

Godbe Research & Analysis

FULL REPORT

Survey of Employers

**Conducted for the
Orange County Workforce Investment
Board**

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Table of Contents

List of Figures	ii
List of Tables	iii
Biomedical Industry	1
Biomedical Industry Occupational Assessment	3
Communications Industry	19
Communications Occupational Assessment.....	21
Computer Hardware and Electronics.....	36
Computer Hardware and Electronics Occupational Assessment	38
Computer Software.....	53
Computer Software Occupational Assessment	55
Construction	70
Construction Occupational Assessment	72
Defense and Aerospace Industry.....	87
Defense and Aerospace Industry Occupational Assessment	89
Energy and Environmental Services	105
Energy and Environmental Services Occupational Assessment	107
Health Services	119
Health Services Occupational Assessment.....	121
Professional & Business Services	136
Professional and Business Services Occupational Assessment	138
Tourism.....	156
Tourism Occupational Assessment	158

List of Figures

Figure 1.	Frequency of Employee Development Practices	2
Figure 2.	Difficulty Finding Experienced Applicants.....	5
Figure 3.	Difficulty Finding Non-Experienced Applicants	6
Figure 4.	Recruitment Outside of Orange County	6
Figure 5.	Frequency of Hiring Part-Time Employees.....	7
Figure 6.	Frequency of Hiring Temporary Employees	8
Figure 7.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	8
Figure 8.	Mean Education Requirements by Occupation	9
Figure 9.	Experience Requirements by Occupation	10
Figure 10.	Assemblers & Fabricators - Skill Importance and Deficiency	11
Figure 11.	Optical Goods Workers: Skill Importance and Deficiency	12
Figure 12.	Sales Representatives: Skill Importance and Deficiency	12
Figure 13.	Chemists: Skill Importance and Deficiency.....	13
Figure 14.	Chemical Technicians: Skill Importance and Deficiency.....	13
Figure 15.	Product Inspectors, Testers, Graders: Skill Importance and Deficiency.....	14
Figure 16.	Biological Scientists: Skill Importance and Deficiency	14
Figure 17.	Physical Scientists: Skill Importance and Deficiency	15
Figure 18.	Medical, Clinical Lab Technologists: Skill Importance and Deficiency	15
Figure 19.	Quality Assurance Auditors: Skill Importance and Deficiency	16
Figure 20.	Frequency of Employee Development Practices	20
Figure 21.	Difficulty Finding Experienced Applicants.....	22
Figure 22.	Difficulty Finding Non-Experienced Applicants	23
Figure 23.	Recruitment Outside of Orange County	24
Figure 24.	Frequency of Hiring Part-Time Employees.....	25
Figure 25.	Frequency of Hiring Temporary Employees	26
Figure 26.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	26
Figure 27.	Mean Education Requirements by Occupation	27
Figure 28.	Experience Requirements by Occupation	28
Figure 29.	Production Inspectors, Testers, and Graders - Skill Importance and Deficiency.....	29
Figure 30.	Electrical and Electronic Equipment Assemblers: Skill Importance and Deficiency.....	30
Figure 31.	Electrical and Electronic Technicians: Skill Importance and Deficiency	30
Figure 32.	Telephone and Cable Installers: Skill Importance and Deficiency	31

