Oakland Community College
Robotics Needs Assessment
Employer Survey

We at OCC are currently contacting southeast Michigan businesses which build, service or use robotic equipment. Do you have a moment to answer a few questions for us?

1. Please tell me which of the following categories best describes your organization *(read all choices; circle one response)*:

a. Robot manufacturer *(skip to 4)*
b. Robot distributor *(skip to 4)*
c. Robot accessory equipment supplier *(skip to 4)*
d. Systems integrator *(skip to 4)*
e. Robotic safety equipment supplier *(skip to 4)*
f. Machine vision manufacturer *(skip to 4)*
g. Machine vision distributor *(skip to 4)*
h. Machine vision accessory equipment supplier *(skip to 4)*
i. Consultant *(skip to 4)*
j. Robot user

2. Does your organization employ robotics technicians and/or service people to maintain robotic equipment?
(If yes: Are these technicians/service people on staff, or are they outside consultants/manufacturer's representatives?)

1 _____ Yes, we have technicians/service people on staff *(Skip to #4)*
2 _____ Yes, we employ outside consultants or manufacturer's representatives to address equipment problems
3 _____ No, we do not employ any technicians or service people (discontinue survey)

3. Which firm or organization do you use to solve equipment problems?

*(write in name)*_____

4. What is the total number of people employed at your facility?

_____ (write in number)

5. When your organization hires people in the robotics area, what is the minimum level of education required?

1 _____*No specific educational requirement*
2 _____*High school diploma or equivalent*
3 _____*Associate degree*
4 _____*Bachelor's degree*
5 _____*Master's degree or higher*
6 _____*Other (please specify:)* _____

6. We would like to find out which skills and competencies are important to you when hiring new employees in the robotics area. Please tell me whether the following skills are very important, somewhat important, or unimportant:

	VI	SI	NI	No response
Understanding of repeatability and its importance	3	2	1	9
Understanding of interfacing between robot controller & peripheral components	3	2	1	9
Safety skills when working in close proximity to robot and teaching a program	3	2	1	9
Understanding of GAS METAL ARC WELDING (GMAW)	3	2	1	9
Use of proper joint design	3	2	1	9
Understanding of weld positions w/ reference to correct weld parameters	3	2	1	9
Understanding of sensor usage to prevent entry into a active robots work cell	3	2	1	9
Understanding of reasons why sensors are used in automation	3	2	1	9
Knowledge of the three categories of sensors used in manufacturing systems	3	2	1	9
Safety procedures involved in troubleshooting automation controllers	3	2	1	9
Proper use of multi-meter & record values at test points on AC input board	3	2	1	9
Use of error codes and diagnostics in troubleshooting procedures	3	2	1	9

7. When hiring new employees in the robotics area, would you say that most candidates are adequately trained in the following areas, or do you find that the majority are inadequately trained:

	Inadequate	*Adequate*	*No response*
a. Robot safety	1	2	9
b. Mechanical design/adjustments	1	2	9
c. Sensor selection/installation	1	2	9
d. End effector nomenclature/installation	1	2	9
e. Controller architecture	1	2	9
f. Controller/manipulator installation	1	2	9
g. Preventative maintenance	1	2	9
h. PLC installation/diagnostics	1	2	9
i. Troubleshooting/diagnostics	1	2	9
j. Interpretation of schematics	1	2	9

8. Are there other skills or competencies which you look for when hiring new employees in the robotics area?

_____

_____

9 . Are you currently hiring new employees in the robotics area?

1 _____ Yes, currently hiring in robotics
0 _____ No, not currently hiring in robotics *(skip to 11)*
7 _____ Don't know *(skip to 11)*
9 _____ No response *(skip to 11)*

10. What is the primary reason for hiring new employees in this area?

	Yes	No
a. Expansion of the company	1	0
b. Employee turnover	1	0
c. Need people trained in new technologies	1	0

d. Other: please specify:_____

11. What is the starting salary range in your organization for **entry-level** employees in the robotic area?

a. *From* _____ *to* _____ *per hour or*

b. *From* _____ *to* _____ *per year*

not coded
data entered

12. If one or more of your current employees in the robotic area were to obtain training in a community college robotics program, it is likely that their income would be affected substantially, slightly, or not all?

1 _____ Substantial increase in income
2 _____ Slight increase in income
3 _____ No change in income

13. If one or more of your current employees in the robotics area were to participate in a community college robotics program, how might their potential for career advancement be affected?

