Employees

Skill	Number	Percent
Principles of Total Quality Control	31	47.7
Statistical Process Control	51	78.5
Metrology	22	33.8
Non-Destructive Testing	7	10.8
Procurement Quality Assurance	12	18.5
Dimensioning and Tolerancing	31	47.7
Technical Drawing	17	26.2
Manufacturing Processes	29	44.6
Algebra	22	33.8
Design of Experiments	16	24.6
Engineering Mechanics	12	18.5
Material Mechanics	14	21.5
Supervision of Management	13	20.0
Computer Literacy	37	56.9
Blueprint Reading	45	69.2
Trigonometry	13	20.0

Figure 7
Skills Ranked as "Very Important"



Adequacy of Currently Available Training

Post-Secondary Institutions Offering Quality Assurance/Control

There are many Quality Assurance and Quality Control programs in community colleges statewide. While many of the programs are listed under different names other than Quality Assurance, most of the programs are geared toward training students to become employed as quality technicians in the manufacturing industry. According to many quality assurance professionals, the programs that have experienced the most success are those that have established a strong commitment to providing the students with up-to-date technology in the classroom. Successful programs have also implemented cooperatives and apprenticeships to provide students with practical "hands-on" opportunities. Additionally, effective programs have tailored their instruction to match the needs of the manufacturing industry.

To better evaluate OCC's Quality Assurance Technician program eleven post-secondary institutions were contacted regarding their Quality Assurance or related programs:

Henry Ford Community College:

Sally Goodwin, Director of Management Development, indicates that the Quality Management program at Henry Ford Community College is "not healthy." She says the program made a transition from quality control to quality management a couple of years ago in an attempt to provide students with needed skills for promotion in the work place. However, enrollment has not increased and has in fact, declined. Approximately 50 students have enrolled per year for the past five years with the majority of them already being employed in the manufacturing industry. There are no existing cooperatives or apprenticeships. She attributes this to the fact that there has never been a full-time faculty member to oversee the program and to implement new program options. She indicated that phasing out the program may be a consideration in the future if enrollment does not increase.

Lansing Community College:

Since its implementation in 1984, the Quality Control and Reliability program at Lansing Community College has averaged an enrollment of about 100 students per year. Over the past three years more than 40 associate degrees have been granted. Lansing currently has 3 full-time faculty members, one who is dedicated to the academic development and proficiency of the program, while the remaining two instructors work with the college's customized training program. Businesses and manufacturing companies contact the school and request specialized quality assurance training for their employees. Statistical Process Control and Total Quality Management are two of the courses taught on site. Over the last couple of years the customized training program has contributed an average of between \$150,000 and \$175,000 additional tuition revenue per year. Additionally, the school conducts an average of six to ten quality management seminars and teleconferences per year which target middle management and CEOs.

The program also provides students the opportunity to pursue certification through American Society for Quality Control. Jane Muzi, Director of Administration Operations Technology, Quality Control & Reliability, states that in the future the program will incorporate more quality management courses and will include more service oriented courses for those students who are interested or work in businesses other than the manufacturing industry.

Jackson Community College:

Greg Severance, Assistant Professor of Engineering Technologies, is the only full-time instructor dedicated to instruction in the Quality Control Program. Jackson is in the process of modifying its program and it is proposed that in the Fall semester of 1994, the program will offer an associate degree in Manufacturing with certificates being granted to those students who have specialized in quality control. Severance says that the proposed changes became necessary because enrollment in quality control has dropped in recent years. Currently, Jackson offers no cooperatives or apprenticeships in quality control. Over the past four academic years Jackson has averaged 64 students per year with a total of 6 students receiving associate degrees and 9 receiving a one-year certificate.

Macomb County Community College:

Since the program began in 1968, Macomb has seen a steady increase in student enrollment. According to Ben Selleck, Professor of Metrology and Calibration, the program averages an enrollment of between 300 to 400 students per year. An average of 33 students per year over the past three years have received associate degrees. Success in job placement and cooperatives have added to the overall effectiveness of Macomb's program. Students who desire to receive hands-on, on-the-job training can be placed with a sponsoring company and can receive credit that goes toward their degree requirements. This work-study program is a 6 1/2 month full-time work experience and has been in place at Macomb for 28 years. In addition, the Metrology and Calibration department has a job bulletin board where those students seeking employment in the industry can refer to current placements. Selleck says there are usually between 25 to 30 jobs posted on a continuous basis. Most of the students in Macomb's associate degree program are between the ages of 25-35 and have approximately 5 years of work experience. They are earning approximately \$15 per hour. Within 3 to 4 years in the industry, Selleck believes that most quality personnel should be making around \$30,000 per year. Macomb works closely with the American Society of Quality Control by conducting regularly scheduled seminars that help prepare students who are interested in taking any of the ASQC certification exams. Selleck says that Macomb considers the ASQC to be instrumental in keeping up with what is considered the "cutting edge" of industry needs. Macomb has one full-time faculty member with 10 adjunct instructors. Program development is implemented through strong contacts with alumni and the advisory committee. Selleck says, "there is no way you can have an effective program without an advisory committee that meets at least twice a year."

Northwestern Community College:

Beginning in the Fall semester of 1994 Northwestern Community College will be offering an associate degree in Quality Assurance Technology. Currently, Northwestern offers an associate degree in three areas of concentration; Drafting and Design Technology; Plastics and Mold Technology; and Industrial Engineering Technology. Each of these concentrations contains a few courses in quality assurance including SPC and Quality Control Procedures. According to Jay Beery, Director of Technical Division, Manufacturing Technology Department, an informal study was conducted which revealed that most of the students completing course work in the Industrial Engineering Technology program were being employed in quality assurance. He stated that in the light of this information the school decided that students and manufacturers would be better served if the Industrial Engineering Technology program was modified to offer an associate degree in Quality Assurance Technology. Additionally, Beery indicated that the new program will offer the opportunity to participate in on-site training where they will be placed in a manufacturing setting and gain semester credit. Also, a Manufacturing Technology Department advisory committee is being developed. Beery stated that the majority of the Industrial Engineering Technology students take only one or two courses in order to gain additional training and skills for their employment. Currently, the Industrial Engineering Technology program averages 6 to 10 declared majors per year with 1 to 2 graduates.

Schoolcraft Community College:

Schoolcraft Community College offers an associate degree in quality management. It is reported that students entering the program are normally already employed in a manufacturing setting or are seeking to secure positions as Quality Management Specialists. The program is also designed to prepare students to complete the testing requirements for ASQC certification. The program offers a 1-year certificate and a 2-year associate degree. Since its inception in 1988 the program has had an average enrollment of 33 students per academic semester.

St Clair County Community College:

The Quality Assurance Technology program at St. Clair County Community College is a relatively new program which began in the Winter semester of 1992. It is a two-year program leading to an associate degree in Quality Assurance Technology. Apprenticeships are available to quality assurance students through the school's apprenticeship division. John Borris, Department Chairperson of Applied Industrial Technology indicated that a state funded program through the Private Industry Council (PIC) helps place unemployed students with previous manufacturing technology experience or course work into internships with local manufacturing employers. Over the past three semesters student enrollment in quality assurance courses has steadily increased from 67 students enrolled in the Winter 1992 semester to 90 in the Winter 1993 semester.

Lawrence Technological University:

Lawrence Technological University offers both 2 and 4 year degrees within the Manufacturing Engineering Program. The associate degree program in industrial engineering technology offers opportunities to prepare for employment in industrial supervision, production control, inspection, and quality control. The program prepares students for positions in time and motion study, plant layout, and inspection supervision. Enrollment over the last 5 years has averaged 19 students per year. During that period of time, 11 students have graduated with an associate degree in Industrial Engineering.

Bay De Noc Community College:

Bay De Noc Community College offers a 1 year certificate in Quality Control. The program is designed to train students as Quality Control Clerks. Shirley Behrend, program director of Contracting With Business In Industry, says interested students are placed in a manufacturing related business where they work an average of 12 hours per week, usually without compensation. However, Behrend says that the program has only achieved limited success because of a decline in student and employer interest.

Grand Rapids Community College:

The Quality program at Grand Rapids began in 1988. Students can obtain an associate degree in applied arts and sciences or a one-year certificate in Quality Science. Currently, the program has one full-time faculty member and 6 adjunct instructors. According to Branville Brown, Dean of Apprenticeships and Cooperatives, the program's advisory committee meets twice a year. While no specific apprenticeship program is currently in place, they do have an ongoing program with a local brass manufacturer; employees enroll in the College's program to complete an associate degree.

Ferris State University:

Ferris State University is planning to implement a 4-year quality engineering program in the Fall semester 1994. William Winchell, a former General Motors quality assurance consultant is developing the program. Students must have an associate degree in quality assurance or quality control before entering the program. He anticipates most of the transfer students coming from Grand Rapids Community College.

While the majority of the post-secondary institutions have numerous similarities in their quality assurance curriculum, the more successful programs have distinguished themselves with active participation in advisory committees and the maintenance of full time faculty to oversee program development. Lansing and Macomb community colleges are very specific in these areas. Both schools conduct quality assurance seminars and teleconferences and work with the ASQC in providing students with up-to-date quality assurance instruction. Additionally, Lansing Community College is planning to broaden its quality assurance program by incorporating courses that are tailored to industries other than manufacturing, such as business, health services and education.

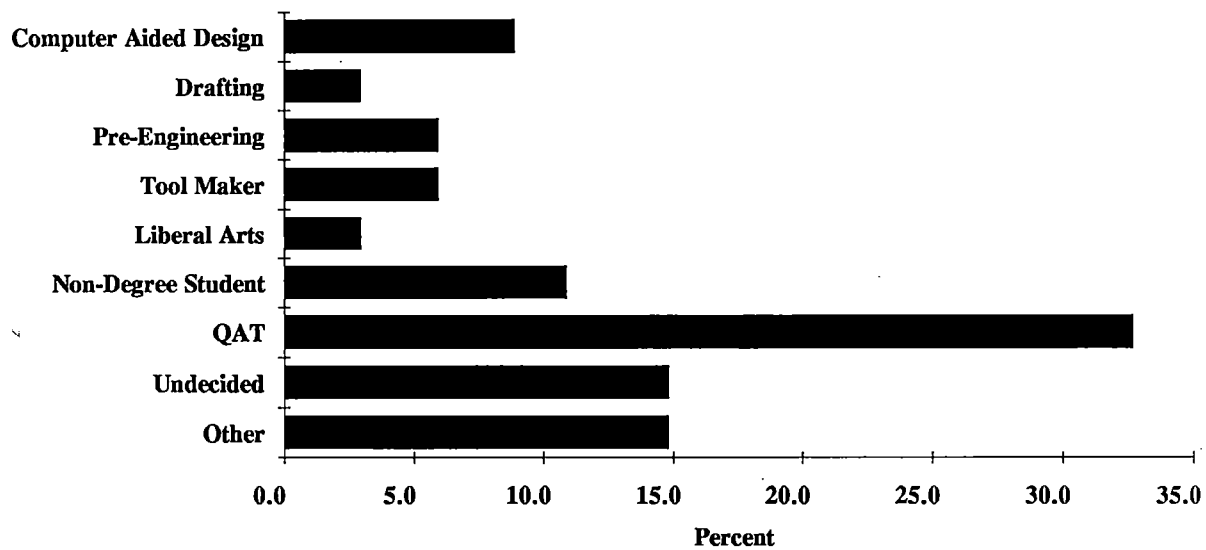
Adequacy of OCC, QAT Program

In June 1993, 41 students who had taken quality assurance courses between the Spring semester 1992 and the Winter semester 1993 were surveyed as part of this study. Students were asked to rate all aspects of the QAT program including the variety, content, and scheduling of courses, the quality of the faculty and the equipment/technology available. The survey revealed that 28 (68%) of students were majoring in quality assurance (See Table 8 and Figure 8).