Figure 33.	Service Representatives: Skill Importance and Deficiency	31
Figure 34.	Field Engineers: Skill Importance and Deficiency	32
Figure 35.	Digital and Hardware Engineers: Skill Importance and Deficiency	32
Figure 36.	Software Engineers: Skill Importance and Deficiency	33
Figure 37.	Communications Systems Engineers: Skill Importance and Deficiency	33
Figure 38.	Frequency of Employee Development Practices	37
Figure 39.	Difficulty Finding Experienced Applicants.....	39
Figure 40.	Difficulty Finding Non-Experienced Applicants	40
Figure 41.	Recruitment Outside of Orange County	41
Figure 42.	Frequency of Hiring Part-Time Employees.....	42
Figure 43.	Frequency of Hiring Temporary Employees	43
Figure 44.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	43
Figure 45.	Mean Education Requirements by Occupation	44
Figure 46.	Experience Requirements by Occupation	45
Figure 47.	Electrical Engineers - Skill Importance and Deficiency.....	46
Figure 48.	Electrical Technologists: Skill Importance and Deficiency.....	47
Figure 49.	Electrical Technicians: Skill Importance and Deficiency	47
Figure 50.	Electrical Assemblers: Skill Importance and Deficiency.....	48
Figure 51.	Sales Engineers: Skill Importance and Deficiency	48
Figure 52.	Sales Representatives: Skill Importance and Deficiency	49
Figure 53.	ASIC Engineers: Skill Importance and Deficiency	49
Figure 54.	Facility or Quality Control Managers: Skill Importance and Deficiency	50
Figure 55.	Frequency of Employee Development Practices	54
Figure 56.	Difficulty Finding Experienced Applicants.....	56
Figure 57.	Difficulty Finding Non-Experienced Applicants	57
Figure 58.	Recruitment Outside of Orange County	58
Figure 59.	Frequency of Hiring Part-Time Employees.....	59
Figure 60.	Frequency of Hiring Temporary Employees	60
Figure 61.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	60
Figure 62.	Mean Education Requirements by Occupation	61
Figure 63.	Experience Requirements by Occupation	62
Figure 64.	Software Engineers: Skill Importance and Deficiency	63
Figure 65.	Systems Administrators / DB Administrators: Skill Importance and Deficiency.....	64
Figure 66.	Customer Support Specialists: Skill Importance and Deficiency	64

Figure 67.	Project Managers: Skill Importance and Deficiency	65
Figure 68.	Technical Writers: Skill Importance and Deficiency	65
Figure 69.	Sales Representatives: Skill Importance and Deficiency	66
Figure 70.	Inspectors, Testers, and QA Auditors: Skill Importance and Deficiency.....	66
Figure 71.	Network or Systems Administrators: Skill Importance and Deficiency.....	67
Figure 72.	Data Entry Keyers: Skill Importance and Deficiency	67
Figure 73.	Frequency of Employee Development Practices	71
Figure 74.	Difficulty Finding Experienced Applicants.....	74
Figure 75.	Difficulty Finding Non-Experienced Applicants	74
Figure 76.	Recruitment Outside of Orange County	75
Figure 77.	Frequency of Hiring Part-Time Employees.....	76
Figure 78.	Frequency of Hiring Temporary Employees	77
Figure 79.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	77
Figure 80.	Mean Education Requirements by Occupation	78
Figure 81.	Experience Requirements by Occupation	79
Figure 82.	Carpenters: Skill Importance and Deficiency	80
Figure 83.	Drywall Installers and Tapers: Skill Importance and Deficiency	81
Figure 84.	Plumbers, Pipefitters, and Steamfitters: Skill Importance and Deficiency	81
Figure 85.	Electricians: Skill Importance and Deficiency.....	82
Figure 86.	Cement Masons: Skill Importance and Deficiency	82
Figure 87.	Painters and Paperhangers: Skill Importance and Deficiency	83
Figure 88.	Operating Engineers or Construction Machine Operators: Skill Importance and Deficiency ..	83
Figure 89.	Construction Managers: Skill Importance and Deficiency.....	84
Figure 90.	Roofers: Skill Importance and Deficiency	84
Figure 91.	Frequency of Employee Development Practices	88
Figure 92.	Difficulty Finding Experienced Applicants.....	91
Figure 93.	Difficulty Finding Non-Experienced Applicants	92
Figure 94.	Recruitment Outside of Orange County	92
Figure 95.	Frequency of Hiring Part-Time Employees.....	93
Figure 96.	Frequency of Hiring Temporary Employees	94
Figure 97.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	94
Figure 98.	Mean Education Requirements by Occupation	95
Figure 99.	Experience Requirements by Occupation	96
Figure 100.	General Machinists - Skill Importance and Deficiency.....	97
Figure 101.	Sheet Metal Mechanics and Welders: Skill Importance and Deficiency	98