1 _____ Would not affect career advancement potential
2 _____ Might increase career advancement potential
3 _____ Would definitely increase career advancement potential
7 _____ Don't know
9 _____ No response

14. Does your organization provide any form of tuition assistance to employees in the robotics area who are interested in enrolling in outside training programs?

1 _____ Yes
0 _____ No
7 _____ Don't know
9 _____ No response

15. Does your organization provide any on-the-job training to employees in the robotics area?

1 _____ Yes
0 _____ No *(skip to 17)*
7 _____ Don't know
9 _____ No response

16. Could you describe the type of training you offer?

_____

_____

17. Thinking about the next five to ten years, do you predict that employment opportunities in the robotics area will increase, decrease, or remain about the same?

3 _____ *Increase*
2 _____ *Remain about the same*
1 _____ *Decrease*
7 _____ *Don't know*
9 _____ *No response*

18. Would you be interested in working with OCC to develop the robotics program?

1 _____ *Yes*
0 _____ *No*
7 _____ *Don't know*
9 _____ *No response*

19. Are there any other comments you would like to make about your employment needs or the training available?

1 _____ *Yes*
0 _____ *No*
9 _____ *No response*

_____

_____

Thank you very much for your time and assistance. Your responses will be very helpful to OCC in the development of the Robotics program.

Interviewer Signature: _____

Date: _____

Robotics Employers Surveyed

ACE Controls Inc
Farmington Hills, MI
810 476-0213
Contact: Dave Haslam

Motoman, Inc.
Waterford, MI
513 847-3204
Contact:Diandra Meyers

Carpenter Entrepreneurs
Fenton, MI
810 629-5891
Contact:Brian Pait

Albar Industries
Lapeer, M
810 667-0150
Contact: Greg Rahn

Airflow Research and
Manufacturing
Belleville, MI
313 397-1660
Contact: Rich Matsu

Robotics Production
Technology, Inc
Madison Heights, MI
810 583-2185

Trellis Software and Controls
Rochester Hills, MI
810 853-0700
Contact: Tim Schiller

Therabotics /Dynamic Control
Warren, MI
810 759-2540
Contact: Bob Weins

TL International
Madison Heights, MI
810 585-3140
Contact: Rob Cera

TEC Automation Inc
Wixom, MI
810 960-7575
Contact: Bob Todd

Robotics Technology Inc
Clinton Twp., MI
810 469-0290

Adept Technology, Inc
Novi, MI
810 348-5888
Contact: Jim Mathis

Questech, Inc
810 615-0800
Contact: George Emanoil

Nachi Robot Systems, Inc
810 305-6545
Contact: Susan Merritt

Automation Products Corp.
810 294-9500
Contact: Mike Blean

FANUC Robotics Inc
810 377-7000
Contact: Mikki Prokach

Ford Motor Compnay
Wayne, MI
313 467-0305
Contact: Sam Perron

Control Devices Inc
810 239-3101
Contact: Mr. Windsor

International Star Corp.
810 949-2200
Contact: Dee Drott

Chrysler Corp.
Sterling Heights
810 978-6113
Contact: Phil Osmundson

Power Surge
Orion, MI
810 391-6133
Contact:
Harold Fitzpatrick

Robotic Concepts, Inc
Livonia, MI
313 425-5599
Contact: John Powell

Wellington Industries Inc
Belleville, MI
810 942-1060
Contact: Mark Roggero

Crescive Die and Tool
Saline, MI
313 944-1222

Cordell Corp.
Rochester, MI
810 853-3494

Blechert, Inc.
Sterling Heights, MI
810 726-8717
Contact: Mike O'Brien

AMP Industries
Harrison Twp, MI
810 469-4100
Contact: Larry Lambert

Saturn Corp.
Troy, MI
810 524-6982
Contact: Rick Youngblood

Aeroquip, Inc.
Port Huron, MI
810 984-4446

Plymouth-Wayne Welding
Supplies Inc
Garden City, MI
313 425-8870
Contact: Dale Buhoski

Milford Fabricating
313 372-8400
Contact: Walt Anderson

AEP Technologies
810 294-6000

Precision Tool
Farmington Hills
810 471-0360

US Manufacturing
810 984-4145
Contact: Plant Manager

(Names in bold type are interested in working with OCC.)