Table 8
Majors of All Students Taking QAT Courses

Major	Number	Percent
Computer Aided Design	9	8.9
Drafting	3	3.0
Pre-Engineering	6	5.9
Tool Maker	6	5.9
Liberal Arts	3	3.0
Non-Degree Student	11	10.9
QAT	33	32.7
Undecided	15	14.9
Other	15	14.9
All Majors	101	

Figure 10
Students' Majors



There were 101 students (87 men and 14 women) who enrolled in at least one quality assurance course during the past academic year (1992 -1993). The students' ages range from 21 to 60. However, the mean age of the 101 QAT students in academic year 1992-93 was 35. Of the students surveyed 90% were employed full-time and 2% part-time. Of those students who are employed, 87% stated that the QAT courses they have taken at OCC were related to their current employment. Of those students who are declared QAT majors, 22 (79%) are employed in a related field.

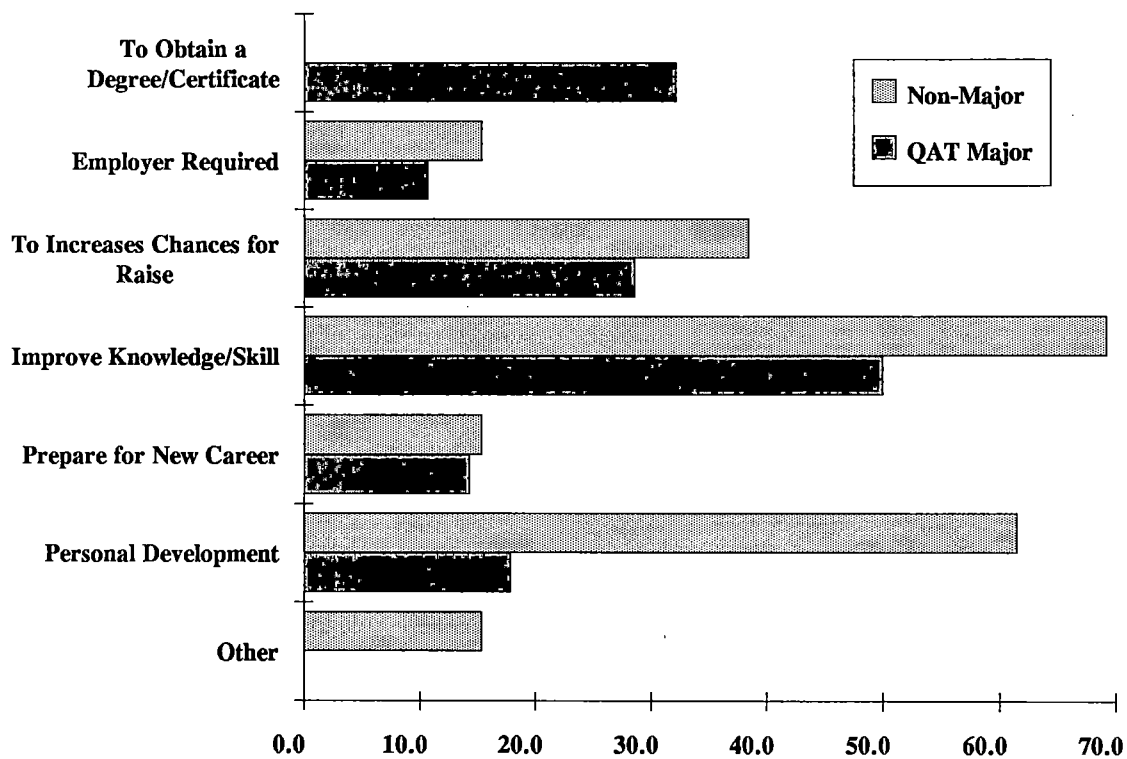
Improving knowledge and technical skills was the most common reason students gave for attending QAT courses at OCC (56% gave this answer). Thirty-two percent of the students said that they are attending classes for personal development or continuing education while 32% wanted to increase their chances for a raise and or promotion. Additionally, 15% stated that they are taking courses to prepare for a new career with 22% of students who indicated that they were seeking to obtain an associate degree or certificate.

Of the students who were QAT majors, 32% were seeking either an associate degree or certificate while 18% stated that personal development was the reason for enrolling. Exactly half of the QAT majors stated that they were seeking to improve knowledge and skills. Additionally, 29% indicated that they were taking courses to increase their chances to obtain a raise or promotion while 14% were preparing for a new career in quality assurance (See Table 9 and Figure 9). This data suggests that the majority of students who are declared QAT majors are seeking to further either their skills and knowledge or to improve their opportunities at work.

Table 9
Goals of Students Surveyed*

Goals	QAT Majors		Non-Majors	
	Number	Percent of Students Surveyed	Number	Percent of Students Surveyed
To Obtain a Degree/Certificate	9	32.1	0	0.0
Employer Required	3	10.7	2	15.4
To Increases Chances for Raise	8	28.6	5	38.5
Improve Knowledge/Skill	14	50.0	9	69.2
Prepare for New Career	4	14.3	2	15.4
Personal Development	5	17.9	8	61.5
Other	0	0.0	2	15.4

Figure 9
Goals of Students Taking QAT Courses



* Students gave multiple answers

When asked if the Quality Assurance program at OCC met their expectations, 80% of surveyed students agreed that it did. When asked about specific aspects of the program, students indicated a very high level of satisfaction with the quality of the QAT faculty - 83% of the students were either satisfied or very satisfied. A similar level of satisfaction (76%) was expressed with the content of courses taken. In addition, 56% of students were satisfied with the variety of courses offered.

However, when asked about specific aspects of the program, 42% of the respondents were either dissatisfied or very dissatisfied with the availability of up-to-date technology and lab facilities, 34% indicated that they were either dissatisfied or very dissatisfied with the scheduling of courses, 29% were either dissatisfied or very dissatisfied with the quality of textbooks. Among the surveyed students who are declared QAT majors, 43% commented that they were either dissatisfied or very dissatisfied with the scheduling of courses.

When students were asked what they disliked the most about the QAT program their responses are reflective of the above percentages. They mentioned their dissatisfaction with poor textbooks most frequently, followed by outdated equipment and technology. Relevant comments include:

"The quality seminar book did not meet the classroom criteria."

"Need to upgrade some of the equipment. The market is expanding quickly, OCC needs to keep up with the marketplace in technology."

"Need more hands-on application rather than just reading a manual. Need to show actual plant applications. Need to go into the field to find out about current applications of material."

"Class sequencing poor. Class scheduling sporadic."

"No quality control classes offered in the Spring and Summer semester. Classes offered only in Auburn Hills."

"Not enough courses offered - course material was outdated, 1987 - not current."

However, there were aspects of the QAT program that students were satisfied with. Some of the more common comments were:

"Last couple of courses involving hands-on classroom work."

"Instructor asked students to relate class work to job and to speak about it in class."

"Liked having teacher who worked in the field of quality control. Teacher open, willing to answer questions."

Students were asked to offer specific recommendations that would help improve the quality of the QAT program. Some of their comments included:

"Develop a blueprint reading course."

"Incorporate more machines into the instruction. Have more hands-on teaching."

"Send fliers to companies telling of the program....quality supervisor was not aware that OCC had a Quality Control course/program."

"Offer an additional GD&T course."

"Add more in-depth classes. Offer better scheduling."

"Get an up-to-date textbook."

Table 10
Satisfaction with the QAT Program

PROGRAM ASPECTS	Satisfied	Neutral	Dissatisfied
Variety of Courses	56.1%	24.4%	19.6%
Content of Courses	75.6%	9.8%	14.6%
Scheduling of Courses	53.7%	12.2%	34.2%
Quality of Faculty	82.9%	12.2%	4.9%
Equipment/Technology	24.4%	34.1%	41.5%
Quality of Text Books	43.9%	26.8%	29.3%

Source: OCC Student Survey, 1993

CONCLUSION

Summary

The Quality Assurance program has experienced a slight downward trend in enrollment from 1989 to present. While overall student satisfaction appears to be high, there are specific program areas that they find to be unsatisfactory. Concern was expressed over the lack of up-to-date technology, lab facilities, course scheduling and current curriculum text books. This dissatisfaction could be explained in part due to the fact that most of the students enrolled in the program are already employed and the majority of them are employed in a related field. The more successful quality assurance programs at other institutions continuously address these issues through the efforts of full time faculty members and active advisory committees.

Employment opportunities in the manufacturing industry appear promising in the near future as 43% of the employers surveyed for this study indicated that they presently have an increasing need for quality assurance personnel. Fifty-eight percent of those who stated that their need would increase indicated they would hire new employees, while 39% said they would retrain existing employees. This data along with OCC's successful BPI program suggests that there is a potential market for additional training programs in quality assurance.

It has been strongly advised by existing OCC adjunct instructors and other close to the program that at least one full time faculty member be given the responsibility to develop and implement program objectives. Furthermore, it has been suggested that a very active and participatory advisory committee is essential to the success of any quality assurance program. Industry experts say that because of the importance of the quality issue and the continuously changing nature of the technology it is essential that post-secondary institutions remain current. Encouragingly, almost two-thirds (63%) of the employers surveyed indicated that they would be willing to participate in the on-going development of OCC's quality assurance program.

Issues:

- At some time in the future it may become necessary to address the increasing diversity in quality assurance as this movement spreads to other industries outside manufacturing. Presently, the demand in Southeastern Michigan is predominately found in the manufacturing industry. Experts suggest the increasing emphasis on quality by the auto and supplier industry is driving the demand for quality assurance personnel.
- Employer surveys disclose a need for retraining in quality assurance. Sixty-one percent of the employers stated that they would be interested in sending employees to OCC to update skills in quality assurance. However, an active marketing program could assist in identifying those interested companies and could help increase student enrollment from other organizations or communities.

- There is not an active advisory committee for the Quality Assurance Technician program. A significant number of employers surveyed for this study indicated that they would be willing to participate in OCC's efforts to develop the QAT program; perhaps they could be invited to participate.

REFERENCES

American Society for Quality Control.

Beery, Jay. Director of Technical Division, Manufacturing Technology Department, Northwestern Community College. Phone conversation.

Behrend, Shirley. Director, Contracting with Business in Industry, Bay De Noc Community College. Phone conversation.

Borris, John. Department Chairperson of Applied Industrial Technology, St. Clair County Community College. Phone conversation.

Bowan, Jerry. Chairman, American Society for Quality Control, Greater Detroit Section. Phone conversation.

Brown, Branville. Dean of Apprenticeships and Cooperatives, Grand Rapids Community College. Phone conversation.