Textron Automotive Interiors
Westland, MI
313 721-1000
Contact: Bill Martin

Logic Systems
Oxford, MI
810 628-2878
Contact: Pam Knasinski

Misui and Co USA
Southfield, MI
810 357-3300
Contact: Joe Carfora

Flotronics
Clarkston, MI
810 625-8890
Contact: Lloyd Schamaltz

ABB Robotics
Auburn Hills, MI
810 391-8567
Contact: Charlie Miller

Pico Resources
Royal Oak, MI
810 435-4100
Contact: Mark Stroup

RPT Co
810 583-2185
Contact:Chuck Russo

Aetna Industries Inc.
810 759-2200
Contact: Dan Done

Letts Industries
313 579-1100
Contact: Jeff Bolton

Scandmac Inc
313 421-7540
Contact: David Miller

Servicon Co
Roseville, MI
810 294-1860
Contact: Tony Moceri

Aerotek
Southfield, MI
810 575-9222
Contact: Curtis Heart

Perceptron
Farmington Hills, MI
810 478-7710
Contact: Jill Smith

Tokico USA Inc
Dearborn, MI
810 336-5280
Contact: James Bilski

Reis Machines Inc
Novi, MI
810 349-9220
Contact: Ryan Gilson

Creative Automation Inc
Plymouth, MI
313 455-4448
Contact: Brad Helm

Budd Co/Detroit Stamping
Detroit, MI
313 823-9100
Contact: Yvonne Snell

Watson Engineering
313 946-9856
Contact: George Jasowick

General Motors
Orion, MI
810 377 5164
Contact: Shawn Davis

General Motors
Flint, MI
810 236-7272
Contact: Personnel Office

Chrysler Stamping
Warren, MI
810 497-3685
Contact: Tom Begeman

Marubeni Corp.
810 355-6450
Contact: Steve Glouack

Quasar Industries
Rochester Hills, MI
810 852-0300
Contact: Mark Bartoski

Hi-Tech Toll Industries Inc.
Troy, MI
810 649-0690
Contact: Dennis Dawes

AGS Metal
810 939-3000
Contact: Mike Everett

Robotics Services
Grand Rapids, MI
616 954-0510
Contact: Randy French

Ingersoll-Rand Water-jet
Division
810 471-0888
Contact: Chuck Andromales

Draw-Tite
Canton, MI
810 722-7800
Contact: Jerry Brunette

BCR Tool Co
Brighton, MI
810 229-2580
Contact: Mike Gow

Dundee Research
Dundee, MI
313 529-2436
Contact: Danny King

Tower Automotive
Romulus, MI
313 946-1300
Contact: Carl Van Wagoner

Kawasaki Robotics USA
Farmington Hills, MI
810 477 3900
Contact: Bruce Moyrend

CD & A Industries
Huron Plastics Group Body
Systems
810 679-4887
Contact: Judy Vandewalker

(Names in bold type are interested in working with OCC.)

4/93

EXPECTED COMPETENCIES FOR ROB 250

This is a list of the expected student competencies for the Robotics 250 course. The student will have completed these expectations by the end of this course.

AT THE END OF THE ROB 250 COURSE THE STUDENT WILL BE ABLE TO:

1. write a summary paper on a current robot product line and the type of controller being used

2. explain proper safety procedures involved in troubleshooting automation controllers

GMF R-C CONTROLLER

3. write and execute a program in the GMF R-C language that will test the I/O configuration of the controller

4. explain the AC distribution for the R-C controller

5. list the test points for the AC distribution on the R-C controller and the values that should be found (480 input)

6. list the fuses, their values, and why they are in the circuit for the AC input board

7. explain the troubleshooting procedures for the AC input board

8. demonstrate proper and safe use of the multi-meter and record values at the test points on the AC input board

9. troubleshoot and correct problems involving the AC board

10. explain DC distribution, test points, fusing and adjustments on the R-C power supply board

11. explain the troubleshooting procedures for the power supply

12. use multi-meter and record voltages on power supply

13. list the connectors on the master printed circuit board and their functions

CATA robot manufacturer

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	61	89.7	89.7	89.7
yes	1	7	10.3	10.3	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

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CATB robot distributor

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	60	88.2	88.2	88.2
yes	1	8	11.8	11.8	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

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CATC robot accessory equipment supplier

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	57	83.8	83.8	83.8
yes	1	11	16.2	16.2	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

CATD systems integrator

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	53	77.9	77.9	77.9
yes	1	15	22.1	22.1	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

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CATE robotic safety equipment supplier

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	67	98.5	98.5	98.5
yes	1	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

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CATF machine vision manufacturer

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	66	97.1	97.1	97.1
yes	1	2	2.9	2.9	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

CATG machine vision distributor

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	67	98.5	98.5	98.5
yes	1	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

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CATH machine vision accessory equipment suppl

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	67	98.5	98.5	98.5
yes	1	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