Dictionary of Occupational Titles. (1991).

Duns Regional Business Directory. (1992).

Goodwin, Sally. Director of Management Development, Henry Ford Community College. Phone conversation.

Holler, Michael. (1989, March). Quality Control Technician Curriculum, An Elusive Butterfly. Critical paper. American Technical Education Association, 26th National Conference on Technical Education.

ISO9000. Handbook of Quality Standards and Compliance. (1992).

Kapur, Rajinder. Quality Assurance Manager, Masco FarmTech Corporation, Michigan. Phone conversation.

Lynch, Edward. Dean of Technology, Macomb Community College. Phone conversation.

Michigan Occupational Information System.

Monroe, Rod. Quality Consultant/Training Consultant, Ford Motor Company. Phone conversation.

Muzi, Jane. Director of Administration Operations Technology, Quality Control & Reliability, Lansing Community College. Phone conversation.

Occupational Outlook Handbook. (1992-93).

Selleck, Ben. Professor of Metrology and Calibration, Macomb Community College. Phone conversation.

Severance, Greg. Assistant Professor of Engineering Technology, Jackson Community College. Phone conversation.

Schnoll, Les. (1993, April). One World, One Standard. Quality Progress.

Schnoll, Les. Quality Auditor Manager, Dow Corning Corporation, Midland, Michigan. Phone conversation.

U.S. Bureau of Labor and Statistics.

Weiss, Susan. Executive Director, OCC Foundation, Oakland Community College. Phone conversation.

Winchell, William. Director, Quality Control program, Ferris State University. Phone conversation.

APPENDIX A
QUALITY ASSURANCE TECHNICIAN
PROGRAM DESCRIPTION

Quality Assurance Technology

Auburn Hills

Associate in Applied Science

Quality Assurance Technology is an Associate Degree program in quality assurance and reliability with specialized concentrations. The program prepares students for entry-level employment as engineering technicians and managers in controlling quality and reliability of goods and services. Typical job areas include new design review, incoming material evaluation process control, supervision and management techniques, and product testing and evaluation. The program is designated as an Extended Associate Program because students must complete in excess of 72 credit hours.

Major Requirements

	Credits
QAT 100*	Total Quality Control.....3
QAT 101*	Principles of Quality Assurance3
QAT 102*	Statistical Process Control3
QAT 106*	Metrology4
QAT 200*	Industrial Quality Seminar2
QAT 230*	Quality Cost Control3
QAT 260*	Non-Destructive Testing3
QAT 262*	Procurement Quality Assurance3
QAT 265*	Configuration Management3

Required Supportive Courses

CIS 112	Principles of Structured Programming4
DDT 100	Fundamentals for the Drafting Industry3
ELT 101	Applied Electricity3
ENG 135★ ¹	Business Communications.....3
ENG 211★ ¹	Technical Writing3
MAT 154★	College Algebra.....4
MAT 156★	Trigonometry3
MEC 101*	Introduction to Manufacturing Processes3
MEC 102*	Manufacturing and Fabrication Practices3
MEC 201*	Engineering Mechanics3
MEC 202*	Mechanics of Materials3

General Education Requirements

See graduation requirements for an Associate in Applied Science Degree on Pages 35, 37 and 38.

Necessary Electives to Total 62 Credits

¹Prospective transfer students should substitute ENG 151, 152.

★General Education courses listed as Required Supportive may be used to meet requirements of the General Education component.

*When all the courses marked with an asterisk are completed, the student may apply for a Certificate.

APPENDIX B
EMPLOYER SURVEY

Survey Number _____

**QUALITY ASSURANCE TECHNICIAN
NEEDS ASSESSMENT
EMPLOYER TELEPHONE SURVEY**

Name of Business: _____

Type of Business: _____

City and Zip Code: _____

Telephone: _____

A. Once you reach the Director of Training, Personnel, Human Resources or other appropriate supervisor, be sure to record:

Name: _____

Title: _____

Phone: _____

Time Interview Begins: _____

B. Begin survey here:

SURVEY

We are in the process of reviewing our Quality Assurance Technician program. I'd like to talk to someone who works with quality control inspectors or technicians who would be able to comment on our curriculum and tell us what skills are needed for those students entering the quality assurance or quality control field.

SURVEYOR'S BACKGROUND INFORMATION:

The Quality Assurance Technician program at OCC is designed to prepare students for entry level employment as engineering technicians and managers in controlling quality and reliability of goods and services. Typical job areas include new design review, incoming material evaluation process control, supervision and management techniques and product testing and evaluation.

1. Do you employ quality assurance technicians?

1 _____ Yes

0 _____ No (If "No", make comment:

Since you do not employ quality assurance technicians and because the focus of our research is to obtain information from those employers who currently have quality assurance personnel on staff, we'll have to discontinue the survey at this time. I thank you for your time.

2. What are the main duties of your employees who work as Quality Assurance technicians?

3. Among your quality assurance employees, what are examples of job titles and salary ranges for entry level positions?

Entry Level Job Titles	Entry Level Salary Range
a) _____	_____ to _____ per hour
b) _____	_____ to _____ per hour
c) _____	_____ to _____ per hour

4. In your opinion, over the next 12 months will your need for employees trained as a quality assurance technician:

2 _____ increase

0 _____ decrease (If "decrease", skip and go to #7)

1 _____ Remain the same (If "remain the same", go to #7)

5. Do you plan to meet that need by:

	Yes	No
a) Hiring new employees?	1	0
b) Retraining current employees?	1	0
c) Other, Please specify: _____		

1. Do you employ quality assurance technicians?

1 _____ Yes

0 _____ No (If "No", make comment:

Since you do not employ quality assurance technicians and because the focus of our research is to obtain information from those employers who currently have quality assurance personnel on staff, we'll have to discontinue the survey at this time. I thank you for your time.

2. What are the main duties of your employees who work as Quality Assurance technicians?

3. Among your quality assurance employees, what are examples of job titles and salary ranges for entry level positions?

Entry Level Job Titles	Entry Level Salary Range
a) _____	_____ to _____ per hour
b) _____	_____ to _____ per hour
c) _____	_____ to _____ per hour

4. In your opinion, over the next 12 months will your need for employees trained as a quality assurance technician:

2 _____ increase

0 _____ decrease (If "decrease", skip and go to #7)

1 _____ Remain the same (If "remain the same", go to #7)

5. Do you plan to meet that need by:

	Yes	No
a) Hiring new employees?	1	0
b) Retraining current employees?	1	0
c) Other, Please specify: _____		

6. What are the reasons for the growing need for Quality Assurance Technicians *(Please circle all that apply)*

	<i>Yes</i>	<i>No</i>
a) Employees are lacking these skills	1	0
b) Employees with these skills are leaving the company	1	0
c) Organization is expanding	1	0
d) Keeping up with new industry standards such as the International Organization for Standardization (ISO9000)	1	0

f) Other reasons. Please specify: _____

7. What is the minimum educational qualification required by your company for entry-level personnel in quality assurance?

	<i>Yes</i>	<i>No</i>
a) No specific educational requirement	0	1
b) High School diploma or equivalent	1	0
c) Completion of Apprenticeship	1	0
d) Associate degree	1	0
e) Bachelor degree	1	0
f) Vocational certification	1	0
g) Other education or degree, not listed <i>(Please specify)</i> _____		

8a. Do you require American Society of Quality Control (ASQC) certification for entry level positions?

1 _____ Yes *(If "Yes", go #8b)*
 0 _____ No *(If "No", go to #9)*

8b. Which of the following certifications do you require?

	<i>Yes</i>	<i>No</i>
a. Certified Mechanical Inspector	1	0
b. Certified Quality Technician	1	0
c. Certified Quality Engineer	1	0
d. Certified Reliability Engineer	1	0
e. Certified Quality Auditor	1	0
r. Other <i>(specify)</i> _____)		

9. Please consider the following list of skills and qualifications you as an employer would value when hiring Quality Control/Assurance personnel. Rate each on the scale Very Important, Somewhat Important, and Not Important.

	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Not Important</i>
a) Ability to work as a team member	3	2	1
b) Organizational skills	3	2	1
c) Ability to use individual initiative	3	2	1
d) Written communication skills	3	2	1
e) Problem solving skills	3	2	1

10. What is the single most important quality, skill or characteristic you look for when hiring quality control/assurance personnel?

11. As part of our assessment, we are interested in understanding potential career paths for entry level personnel. Could you explain what advancement opportunities are available, with examples of typical job titles?

12. Do you experience any difficulties finding entry level Quality Assurance personnel?

1 _____ Yes

0 _____ No (*Skip to #14*)

13. What problems do you encounter? _____

14. What, if any, specific skills do your entry level employees lack?

9. Please consider the following list of skills and qualifications you as an employer would value when hiring Quality Control/Assurance personnel. Rate each on the scale Very Important, Somewhat Important, and Not Important.

	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Not Important</i>
a) Ability to work as a team member	3	2	1
b) Organizational skills	3	2	1
c) Ability to use individual initiative	3	2	1
d) Written communication skills	3	2	1
e) Problem solving skills	3	2	1

10. What is the single most important quality, skill or characteristic you look for when hiring quality control/assurance personnel?

11. As part of our assessment, we are interested in understanding potential career paths for entry level personnel. Could you explain what advancement opportunities are available, with examples of typical job titles?

12. Do you experience any difficulties finding entry level Quality Assurance personnel?

1 _____ Yes

0 _____ No (*Skip to #14*)

13. What problems do you encounter? _____

14. What, if any, specific skills do your entry level employees lack?

15. The following list of concepts and skills is quite long; however, we believe that it is important to consult with you on all the skills we now teach or are contemplating teaching. Please rate how important it is for entry level personnel to have a strong knowledge base in the following applications using the scale: Very Important, Somewhat Important, Not Important.

	Very Important	Somewhat Important	Not Important	Unaware of
a. Principles of Total Quality Control 3	2	1	8	
b. Statistical Process Control 3	2	1	8	
c. Metrology 3	2	1	8	
d. Non-Destructive Testing 3	2	1	8	
e. Procurement Quality Assurance 3	2	1	8	
f. Geometric Dimensioning & Tolerancing 3	2	1	8	
g. Technical Drawing 3	2	1	8	
h. Technical Writing 3	2	1	8	
i. Applied Electricity 3	2	1	8	
j. Manufacturing Processes & Practices . . 3	2	1	8	
K. College Algebra 3	2	1	8	
l. Design of Experiments 3	2	1	8	
m. Engineering Mechanics 3	2	1	8	
n. Mechanics of Materials 3	2	1	8	
o. Supervision & Management 3	2	1	8	
p. Computer Literacy 3	2	1	8	
q. Blueprint Reading 3	2	1	8	
r. Trigonometry 3	2	1	8	
s. Other _____				

16. Would your company consider sending current employees to OCC for retraining in the Quality Assurance Technician program or courses?

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

17. Does your company provide any formal in-house or external quality control/assurance training for employees?

a) In-house training: b) External training:

1 _____ Yes

1 _____ Yes

0 _____ No

0 _____ No

(If response to BOTH a and b are "NO", skip to #20)

18. Can you describe the nature of the training? _____

19. Oakland Community College works with individual companies to provide customized training that meets the specific needs of the company. Is there any specialized training that OCC could provide for your company?

0 _____ No

7 _____ Uncertain, (ask if they would like detailed information sent to them) _____ Yes

1 _____ Yes, (please explain) _____

20. Would your company consider offering internships (either paid or non-paid) for students in a Quality Assurance/Quality Control Technician program?

PAID?

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

UNPAID?

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

21. Would you be willing to help in the on-going development of our Quality Assurance Technician Program?
(This could include activities such as focus groups, advisory committee)

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

Thank you for your time and assistance. We appreciate your help and believe that your responses will help to influence what happens in our Quality Assurance Technician program in the future. If you have any further questions please contact OCC's Office of Planning and Analysis at (313) 471-7746.

Interviewer: _____

Date: _____

Time interview finished: _____

18. Can you describe the nature of the training? _____

19. Oakland Community College works with individual companies to provide customized training that meets the specific needs of the company. Is there any specialized training that OCC could provide for your company?

0 _____ No

7 _____ Uncertain, (ask if they would like detailed information sent to them) _____ Yes

1 _____ Yes, (please explain) _____

20. Would your company consider offering internships (either paid or non-paid) for students in a Quality Assurance/Quality Control Technician program?

PAID?

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

UNPAID?

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

21. Would you be willing to help in the on-going development of our Quality Assurance Technician Program? (This could include activities such as focus groups, advisory committee)

1 _____ Yes

0 _____ No

7 _____ Uncertain, please explain: _____

Thank you for your time and assistance. We appreciate your help and believe that your responses will help to influence what happens in our Quality Assurance Technician program in the future. If you have any further questions please contact OCC's Office of Planning and Analysis at (313) 471-7746.

Interviewer: _____

Date: _____

Time interview finished: _____

APPENDIX C
EMPLOYERS SURVEYED

EMPLOYERS SURVEYED

D = Willing to help in the development of a program

P = Willing to offer a paid internship

U = Willing to offer an unpaid internship

**BPI = Interested in the possibility of BPI training*

Shirley Ward (P)
Quality Assurance Supervisor
Bundy Corp
12345 E 9 Mile Rd
Warren, MI 48089
(313) 748-6500
ID# 102

Tony Simon
Midwest Fiberglass FBRCTRS Inc
2658 Porter St
Detroit, MI 48216
(313) 237-0316
ID# 115

Timothy Boyd
Quality Manager
Twin Corp
418 Hadley St
Holly, MI 48442
(313) 634-1640
ID# 103

Gary Johnson (D,P)
Vice President Quality
Freudenberg-nok
47690 E Anchor Ct
Plymouth, MI 48170
(313) 451-0020
ID# 108

Michael Beell (D)
Quality Engineer
Unique Fabricating Inc
1601 W Hamlin Rd
Rochester Hills, MI 48309
(313) 853-2333
ID# 104

Scott Hayes (D)
Quality Assurance Manager
L & L PDTS Inc
74100 Van Dyke Rd
Romeo, MI 48065
(313) 752-3591
ID# 105

Denise Killop
Quality Manager
Evans Indus. Inc
200 Renaissance Ctr/2655
Detroit, MI 48243
(313) 259-2266
ID# 120

*BPI
Daniel Helmcamp
Quality Assurance
Sheller-Globe Corp
1641 Porter St
Detroit, MI 48216
(313) 962-7311
ID# 101

Michelle Mithton (D)
Leader of Quality Assurance
Exotic Rubber & Plastics Corp
34700 Grand River Ave
Farmington Hills, MI 48355
(313) 477-2122
ID# 110

Richard Marsh
Chairman
Marsh Indus Inc
49680 Leona Dr
Mount Clemens, MI 48045
(313) 949-9300
ID# 112

Don Boyne (P, U)
Quality Assurance Manager
Stemaco PDTS Inc
5139 Lapeer Rd
Port Huron, MI 48061
(313) 987-5151
ID# 113

Joanna Allen
Controller
D&B Plastic PDTS STRLNG HTS
40715 Brentwood Dr
Sterling Hts, MI 48310
(313) 268-1880
ID# 114

Karen Bruce (P, D)
Quality Administrator
Masco Corp
21001 Van Born Rd
Taylor, MI 48180
(313) 274-7400
ID# 122

Peter Tryand
Quality Supervisor
Thetford Corp
7101 Jackson Rd
Ann Arbor, MI 48103
(313) 769-6000
ID# 125

*BPI
Robert Devine (P, U, D)
Director of Quality
Wolf ENG Corp
5433 Miller Rd
Dearborn, MI 48126
(313) 584-6200
ID# 123

Jerry Mannarino (D)
Quality Assurance Manager
Rouge Steel Co
3001 Miller Rd
Dearborn, MI 48120
(313) 594-4156
ID# 217

Kirk Havelock
Mercur Inc
11111 French Rd
Detroit, MI 48234
(313) 571-8900
ID# 216

James Predhomme (P, D)
Quality Supervisor
Prime Tube Inc
13101 Eckles Rd
Plymouth, MI 48170
(313) 451-2211
ID# 211

Charles Buehner
Quality Control Manager
Plymouth Shafting Corp
22700 Nagel St
Warren, MI 48089
(313) 755-5800
ID# 204

Jerry Dwyer
Quality Assurance
CMI INTL Inc
30333 Southfield Rd
Southfield, MI 48076
(313) 642-9450
ID# 208

*BPI
Mark Gorman (D)
PIVOT MFG CO
12685 Stout St
Detroit, MI 48223
(313) 531-7500
ID# 301

Betty Eggleton
Quality Control Manager
Madison Plastics Inc
11865 Mayfield
Livonia, MI 48150
(313) 421-3885
ID# 207

Pam Klein
Quality Control Manager
Wire-Form Inc
23720 Dequindre Rd
Warren, MI 48091
(313) 754-5700
ID# 205

Shaun Hill (D)
Quality Assurance Manager
Prestolite Wire Corp
32871 Middlebelt Rd
Farmington Hills, MI 48334
(313) 626-1336
ID# 206

*BPI
Daniel Jackson (D)
Quality Control Manager
RING SCREW WORKS
31550 Stephenson Hwy
Madison, MI 48071
(313) 583-6620
ID# 313

Norman Morrell (P, D)
Corporate, Quality & Product
Reliability
Budd Co
3155 W Big Beaver Rd
Troy, MI 48084
(313) 643-3500
ID# 209

Scott Burnham (D)
Quality Assurance Representative
DUPONT G B CO INC
500 W Long Lake Rd
Troy, MI 48098
(313) 879-0200
ID# 316

*BPI
William Mason (P, D)
Quality Assurance Manager
BORDEN L E MFG CO
15281 E 12 Mile Rd
Roseville, MI 48066
(313) 772-8180
ID# 308

*BPI
Alan Johnson
Quality Control Manager
HI-VO PDTS INC
2800 Tyler Rd
Ypsilanti, MI 48198
(313) 525-8181
ID# 315

Ron Duegsch (P, U. D)
Quality Assurance Manager
RIVERSIDE SPLINE & GEAR INC
13605 Gossett,
Rockwood, MI 48173
(313) 379-3160
ID# 319

David Pilon (D)
Quality Director
MILFORD FABRICATING CO
19200 Glendale St
Detroit, MI 48223
(313) 272-8400
ID# 303

*BPI
William Payne
Sales Manager
McLAREN ENGINES INC
32233 8 Mile Rd
Livonia, MI 48152
(313) 477-6240
ID# 302

Donald Geis (D)
Director of Quality Assurance
Federal Mogul Corp
26555 Northwestern Hwy
Southfield, MI 48034
(313) 354-7700
ID# 111

Marion Wilk (D)
Quality Assurance Manager
Indian Head Indus. Inc.
26899 Northwestern Hwy
Southfield, MI 48034
(313) 353-8960
ID# 119

Kevin Harris (P, D)
Quality Control Manager
Dynamic Seals Inc
1966 Heide
Troy, MI 48084
(313) 362-0170
ID# 106
*BPI

*BPI
Thad Smith (P, D)
Quality Control Manager
Basic Rubber & Plastic Co
3295 Haggerty Hwy
Walled Lake, MI 48390
(313) 624-4417
ID# 107

*BPI
Ron Slobodian (D)
Director of Quality Assurance
Takata Inc
2444 Koppy Dr
Auburn Hills, MI 48326
(313) 373-8040
ID# 109

Michael Koss (P, D)
Quality Control Manager
Cadillac PDTs Inc
7000 E 15 Mile Rd
Sterling Hts. MI 48312
(313) 264-2525
ID# 116

Paul England (D)
Manager Advanced Quality Planning
ITT Automotive
3000 University Dr
Auburn Hills, MI 48326
(313) 340-3000
ID# 118

Beverly Jones (P)
Quality Manager
Creative Foam Corp
300 N Alloy Dr
Fenton, MI 48430
(313) 629-4149
ID# 117

Kenneth Dusky (D)
Quality Control Manager
NYLOK FASTENER CORP
800 W University Dr/E
Rochester, MI 48307
(313) 652-6020
ID# 314

*BPI
William Loughner (D)
Plant Manager
Classic Container Corp
350 S Mill St
Plymouth, MI 48170
(313) 459-7180
ID# 126

*BPI
Susan West (P, D, U)
Quality Assurance Manager
Blachford H L Inc
1855 Stephenson Hwy
Troy, MI 48083
(313) 689-7800
ID# 124

Jeff Stevens (D)
Quality Assurance Manager
FOAMSEAL Inc
2425 N Lapeer Rd
Oxford, MI 48371
(313) 628-2587
ID# 121

*BPI
Eric Anderson
McLouth Steel PDTS Corp
1650 W Jefferson
Trenton, MI 48183
(313) 285-1200
ID# 202

John Nelson (D)
Quality Control Manager
Hoskins MFG
535 Griswold St
Detroit, MI 48226
(313) 963-3100
ID# 214

*BPI
Robert Coker (D)
Quality Control Administrator
Bing Steel Inc
1130 W Grand Blvd
Detroit, MI 48208
(313) 895-3400
ID# 203

Glen Hineman (D)
Quality Assurance Manager
Hercules Drawn Steel Corp
38901 Amrhein Rd
Livonia, MI 48150
(313) 464-4454
ID# 210

Alyse Leslie
Quality Manager
Vico PDTS Co
41555 E Ann Arbor Rd
Plymouth, MI 48170
(313)-425-6020
ID# 215

Frank Coleman
Quality Control Manager
HURON VALLEY STEEL CORP
41000 Huron River Dr
Belleville, MI 48111
(313) 697-3400
ID# 218

David Hinman
Vice President
Superior PDTS Co
21819 W 9 Mile Rd
Southfield, MI 48075
(313) 287-2070
ID# 213

Gene Roma
Plant Manager
REID MFG CO
22223 Telegraph Rd
Southfield, MI 48034
(313) 353-2450
ID# 201

*BPI
Christopher Schultz (D)
Quality Assurance Manager
FEDERAL SCREW WORKS
34846 Goddard
Romulus, MI 48174
(313) 963-2323
ID# 311

Jerry Iwanski (P)
Quality Control Manager
COLD HEADING CO
4600 Bellevue St
Detroit, MI 48207
(313) 923-7800
ID# 312