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CATI consultant

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	59	86.8	86.8	86.8
yes	1	9	13.2	13.2	100.0
	Total	68	100.0	100.0	

Valid cases 68 Missing cases 0

TRAIN10 SCHEMATICS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	19	27.9	33.3	33.3
SATISFACTORY	2	38	55.9	66.7	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	8	11.8	Missing	
	Total	68	100.0	100.0	

Valid cases 57 Missing cases 11

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HIRING are you currently hiring new employees i

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	34	50.0	52.3	52.3
yes	1	27	39.7	41.5	93.8
don't know	7	4	5.9	6.2	100.0
	8	3	4.4	Missing	
	Total	68	100.0	100.0	

Valid cases 65 Missing cases 3

- -

EXPANS expansion of the company

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	3	4.4	10.7	10.7
yes	1	25	36.8	89.3	100.0
does not apply	8	40	58.8	Missing	
	Total	68	100.0	100.0	

Valid cases 28 Missing cases 40

TURNOVER employee turnover

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	14	20.6	51.9	51.9
yes	1	13	19.1	48.1	100.0
does not apply	8	40	58.8	Missing	
no response	9	1	1.5	Missing	
	Total	68	100.0	100.0	

Valid cases 27 Missing cases 41

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NEWTECH need people trained in new technologies

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	10	14.7	35.7	35.7
yes	1	18	26.5	64.3	100.0
does not apply	8	40	58.8	Missing	
	Total	68	100.0	100.0	

Valid cases 28 Missing cases 40

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INCOME if employees were to obtain cc training,

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
sustantial increase	1	17	25.0	27.4	27.4
slight increase in i	2	29	42.6	46.8	74.2
no change in income	3	16	23.5	25.8	100.0
	8	3	4.4	Missing	
	9	3	4.4	Missing	
	Total	68	100.0	100.0	

Valid cases 62 Missing cases 6

ADVANCE if employee particpated in cc training,

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
would not affect pot	1	11	16.2	17.7	17.7
might increase poten	2	30	44.1	48.4	66.1
would definitely inc	3	20	29.4	32.3	98.4
don't know	7	1	1.5	1.6	100.0
	8	3	4.4	Missing	
no response	9	3	4.4	Missing	
	Total	68	100.0	100.0	

Valid cases 62 Missing cases 6

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TUITION does organization provide tuition assist

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	15	22.1	23.4	23.4
yes	1	49	72.1	76.6	100.0
	8	3	4.4	Missing	
	9	1	1.5	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4

- -

TRAINING does organization provide on the job tra

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	7	10.3	10.9	10.9
yes	1	57	83.8	89.1	100.0
	8	3	4.4	Missing	
	9	1	1.5	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4

PREDICT do you predict that employment opportuni

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
remain about the sam	2	3	4.4	4.8	4.8
increase	3	58	85.3	92.1	96.8
don't know	7	2	2.9	3.2	100.0
	8	3	4.4	Missing	
	9	2	2.9	Missing	
	Total	68	100.0	100.0	

Valid cases 63 Missing cases 5

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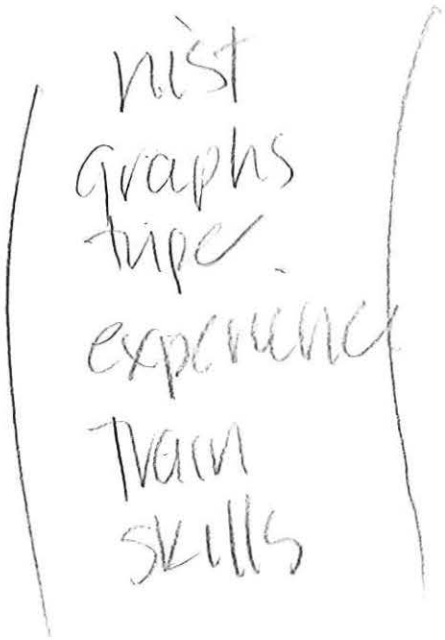
WORKOCC would you be interested in working with

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	19	27.9	29.7	29.7
yes	1	38	55.9	59.4	89.1
don't know	7	7	10.3	10.9	100.0
	8	3	4.4	Missing	
	9	1	1.5	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4



TRAIN1 ROBOT SAFETY

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	25	36.8	44.6	44.6
SATISFACTORY	2	31	45.6	55.4	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	9	13.2	Missing	
	Total	68	100.0	100.0	

Valid cases 56 Missing cases 12

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TRAIN2 MECHANICAL DESIGN

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	28	41.2	50.9	50.9
SATISFACTORY	2	27	39.7	49.1	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	10	14.7	Missing	
	Total	68	100.0	100.0	