Reggie Ritz
Quality Control
GENERAL BEARING CORP
30156 W 8 Mile Rd
Farmington, MI 48336
(313) 478-1745
ID# 310

*BPI
Bonaventure Wokam (U, D0)
Quality Control Director
GENERAL SAFETY CORP
23001 W Industrial Dr
St Clair Shs, MI 48080
(313) 777-6530
ID# 305

*BPI
Bill Oldenburg (D)
Corporate Director, Quality Assurance
DURA MECH COMPONENTS
1708 Northwood Dr
Troy, MI 48084
(313) 362-8300
ID# 306

*BPI
Matthew Darga (P, D)
Quality Manager
HOFLEY MFG CO
22534 Groesbeck Hwy
Warren, MI 48089
(313) 778-5444
ID# 317

*BPI
Art Williams (D)
Quality Assurance Manager
GRANT INDUS INC
33415 Groesbeck Hwy
Fraser, MI 48026
(313) 293-9200

ID# 318
Roger Keranen (P)
Manager of Training
BRAUN ENG CO
19001 Glendale Ave
Detroit, MI 48223
(313) 270-1700
ID# 320

*BPI

Charles Beauchamp (D)
Quality Assurance Engineer
DEXTER FASTERNER TECHS
2110 Bishop Cir E
Dexter, MI 48130
(313) 426-5200
ID# 309

*BPI

Bruce Vik (P, U)
Superintendant of
Quality Assurance
GENERAL MOTORS CORP
3044 W Grand Blvd
Detroit, MI 48202
(313) 556-5000
ID# 321

Roebby Ledford (P, D)
Quality Systems Manager
OGURA CORP
631 Ajax Dr
Madison Hts, MI 48071
(313) 546-1450
ID# 304

Lee Johnson (P, D)
Quality Manager
DECO GRAND INC
4850 Coolidge Hwy
Royal Oak, MI 48073
(313) 435-0100
ID# 307

*BPI

Sal Licavoli (D)
Metallurgy Lab Supervisor
Walker Acquisition Corp.
Ferndale, MI 48220
(313) 399-4800
ID# 212

APPENDIX D
Quality Assurance Technician
Narratives from Employer Survey

**QUALITY ASSURANCE TECHNICIAN
NEEDS ASSESSMENT
EMPLOYER RESPONSES**

- 2. What are the main duties of your employees who work as Quality Assurance technicians?**
- 101 Work in lab; testing technicians. Work on floor; gather data; write job descriptions; inspect; write quality plans. Corporate advisory staff goes in if plant cannot handle the problem. Also, handles customer problems when the plant is unable to.
 - 102 Coating testing, metallurgical testing, integrity testing with respect to our product, Bundy weld tubes.
 - 103 Inspect parts, run coordinate optical measurement machine, do paper work.
 - 104 Check materials as they are processed, make sure right amount of adhesive is put on. Keeping up SPC, make sure they are charted correctly, do peel test, gauging, do dock audits, do proper certification with shipments, tracking down problems.
 - 105 Do dimensional checks which include blue prints and gauge, heavy emphasis on SPC, take corrective action.
 - 106 The full range of inspection work.
 - 107 Application of quality control. Measure parts. Interpret numbers, take corrective action. Determine good vs bad, calibration for government contracts, know job process, problem solving reject process and return to shipper.
 - 108 Do metrology side of business. Deal with customers issues, parts approval, processing, certification.
 - 109 Layout inspections, S.P.C. charting, graphing, interpretation, supplier activities.
 - 110 Incoming inspection; first piece inspection process and end inspection, certified goods, use gauge, calipers, coordinate measuring machine, SPC data collection - make charts graphs; control chemicals, take corrective action.
 - 111 Measurement work, record keeping, gauge calibration works, training of operators.
 - 112 Inspector of incoming raw materials. Inspector of processes, end product.
 - 113 Floor inspection, testing of parts, receiving - final inspections.

- 114 Go around to each job and do measurements. Some visual inspections - some using Caliper "Vernier." Input information into computer. Do blue print reading. Use a hand held calculator.
- 115 Receiving inspection, process inspection, S.P.C, send instruments to be calibrated Plotting; detailing.
- 116 Lab work, sample submission, lay out parts, put packages together.
- 117 Some receiving, audits, dock audits, computer input, programming, charting, graphing, take measurements.
- 118 Sample packages, working with foreman and supervisors to assure the quality of parts that parts meet standards requirements, make sure that parts are ready.
- 119 Take initial samples, assess and monitor quality, assist with S.P.C.
- 120 Inspect parts, measure parts.
- 121 Physically taking measurements, wet chemical analysis.
- 122 Input reports for non-conformance, supplier certification, material review, identify parts.
- 123 Layout inspection, inspection of on-line parts by dimension. Oversee S.P.C. Finish - last inspection.
- 124 Check raw materials in tanks, make critical and significant inspections, various duties assigned by supervisor, inspect processes.
- 125 Statistical checks, incoming product check, finished goods check.
- 126 Active inspections, make charts, statistics, chart long-term trends.
- 201 All that it takes to control product quality.
- 202 Chemical testing, mechanical testing, process observations, order entry procedures; process control and improvements, S.P.C.
- 203 Steel sales representatives, deal with claims from vendors, rejects, quality problems, SPC programs, look at customer specs, do lab tests.
- 204 Some inspection, take measurements, does S.P.C., charts, hardness, testing.
- 205 Floor inspection, receiving inspection, S.P.C., layout.

- 206 Lab testing, calibration of test equipment, data collection, capability studies.
- 207 Observe and audit production. Test product before it is shipped, test for hardness/softness of material. Do high voltage tests. Test material used in production.
- 208 Visual and dimensional inspecting auditing.
- 209 S.P.C. functions, clerical work associated with S.P.C., data gathering - processing.
- 210 All employees are quality managers. Maintain quality manual. Work with employee involvement program, work with outside consulting firm.
- 211 Raw material inspection, in-process inspection; (getting away from final inspection); Detail lay -out for sample submission; Computer data entry/charting.
- 212 Every employee is his own quality inspector. Computer data entry, S.P.C. charting graphing. Complying SPC data on computer, filing it for future (if need for documentation arises). Retrieving information.
- 213 Field investigation of failures.
- 214 Varies within different areas of company, lab testing, incoming inspection, supplier surveillance, S.P.C. Processing engineer responsibilities and activities.
- 215 In-process inspections/final inspections; initial sample inspection; recertification; take samples; S.P.C.; safety awareness.
- 216 Whole realm, track material, how it runs, chemistry, use gauges, make charts; test for tolerances.
- 217 Mass involvement in quality control. Do chemical, metallurgical tests, audits, SPC Charts, FEMA, write control plans; test carbon, phosphorus; acid concentrations, gas.
- 218 Analyze molten metal, sizing tests, production control, tell what is in scrap metal (inbound); check processes in plant; test finished goods.
- 301 Check layout gauges for parts any and all necessary checks for submission and first piece inspection.
- 302 Engine tear-down technicians. Dynamometer Cell technicians.
- 303 Check die molds, check fixtures, sheet metal parts, run CMM machine.
- 304 Incoming and exiting dimensional inspections; gauge control program; returned goods analysis; warranty analysis; In process quality; S.P.C. Charting and auditing; verifying charts.

- 305 Conduct tests that comply with federal, state and European regulations and customer requirements.
- 306 Have two categories: 1. Lab techs. 2. Metallurgists.
- 307 Inspect all parts; interpret to see if up to expectations; make decisions; do paper work.
- 308 Review SPC data, make final audits, make first piece inspections.
- 309 Inspections, machine work, S.P.C.
- 310 Check out parts, do layout, check decisions.
- 311 In manufacturing setting a technician works in inspection and prevention. Make checks at operational points, calibration program, statistics program, physical inspections, in-process inspections, make sample submissions, perform audits.
- 312 Customers quality problem solving, advanced quality planning, internal/external quality problem solving.
- 313 Approval and set-up, inspection, tracking of every part number, sample submissions, S.P.C.
- 314 Receiving inspection, machine audit, final lab testing, customer service work, educating the customer.
- 315 Dimensional inspections, final inspections, SPC, Gauge inspections.
- 316 Problem solving with customers, Responds to problems, Inspections SPC clerk; sample coordination.
- 317 SPC Coordination, Quality supervision, S.I.R. Coordinator, Sample, proto type submission.
- 318 1st piece inspection, last piece inspection (measurements testing)
- 319 First inspection. Heat treat last piece inspection (measurements testing in-process).
- 320 Gauge reliability inspections/studies - audit and measure incoming tooling. Corrective action for vendor certification process. Calibrate gauges-tag if pass. Audit final inspection before shipment. Route any return salvage upon area.
- 321 Focus is on process - ensure its under control.

10. What is the single most important quality, skill or characteristic you look for when hiring quality control/assurance personnel?

- 101 Ability to communicate clearly.
- 102 Inter-personal skills - how they communicate with others - past job skills.
- 103 Able to do "paperwork" - Attention to details, ability to translate paper work to other employees.
- 104 Ability to be trained.
- 105 Initiative, ability to work on own, ability to try something different-to make changes.
- 106 Attendance, initiative.
- 107 Independence.
- 108 Problem solving skills; team work.
- 109 Ability to develop into a team member.
- 110 Common sense.
- 111 Ability to act in a team environment we can train/teach the rest.
- 112 Reliability, loyalty to the company.
- 113 Bright, ambitious, think on feet, willing to learn, eagerness.
- 114 Ambitious.
- 115 Knowledge of statistics and how they are applied to a manufacturing concept.
- 116 Need an aggressive person, knowledgeable, self- starts, hard worker.
- 117 Communication.
- 118 Background, integrity.
- 119 How much expertise applicant can bring into company, problem solving techniques.
- 120 Eager to work, one who tries to correct mistakes tactfully.
- 121 Ability to learn.
- 122 Ability to think.

- 123 Ability to work in a team environment.
- 124 Good communication skills, able to check background.
- 125 Ability to work with others.
- 126 Initiative.
- 201 Mechanical background.
- 202 Educational background, ability to get along with people and become part of a team.
- 203 Ability to get along with people.
- 204 Attendance.
- 205 Confidence in ability to make decisions.
- 206 Ability to work as a team member.
- 207 Attendance, able to follow orders, being observant.
- 208 Ability to communicate.
- 209 Integrity.
- 210 Communication skills.
- 211 Communication, able to work on own, able to handle multiple priorities.
- 212 Attention to detail, ability to accurately gather information, reproduce data accurately.
- 213 Team work, problem solving in a group environment.
- 214 Communication skills.
- 215 Interest in quality, have the mind set, want to make this a career rather than just a job.
- 216 Team player, communication skills.
- 217 Problem solving.
- 218 Ability to take action in the event of a problem and do what is needed to correct it.
- 301 Interest and adaptability.
- 302 Thoroughness.

- 303 Ability to interpret the prints.
- 304 Attitude.
- 305 Education, communication skills, experience, problem solving skills, ability to conceptualize, able to reason logically.
- 306 Past experience, knowledge.
- 307 Self starter, able to work on own and with a group.
- 308 Experience.
- 309 Work as a team member able to work with other employees.
- 310 Experience.
- 311 Technical ability.
- 312 No one specific quality, look at the total person.
- 313 Ability to interact with other employees. Ability to "cover" every aspect of the manufacturing floor.
- 314 Common sense, recognizable ability.
- 315 Ability to understand manufacturing, blue print reading, attitude, team player.
- 316 No single one quality.
- 317 Common sense.
- 318 Wanting to do a good job, good education in Metrology SPC, aggressive, hands-on individual.
- 319 Experience and education - in Quality Assurance.
- 320 Inter - personal skills.
- 321 Interpersonal skills- We hire people that will have a future at GM.

11. **As part of our assessment, we are interested in understanding potential career paths for entry level personnel. Could you explain what advancement opportunities are available, with examples of typical job titles?**
- 101 Unlimited. Employee can bid on many jobs and are assured an interview (if qualified).
- 102 If you have degree beyond associate, may advance to sales, management, supervisory work, foreman.
- 103 Little at their plant, small operation, 45 employees, no supervisors.
- 104 No career path is charted in the company for hourly production workers.
- 105 Area leader, assistant manager, manager.
- 106 Quality Control Manager.
- 107 No job titles within company.
- 108 Within Quality Control description, Quality Engineer, Quality manager. Within Manufacturing to manufacturing engineer, manufacturing manager, manufacturing strategy engineer or manufacturing strategy manager, production supervisor, general superintendent, plant supervision, plant manager.
- 109 From technician (with added schooling) to Quality Assurance Engineering field which pays about \$50/60,000, then to management.
- 110 Leaders, Supervision, Quality assurance Coordinator or director. Possible advancement to newly arising jobs.
- 111 Without added education; technical analyst, math, more education, engineering, manufacturing supervision.
- 112 Quality Control Manager.
- 113 May become a machine operator, injection press operator, go into management.
- 114 Auditor to floor inspection, layout and lab. technician, Quality Manager.
- 115 To Quality Control Manager.
- 116 Openings posted to employees first (have 3 plants); usually promote from within; some go to Engineering Staff.
- 117 Corporation is growing - may move up as high as ability/knowledge warrants. Corporation promotes from within first.

- 118 With additional education, depending on ability, ambition can move up in the Corporation
- Corporation tries first to promote from within.
- 119 Can go into Quality Engineering, Quality Assurance Assistant, Manager's Assistant;
Manager.
- 120 Small company-not really room for advancement in this company. Retrain present
employees for openings.
- 121 Supervision, management. May move from manufacturing side to technical side of
business.
- 122 To administration (with proper education) to management.
- 123 Expect employees to become SPC certified, expect continuing education to advance to
Engineer; SPC Coordinator, Manager.
- 124 Leader, Coordinator, Supervisor, Manager.
- 125 Quality auditor; Senior Quality Tech (3 pay levels) on up to management.
- 126 Follow line of progression in plant helper, operator, lead person, direct supervision,
management, go into shipping, receiving, sales.
- 201 (A production shop) No job titles. General help, supervisor.
- 202 Unlimited: Technicians (as additional education and experience is gained) can advance if
they are accomplished and put out effort.
- 203 Outside quality service representative (3 positions) (small company).
- 204 Foreman; Assistant Superintendent.
- 205 "Small company" - floor inspector; statistics technician; assistant quality manager.
- 206 Quality engineer; Corporate Quality Engineer; Corporate Quality Manager.
- 207 Small company "not many."
- 208 Supervisor, Layout, Coordinator Machine Operator, Programmer.
- 209 Supervisors, Assistant Foreman, Foreman, General Foreman, Quality Manager, other
areas of management (depending on qualification and education). No limit.
- 210 Not much room in the company.

- 211 Mr. Predhomme went from clerk to supervisor (head of dept.) in 3 years (Has Industrial Engineering Degree from U of M).
- 212 With ASQC tech (money and position increases) to management. Vice President rose through ranks of Quality Control (with many college degrees).
- 213 Supervisor, Assistant Plant Manager, Plant Manager.
- 214 Manufacturing management, Plant management, go to purchasing areas, or sales areas.
- 216 As ability, knowledge increases one is promoted. One may go into sales, management - no limit.
- 217 Start as lab. technician, as gets more educated, go into Engineering status, take on more responsibilities - pay increases, go into upper management.
- 218 Unlimited with education, ability etc.
- 301 May progress into management: Assistant Quality Manager to Quality Manager.
- 302 No limit - may rise to president level.
- 303 All employees have to serve in the apprentice program. After completion they may advance to supervisor and manager.
- 304 (New company - 4 years old) No specific history of advancement. With proper education should be able to become a Quality Engineer.
- 305 1,200 workers. Inspectors; Senior inspector; Quality Engineer; Manager; Director of Quality.
- 306 (Company is 2 years old) No history of career paths. Assume it would be from techs to management with education, ability, ambition.
- 307 Machine operator; Supervisor; Product control expediter - may move to jobs in the plant or management.
- 308 Quality Engineer; Applications Engineer; Assistant Quality Control Manager; Quality Control Manager.
- 309 Quality Assurance Engineer. (New company, 3 years old, career paths are not presently clearly defined).
- 310 Supervisor, Inspector, Manager.
- 311 UAW and salary. There is a seldom an opportunity to switch. Inspector, technician, supervisor, engineering, manager.

- 312 Depends on education, ability and knowledge.
- 313 Quality Assurance Manager, Corporate Quality Manager.
- 314 Small company (30 years) can move in and out of quality to production area to management positions. Leader production, Quality inspector (all based on performance).
- 315 Small company (80 people) Receiving inspector; SPC Coordinator; Quality Control Engineer; Quality Manager.
- 316 No prescribed pattern - small company (300 people) there is room for advancement. Young and growing company.
- 317 Inspector, Coordinator, Supervisor, Quality Engineer.
- 318 Train them for advancement-raises.
- 319 Not much advancement.
- 320 Senior Tool & Gauge Technician. Quality administration - takes care of Supervision of Inspection quality.
- 321 Have regular programs-introduce them to all facets of business; 3-5 years 2-3 assignments.

13. What problems do you encounter?

- 101 Plants are located in rural areas (Kentucky, Ohio, Indiana etc.,). Sometimes can offer attractive salary package to entice qualified Q.A person to relocate.
- 102 Hired a metallurgical engineer with no Q.A. training and trained.
- 107 People who apply expect a "desk job."
- 109 Lack of training, experience.
- 110 Lack of education in area of inspection & blue print reading.
- 113 No skilled people.
- 114 Presently have an advertisement running in the paper, disappointed with the low number of applicants responding.
- 116 Some are under qualified, want too much money.
- 122 Not willing to start at low level (persons with technical & product knowledge).

- 123 Lack of education.
- 124 Don't want to work, not self motivated, claim to have experience (false.)
- 126 Lack of basic knowledge.
- 205 No one wants the job for the wage our company wants to pay. New hires usually have to work 2nd shift and no one wants that.
- 206 Plants are located in rural areas; Mexico, Arkansas, Georgia, Nebraska.
- 208 Finding people, not finding qualified people.
- 211 Most are over qualified. They quit company as soon as another job is offered to him.
- 212 Want more money.
- 214 Finding the right fit with combination of skills, knowledge to fit into the position available.
- 215 No background in Q.A. Do not understand the manufacturing mode.
- 217 Have very tight restrictions on who Rouge hires. Q.A. people speak for Rouge, deal with claims against Rouge-have to be top of the line.
- 307 People are not trained well.
- 308 Not enough applicants.
- 320 Trouble finding individuals. GDT skills appropriate, Math skills, whether something in out specs.

14. What, if any, specific skills do your entry level employees lack?

- 101 Can't read and write. In Morganfield, Ky., plant teaches remedial reading and writing to employees.
- 103 We train our people - presently have one woman doing the job.
- 104 Education: Math skills; SPC training.
- 109 Math; statistics.
- 113 No math, no high school diploma, poor past work performance, poor attitude.
- 114 Do not know how to use Vernier Caliper.

- 116 Not familiar with F.E.M.A. standards/requirements.
- 119 Lack total quality management training.
- 123 Blueprint reading.
- 124 Poor writing and verbal skills.
- 126 Mathematics skills.
- 204 Mathematics.
- 205 Computer skills-Use Word Perfect, Harvard Graphics.
- 206 Basic S.P.C. Inability to work in a team environment.
- 208 Cannot read blueprints; cannot communicate.
- 211 Not familiar with computer (not programming) should be aware of Industry Software.
- 212 No computer training. Do not know how to use computer software.
- 214 Written and communication skills.
- 215 No quality background.
- 217 Poor written and oral skills.
- 304 Gauge calibration procedures- measuring abilities.
- 307 Math, blueprint reading.
- 318 Manufacturing process. Speed of manufacturing.
- 320 Math skills.
- 321 Lacking in written communication -writing reports.

18. Can you describe the nature of the training?

- 101 Have a corporate training staff that teaches formal problem solving. Plus, numerous other classes. Company reimburses 75% of tuition for employees.
- 102 Procedures writing, Basic set of tools for quality.
- 103 Introduction to S.P.C.; how it works as far as distribution and control.

- 104 Sent to a client/customer who offered SPC training free (Customer name Aeroquip Corp).
- 105 SPC training in house (informal). Send to Ford Motor Co. for seminars.
- 106 SPC, how to measure, how critical things are determined, general concepts.
- 107 Use of mill standards (based on application/repetition); calibration and sampling standards. Receiving and inspection.
- 108 S.P.C. blue print reading; design of experiments.
- 109 Sponsor programs in manufacturing locations, basic S.P.C., DFMA (design/manufacturing).
- 110 Tuition reimbursement for employees (external). Internal: Basic training meetings, S.P.C., data gathering.
- 111 In house, with the exception of electricity, all of the subjects listed in Question 15. External use consultants for design of experiments work.
- 112 External seminars where needed.
- 113 Quality Control Manager trains employees.
- 114 S.P.C.; blue print reading.
- 115 How to read/record measurements and come up with averages.
- 116 Have one man (in house) who does training for new machines, new processes. Used outside consultants in past.
- 117 All new hires received 4 hours of Basic S.P.C. and problem solving training.
- 118 Has Total Quality Management. Group made up of people from academia for employees to call on for training both hands on and theoretical training. Teach primarily D.O.E.
- 119 Purchased an Excel training package-use that to train in plants.
- 120 Caliper training, S.P.C.
- 121 Internal and External SPC training; problem solving training.
- 123 Send to OCC; Eastern Mich. Univ.; Wayne CC; Wayne State, Oakland Univ for classes. External an Internal classes on Metrology; Management skills; D.O.E.; Computers skills.
- 124 Train new people (in house) in use of measuring machines/instruments. Attend Dunn and Bradstreet seminars. Classes at area colleges and universities.