Valid cases 55 Missing cases 13

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TRAIN3 SENSOR SELECTION

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	31	45.6	60.8	60.8
SATISFACTORY	2	20	29.4	39.2	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	14	20.6	Missing	
	Total	68	100.0	100.0	

Valid cases 51 Missing cases 17

TRAIN4 END EFFECTOR NOMENCLATURE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	34	50.0	70.8	70.8
SATISFACTORY	2	14	20.6	29.2	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	17	25.0	Missing	
	Total	68	100.0	100.0	

Valid cases 48 Missing cases 20

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TRAIN5 CONTROLLER ARCHITECTURE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	33	48.5	64.7	64.7
SATISFACTORY	2	18	26.5	35.3	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	14	20.6	Missing	
	Total	68	100.0	100.0	

Valid cases 51 Missing cases 17

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TRAIN6 MANIPULATOR INSTALLATION

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	25	36.8	54.3	54.3
SATISFACTORY	2	21	30.9	45.7	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	19	27.9	Missing	
	Total	68	100.0	100.0	

Valid cases 46 Missing cases 22

TRAIN7 PREVENTATIVE MAINTENANCE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	25	36.8	45.5	45.5
SATISFACTORY	2	30	44.1	54.5	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	10	14.7	Missing	
	Total	68	100.0	100.0	

Valid cases 55 Missing cases 13

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TRAIN8 PLC INSTALLATION

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	28	41.2	51.9	51.9
SATISFACTORY	2	26	38.2	48.1	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	11	16.2	Missing	
	Total	68	100.0	100.0	

Valid cases 54 Missing cases 14

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TRAIN9 TROUBLESHOOTING

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
UNSATISFACTORY	1	26	38.2	44.8	44.8
SATISFACTORY	2	32	47.1	55.2	100.0
DID NOT COVER/DOES N	8	3	4.4	Missing	
	9	7	10.3	Missing	
	Total	68	100.0	100.0	

Valid cases 58 Missing cases 10

SKILL1 REPEATABILITY

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AT ALL IMPORTANT	1	7	10.3	11.3	11.3
SOMEWHAT IMPORTANT	2	18	26.5	29.0	40.3
VERY IMPORTANT	3	37	54.4	59.7	100.0
DOES NOT APPLY	8	3	4.4	Missing	
	9	3	4.4	Missing	
	Total	68	100.0	100.0	

Valid cases 62 Missing cases 6

SKILL2 INTERFACING

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AT ALL IMPORTANT	1	4	5.9	6.3	6.3
SOMEWHAT IMPORTANT	2	13	19.1	20.3	26.6
VERY IMPORTANT	3	47	69.1	73.4	100.0
DOES NOT APPLY	8	3	4.4	Missing	
	9	1	1.5	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4

SKILL3 SAFETY SKILLS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AT ALL IMPORTANT	1	3	4.4	4.7	4.7
SOMEWHAT IMPORTANT	2	12	17.6	18.8	23.4
VERY IMPORTANT	3	49	72.1	76.6	100.0
DOES NOT APPLY	8	3	4.4	Missing	
	9	1	1.5	Missing	
	Total	68	100.0	100.0	

Valid cases 64 Missing cases 4

SKILL4 gmaw

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AT ALL IMPORTANT	1	25	36.8	40.3	40.3
SOMEWHAT IMPORTANT	2	21	30.9	33.9	74.2
VERY IMPORTANT	3	16	23.5	25.8	100.0
DOES NOT APPLY	8	3	4.4	Missing	
	9	3	4.4	Missing	
	Total	68	100.0	100.0	

Valid cases 62 Missing cases 6

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SKILL5 JOINT DESIGN

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AT ALL IMPORTANT	1	18	26.5	29.5	29.5
SOMEWHAT IMPORTANT	2	36	52.9	59.0	88.5
VERY IMPORTANT	3	7	10.3	11.5	100.0
DOES NOT APPLY	8	3	4.4	Missing	
	9	4	5.9	Missing	
	Total	68	100.0	100.0	

Valid cases 61 Missing cases 7

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SKILL6 WELD POSITIONS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AT ALL IMPORTANT	1	20	29.4	31.7	31.7
SOMEWHAT IMPORTANT	2	17	25.0	27.0	58.7
VERY IMPORTANT	3	26	38.2	41.3	100.0
DOES NOT APPLY	8	3	4.4	Missing	
	9	2	2.9	Missing	
	Total	68	100.0	100.0	

Valid cases 63 Missing cases 5