- 125 Internal: Training in S.P.C. and 90% of subjects already listed. External: Use "PAULSON tapes" and attend some workshops/seminars.
- 126 Vendors supply training in S.P.C.
- 201 In quality procedures.
- 202 Not on a regular basis. Sent a group to Oakland University for SPC.
- 203 Quality Manager comes from Rouge Steel - conducts classes in quality management; SPC; chemical analysis. Have gone to almost every college and university in state for training.
- 204 Have been sending people to OCC. Presently sending some to Macomb ("they have a good program there"). Teach Basic classes; SPC.
- 205 Informal SPC. Go to Macomb CC (They are nearby). Tuition reimbursement.
- 206 Have a corporate training staff (most training handled through them). Introduction to Quality Philosophy, SPC, D.O.E., Metrology.
- 208 In-house training in GD&T; SPC; Coordinate Measuring Machine. External: CMM from Geddings and Lewis.
- 209 In house: Classes in almost all subjects previously listed and management techniques. External: Attend seminars put on by Perry Johnson Co.; American supplier Institute, M.S.U. Management Education Center.
- 210 External: Work with consulting firm OEM Ominex. Internal: SPC.
- 211 Internal: New employees have 1/2 day training in basic SPC. External: SPC training recently had a consultant come in to train in GDT. Consultant; Effective Training , Inc., Westland, MI.
- 212 External: Juran put on a seminar on problem solving. Internal: One day seminars on SPC.
- 214 To all employees: Internal: Total Quality Management, Statistics; S.P.C.; D.O.E.; External: Supplements Statistics, Interpersonal personal skills. Use: Covey Leadership, Provo, Utah.
- 215 Tuition reimbursement and attend seminars.
- 216 External; tuition reimbursement program. Internal: personal development, product training.
- 217 "Magnitude of things"- S.P.C.; D.O.E; electrical. Have an internal training staff.

- 301 In house: SPC; Blue Print Reading; Geometric Tolerancing training. External: Henry Ford CC seminar put on by American Supplier Institute; ASQC.
- 303 External: Tuition reimbursement. Internal: SPC Refresher; Cross training in salt spray technology, Vernier Caliper; Shadow graphing.
- 304 In house: Problem solving techniques; Inspection techniques; Computer programming in SPC. External: SPC refresher and metrology from manufacturer of equipment (Mitutoya Co.). Use a GD&T tape from an engineering society.
- 305 In house: Product related seminars and 20 different related classes in metal forming; GD&T; Metrology; plating processes (even though they do not plate); Shadow graphs; Applied Statistics; SPC.
- 307 In house: DOE, QFD, math, blue print reading, English as a second language. External: OCC; Michigan State University.
- 308 American Supplier Institute; attend Ford and GM seminars.
- 309 In house: Training in SPC; FEMA; DOE. External: Seminars put on by University of Michigan.
- 311 All employees go through standard training in GD&T; Blue Print Reading; Inspection Procedures; Statistics; Employee involvement training. External: attend seminars (no one particular).
- 312 In house: Big 3 people come in to present 3-day seminar. External: Go to Macomb CC for SPC, Metrology, GD&T, Total Quality Management.
- 313 In house: SPC; Operator training and other classes as needed. External: Company has tuition reimbursement-if class applies to company's needs, will pay.
- 314 In house: S.P.C.
- 315 External: Tuition reimbursement. In house: SPC refresher; Cross-training in salt spray technology; Vernier Caliper; Shadow graphing.
- 316 External: Use Perry Johnson Co. for communication skills, problem solving skills.
- 317 S.P.C. training.
- 318 Covers everything if needed, Manager conducts training on as need basis. Continue education with Macomb-keep up good grades.
- 319 SPC training at a local high school (Mercy High School) Port Huron Community College - Marysville skill CTR.

- 320 In-house: On-staff personal-computer literacy, SPC, Material handling, gauge management, inspection techniques. External: College Algebra, Trig, Blue print reading, GPsT, seminars, Schoolcraft, Henry Ford, Lawrence Tech.
- 321 In-House: GM has built in training - SPC. External: Macomb Community College.

APPENDIX E
Quality Assurance Technician
Student Survey

1. What was your primary reason for taking Quality Assurance Technician courses at OCC?
(Let the respondent answer and then check all that apply.)

- To obtain a degree or certificate.
 To complete courses necessary for transfer to another college.
 To prepare for a new career.
 To improve your knowledge, technical skill or competency for your job.
 To comply with your employer's requirements.
 To increase your chances for a raise and/or promotion.
 For personal development.
 Other. _____

2. What is your current employment situation?

- 1 Employed full-time.
 2 Employed part-time.
 3 Unemployed. *Not employed but actively seeking employment (Go to question 5)*
 4 Not employed and not seeking employment, *(because of choice.) (Go to question 5)*

3. What is your current occupation/job title?

4. Is your current employment related to the quality assurance coursework you have taken at OCC?

- 1 Yes 0 No.

5. How do you plan to use the knowledge and skills gained in your Quality Assurance Technician courses at OCC in the future?

6. Is/was Quality Assurance Technician your major field of study at OCC?

- 1 Yes (Skip to Question 8) 0 No

7. What is/was your major field of study? _____

8. Has/Is the Quality Assurance Technician program at OCC met/meeting your expectations?

- 1 Yes 0 No 8 Unknown

9. Please rate your level of satisfaction with the following aspects of the Quality Assurance Technician program at OCC using the scale, 5=Very satisfied, 4=Satisfied, 3=Neutral, 2=Dissatisfied, 1=Very Dissatisfied.

	<i>Very Satisfied</i>	<i>Satisfied</i>	<i>Neutral</i>	<i>Dissatisfied</i>	<i>Very Dissatisfied</i>
a) The variety of Quality Assurance Technician courses offered	5	4	3	2	1
b) The content of Quality Assurance Technician courses taken	5	4	3	2	1
c) The scheduling of Quality Assurance Technician courses	5	4	3	2	1
d) The quality of faculty/instruction in the Quality Assurance Technician program	5	4	3	2	1
e) The availability of up-to-date technology/laboratory facilities	5	4	3	2	1
f) The quality of textbooks in the Quality Assurance Technician program	5	4	3	2	1

10. What do you or did you most like about the Quality Assurance Technician course/program?

11. What do you or did you most dislike about the Quality Assurance Technician course/program?

12. Are there any specific recommendations you would like to make to improve the Quality Assurance Technician program at OCC?

13. Is there any other comment you would like to make about the Quality Assurance Technician program at OCC?

"This concludes the survey. Thank you very much for taking the time to speak with me about your experience in OCC's Quality Assurance Technician program. I'm sure the information you have provided will be useful to us as we complete the needs assessment for that program."

9. Please rate your level of satisfaction with the following aspects of the Quality Assurance Technician program at OCC using the scale, 5=Very satisfied, 4=Satisfied, 3=Neutral, 2=Dissatisfied, 1=Very Dissatisfied.

	<i>Very Satisfied</i>	<i>Satisfied</i>	<i>Neutral</i>	<i>Dissatisfied</i>	<i>Very Dissatisfied</i>
a) The variety of Quality Assurance Technician courses offered	5	4	3	2	1
b) The content of Quality Assurance Technician courses taken	5	4	3	2	1
c) The scheduling of Quality Assurance Technician courses	5	4	3	2	1
d) The quality of faculty/instruction in the Quality Assurance Technician program	5	4	3	2	1
e) The availability of up-to-date technology/laboratory facilities	5	4	3	2	1
(f) The quality of textbooks in the Quality Assurance Technician program	5	4	3	2	1

10. What do you or did you most like about the Quality Assurance Technician course/program?

11. What do you or did you most dislike about the Quality Assurance Technician course/program?

12. Are there any specific recommendations you would like to make to improve the Quality Assurance Technician program at OCC?

13. Is there any other comment you would like to make about the Quality Assurance Technician program at OCC?

"This concludes the survey. Thank you very much for taking the time to speak with me about your experience in OCC's Quality Assurance Technician program. I'm sure the information you have provided will be useful to us as we complete the needs assessment for that program."

APPENDIX F
Narratives from Student Survey

**QUALITY ASSURANCE TECHNICIAN
STUDENT SURVEY RESPONSES**

3. What is your current occupation/job title?

- 01 Project engineer - Quality Management for facility
- 02 Quality control Inspector GM
- 03 Assembler - at GM
- 04 Purchasing Agent- GM (28 years)
- 05 Process Control Inspector
- 06 Domino's Pizza
- 07 Customer Service Representative- Fluid Power Distributor
- 08 Quality Engineer
- 09 Coordinate Measuring Machine Programmer
- 10 Quality Engineer
- 11 Tool Room Supervisor
- 12 Sales Engineer
- 13 Quality Assurance Supervisor
- 14 Machinist
- 15 Processing Engineer
- 16 Layout Technician - Quality Control
- 17 Automotive Designer
- 18 Assembly Technician
- 19 Computerized Numerical Control Specialist
- 20 Welder
- 21 Quality Control-Laboratory Inspector
- 23 Inspector
- 24 Inspector
- 26 Owner of Grinding Shop
- 27 Quality Coordinator of Paint Department
- 28 Job Setter
- 29 Engineering Administrator
- 30 Quality Assurance Auditor
- 31 Manufacturing Technician
- 32 Machinist
- 33 Quality Control Technician
- 34 CMM Operator
- 35 Quality Control Supervisor
- 36 Draftsman (Body fixtures, layout)
- 37 GM Bus-Truck
- 38 Floor Inspector
- 40 Compliance Auditor
- 41 Quality Assurance Technician

- 5. How do you plan to use the knowledge and skills gained in your Quality Assurance Technician courses at OCC in the future?**
- 01 To further career- continue at OCC until achieve an AA degree in Quality Assurance Technician.
 - 02 Improve career path at present job.
 - 03 Further opportunities at work
 - 04 To further improve opportunities
 - 05 To improve knowledge for work.
 - 06 Would like to do job as a Quality Manager, on to Engineering degree.
 - 07 Prepare for future quality position
 - 08 For promotion, to put on resume
 - 09 Use in job. Plan to enhance skills (in future) by returning to OCC to take more classes.
 - 10 Use it daily in my job. It enables me have my job.
 - 11 Design and develop tooling for job.
 - 12 Some of the courses can be applied to future degree in robotics
 - 13 Use every day-that's what I do for a living.
 - 14 Use in major field of study-transfer credits to Lawrence Tech. (Shops are converting to SPC, if go to another job, wise be able to fit in.)
 - 15 To prepare for a new career in Quality Control.
 - 16 To better myself, to advance in field.
 - 17 Use knowledge and skills every day in job.
 - 18 It was taken as an elective class-do not plan to pursue that career field.
 - 19 Hope to continue education to earn a degree and perhaps to seek employment in Quality Control area.
 - 20 To look for better employment
 - 21 To help my company-apply knowledge gained to my job and use it day-to-day to get a more professional view point of quality control.
 - 22 Not sure yet.
 - 23 Move from Inspector to a Quality Manager (advance within the company)
 - 24 Not too sure yet, wants to learn something about the field.
 - 25 Wants to obtain a 2 year degree and then obtain an Engineering degree.
 - 26 Just improving knowledge for this business.
 - 27 Pursue a Master's degree and advance within the corporation.
 - 28 Plan to advance to supervisor and obtain a Bachelors in Industrial Management.
 - 29 For this job (improve knowledge)
 - 30 Obtain a 4 Year degree (management).
 - 31 Wants to be prepared to take the Quality Certified Exam.
 - 32 Acquire an Assurance Quality Control Laboratory Technician qualification.
 - 33 Obtain a 2 year degree.
 - 34 Not sure yet.
 - 35 I will use it on a daily basis at this job.
 - 36 For his own personal use (on the job).
 - 37 To get a raise and promotion.
 - 38 Transfer to a higher paying position.
 - 39 To move up the Corporate ladder.
 - 40 To gain a better position.
 - 41 To gain a higher paying position.

- 10 What do you or did you most like about the Quality Assurance Technician Course/program?
- 01 QAT 100 & QAT 104 were "great"
- 02 Last couple of courses involving hands on classroom work, tours of plants.
- 03 The way the program is broken down to explain each element of what one needs to know, new teachers are really good, direct application at work.
- 04 The GDNT class was very helpful-good instructor.
- 05 Help better understanding at work. QAT 104.
- 06 Some good classes. 3 of 4 instructors are good.
- 07 Interesting field-very involved-great instructor, real life examples.
- 09 Program is geared toward learning, teachers are available to answer students' questions. Equipment is available. Students can learn as much as they are willing to push themselves.
- 10 The Geometric tolerance class. The instructor knew the subject, got a laboratory out of the class.
- 11 The instructor was very knowledgeable. She permitted students to bring in blue prints-she would explain then to the class and help the individual and explain them.
- 13 Learned quite a lot. Use knowledge every day.
- 14 Liked having teachers who worked in the field of Quality Control. Teachers were open, willing to answer questions. Quality teachers.
- 15 Liked having the knowledge that I gained from the class.
- 16 Covered all that I was looking for in the class. Class gave insight on the things I needed to know to do my job in Quality Control.
- 17 Taught me what I needed to know to get a good job.
- 18 It was an open class-could express opinions freely in class. Could relate class work to experiences on job. Instructor asked students to relate class work to job and speak about it in class.
- 19 It was educational. Company converting over to Quality Control could apply what was learned to job.
- 20 Nothing in particular.
- 21 Got an overall view of all aspects of Quality Control. Course gave me "good tools" to work with. Gave good understanding of how to work with statistical charts.
- 22 Instructors seem to be good-textbooks not too good.
- 25 Instructors are good.
- 27 Instructors are good.
- 29 Instructors are good.
- 30 Instructors are easy to understand.
- 31 Instructors are good.
- 33 Mr.Mike Kidd, Miss Wesley , both are knowledgeable,both could help to reorganize the curriculum.
- 34 Liked the course and the teacher.
- 35 Mike Kidd- instructor very good, he should be director of the program.
- 36 Everything -the course was good.(I only took one course).
- 37 The program is interesting.
- 38 I am happy with the program. I have taken only two classes.
- 39 Teachers were great.
- 40 The teachers and staff were very helpful.

- 41 I have been employed as Quality Assurance Technician for over 20 years, I am trying to get my degree. The program is interesting but should be upgraded.
- 11 What do you or did you most dislike about the Quality Assurance Technician course program?**
- 01 Limited use of tools and availability of lab.
- 02 The quality seminar book did not meet the classroom criterion.
- 03 Books for first two courses (QAT 100,101) not very good. The last full time instructor wasn't good-could not communicate with students at their level.
- 04 The first textbook-QAT100,101 was pitiful.
- 05 Cancelled classes-getting classes you need, 2-3 classes didn't learn a thing.
- 06 Outdated textbooks- classrooms could be better.
- 08 Lack of skills of teachers. Got "ripped off" by taking GD&T class. Whole class signed a petition to get rid of teacher. Dean was made aware of the problem. OCC did nothing. Teachers read word for word from the text.
- 09 Need to up-grade some of the equipment (the machines). The market is expanding quickly, OCC needs to keep up with the market place (in the technology).
- 10 The teacher from India was hard to understand- his board work was good. His accent was the problem.
- 11 GDT class needs to be more in-depth. (Should offer a #2 class to follow the first one to accomplish this). First GDT class and content were good.
- 12 Need more hands-on application rather than only reading a manual. Need to show actual plant applications. Need to go into field to find out about current applications of material.
- 13 Provide quality teachers. Some didn't know anything. Teachers from the industry were great.
- 14 Class sequencing poor. Class scheduling sporadic. Materials were not always available.
- 15 The equipment was not up-to-date. Wanted more computer time (in class.) Did not have enough equipment.
- 18 Instructor was "dry"; he dragged out material that was in the text book. Material was outdated-it was 1950's technology. Book was outdated.
- 19 Too much crammed into 15 weeks.
- 21 The class was presented in a factory setting not in a classroom setting. There was machinery and air hoses (noise level high) around. Even the instructor commented that the setting was not good.
- 22 Very disappointed with the program-not well organized. He wants to get his associate degree in 2 years but won't be finished-no summer courses and only 1 course in the Spring.
- 23 Textbooks outdated-no lab facilities available.
- 25 Scheduling is poor-not easy to complete the program because of scheduling, not enough courses offered.
- 26 Quality Survey Course-poor textbook outdated-need a new textbook.
- 27 Not enough courses offered, course material was outdated (1987-not current).
- 28 Not enough people registered for courses, disorganized program.
- 31 Textbooks outdated.
- 32 Courses use same material. No laboratories or equipment available-what is there is outdated.
- 33 Scheduling is bad-courses never offered, equipment and books very bad.

- 35 Textbooks-outdated needs more courses-better variety needed.
- 37 The scheduling is terrible.
- 39 No film presentation.
- 41 Some teachers are not knowledgeable about the program.

12 Are there any specific recommendations you would like to make to improve in the Quality Assurance Technician program at OCC?

- 01 Needs a full time technician to help in laboratory.
- 02 Not really- except Mike Kidd and Wesley are great instructors.
- 03 Should have at least, one full time instructor on staff, more classes at more times.
- 04 GD&T- Should be two Semesters. QAT100 + 101, needs new book.
- 06 Get teachers who know what they are doing, get organized-needs a full time person.
- 07 Come up with better classrooms- better books.
- 08 Look at Macomb Community College program. Mold OCC's after that. It's well organized -it's great.
- 09 Incorporate more machines into the instruction- have more hands on teaching.
- 10 Need more hands on. Would like to take a part, take measurement on it; take figures on it.
- 13 Watch the teachers. Offer good ones.
- 14 Offer classes at 100-200 levels in sequence, during more semesters.
- 16 Instructor should put more emphasis on the need for quality- that's how Japan got where it is, auto companies need to stress quality.
- 17 Provide more courses.
- 18 Get an up-to-date text book.
- 20 Offer more classes. None offered in Summer Semester.
- 21 No Quality Control Classes offered in Spring and Summer Semesters. Classes are offered only at Auburn Hills- would prefer Royal Oak Campus.
- 22 Re-structure the program. He has talked to Bill Rose-no help.
- 23 About the laboratory facilities and textbooks.
- 25 Selection and availability of the courses needs to be improved.
- 29 No laboratories are provided, textbooks are terribly outdated.
- 31 Courses offered at other campuses besides Auburn Hills (long drive for him).
- 32 Very disorganized- no direction- textbooks so outdated that they don't even apply.
- 34 Limited curriculum-needs to expand-needs more advanced courses.
- 35 Change and re-vamp the program.
- 37 Some of the classes are dry and do not have anything to do with the program.
- 41 OCC should update the program, textbooks and programming material needed.

13 Is there any other comment you would like to make about the Quality Assurance Technician program at OCC?

- 01 Hopes to continue with program. Good program.
- 03 Overall the program is good. I have recommended this program at work.
- 04 Not at this time.
- 06 Develop a Blue Print Reading Course.

- 08 Because of bad experiences will not attend OCC in the future.
- 10 Send flyers to companies telling of the program; Quality Supervisor was not aware that OCC had a Quality Control Course/Program. Companies need Quality Control instructions for the employees.
- 11 Offer an additional GDT class.
- 12 Wants to take more classes in Quality Control in future.
- 13 Would like to see more classes (more variety) offered during Winter & Spring Semesters.
- 14 Change all the above.
- 16 OCC should approach businesses to push Quality Control classes so OCC can offer more classes.
- 17 Add more in-depth classes. Offer better scheduling.
- 21 Mr.Kidd, instructor showed many aspects of Quality Control. He gave a good understanding of all aspects. Very satisfied. Beneficial to me in my job.
- 22 Possibly transferring to Mott College in Flint.
- 26 No comments. I have taken 2 courses so far.
- 28 Hopefully it is going in a good direction with the new director, Mike Kidd.
- 30 GDT course instructor very good. Ann, female-doesn't remember name.
- 32 Metallurgy-he is taking at Macomb Community College because it is not available here. Very disorganized-no direction, textbooks so outdated that they don't even apply. One makes predictions about the economy in the 1980's. Curriculum is very lousy. Transferring to Macomb Community College.
- 35 In order to pass the Board Certified Exam-need better courses at OCC. Macomb Community College offers an excellent program and they take the field of Quality Control very seriously, it is important in our society-OCC does not take it seriously.
- 37 The Administration Staff should update and clean the program up.
- 39 Not very happy with the program.

APPENDIX G
AMERICAN SOCIETY FOR QUALITY CONTROL CERTIFICATION

AMERICAN SOCIETY FOR QUALITY CONTROL CERTIFICATION

Certification is formal recognition by the American Society For Quality Control (ASQC) that an individual has demonstrated a proficiency within and comprehension of a specified body of knowledge at a point in time. It is peer recognition and not registration of licensure.

Certified Quality Auditor...is a professional who understands the standards and principles of auditing and the auditing techniques of examining, questioning, evaluating, and reporting to determine a quality system's adequacy and deficiencies. The Certified Quality Auditor analyzes all elements of a quality system and judges its degree of adherence to the criteria of industrial management and quality evaluation and control systems.

Certified Quality Technician...is a paraprofessional who, in support of and under the direction of Quality Engineers or Supervisors, uses, in a responsible manner, proven techniques that make up the body of knowledge recognized by those who are experts in quality technology. Under professional direction or supervision, the quality technician analyzes and solves quality problems, prepares inspection plans and instructions, selects sampling plan applications, prepares procedures, trains inspectors, performs audits, analyzes quality costs and other quality data, and applies fundamental statistical methods for process control.

Certified Mechanical Inspector...is an inspector with the necessary knowledge and industrial experience to pass the certification examination. In support of and under the direction of quality engineers, supervisors, or technicians, this inspector can use, in a responsible manner, the proven techniques included in the Body of Knowledge. Under professional direction, the Mechanical Inspector evaluates hardware documentation, performs laboratory procedures, inspects products, measures process performance, records data, and prepares formal reports.

Certified Reliability Engineer...is a professional who understands the principles of performance evaluation and prediction to improve product/systems safety, reliability, and maintainability. This body of knowledge and applied technologies includes but is not limited to design review and control; prediction, estimation, and apportionment methodology; failure mode effects and criticality analysis; the planning operation and analysis of reliability testing and field failures, including mathematical modeling; understanding human factors in reliability; the ability to develop and administer reliability information systems for failure analysis, design and performance improvement, and reliability program management over the entire product life cycle.

Certified Quality Engineer...is a professional who understands the principles of product and service quality evaluation and control. This body of knowledge and applied technologies include, but are not limited to: development and operation of quality control systems; application and analysis of testing and inspection procedures; the ability to use metrology and statistical methods to diagnose and correct improper quality control practices; an understanding of human factors and motivation; facility with quality cost concepts and techniques; the knowledge and ability to develop and administer management information systems and to audit quality systems for deficiency identification and correction.