Figure 102.	Assemblers and Fabricators: Skill Importance and Deficiency	98
Figure 103.	Electrical and Electronic Assemblers: Skill Importance and Deficiency	99
Figure 104.	Mechanical Engineers: Skill Importance and Deficiency	99
Figure 105.	Engineering Technicians: Skill Importance and Deficiency	100
Figure 106.	Electrical and Electronic Engineers: Skill Importance and Deficiency	100
Figure 107.	General Maintenance Repairers: Skill Importance and Deficiency	101
Figure 108.	Computer Engineers and Programmers: Skill Importance and Deficiency	101
Figure 109.	Inspectors and Testers: Skill Importance and Deficiency	102
Figure 110.	Frequency of Employee Development Practices	106
Figure 111.	Difficulty Finding Experienced Applicants	109
Figure 112.	Difficulty Finding Non-Experienced Applicants	109
Figure 113.	Recruitment Outside of Orange County	110
Figure 114.	Frequency of Hiring Part-Time Employees.....	111
Figure 115.	Frequency of Hiring Temporary Employees	112
Figure 116.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	112
Figure 117.	Mean Education Requirements by Occupation	113
Figure 118.	Experience Requirements by Occupation	114
Figure 119.	Environmental Analysts and Health Specialists - Skill Importance and Deficiency	115
Figure 120.	Refuse Collectors: Skill Importance and Deficiency	115
Figure 121.	Electrical and Electronic Engineers: Skill Importance and Deficiency	116
Figure 122.	Instrumentation and Calibration Technicians: Skill Importance and Deficiency	116
Figure 123.	Frequency of Employee Development Practices	120
Figure 124.	Difficulty Finding Experienced Applicants	123
Figure 125.	Difficulty Finding Non-Experienced Applicants	123
Figure 126.	Recruitment Outside of Orange County	124
Figure 127.	Frequency of Hiring Part-Time Employees.....	125
Figure 128.	Frequency of Hiring Temporary Employees	126
Figure 129.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	126
Figure 130.	Mean Education Requirements by Occupation	127
Figure 131.	Experience Requirements by Occupation	128
Figure 132.	Registered Nurses: Skill Importance and Deficiency	129
Figure 133.	Certified Nursing Aides: Skill Importance and Deficiency.....	130
Figure 134.	Licensed Vocational Nurses: Skill Importance and Deficiency	130

Figure 135.	Radiology Technologists: Skill Importance and Deficiency	131
Figure 136.	Physical Therapy Assistants: Skill Importance and Deficiency	131
Figure 137.	Certified Home Health Aides: Skill Importance and Deficiency	132
Figure 138.	Non-Certified Home Health Aides: Skill Importance and Deficiency	132
Figure 139.	Medical Assistants: Skill Importance and Deficiency	133
Figure 140.	Occupational Therapists: Skill Importance and Deficiency	133
Figure 141.	Frequency of Employee Development Practices	137
Figure 142.	Difficulty Finding Experienced Applicants	140
Figure 143.	Difficulty Finding Non-Experienced Applicants	141
Figure 144.	Recruitment Outside of Orange County	142
Figure 145.	Frequency of Hiring Part-Time Employees	143
Figure 146.	Frequency of Hiring Temporary Employees	144
Figure 147.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	144
Figure 148.	Mean Education Requirements by Occupation	145
Figure 149.	Experience Requirements by Occupation	146
Figure 150.	Financial Managers - Skill Importance and Deficiency.....	147
Figure 151.	Accountants and Auditors: Skill Importance and Deficiency	148
Figure 152.	Account Collectors: Skill Importance and Deficiency	148
Figure 153.	Accounting Clerks: Skill Importance and Deficiency	149
Figure 154.	Administrative Services Managers: Skill Importance and Deficiency	149
Figure 155.	Employment Interviewers: Skill Importance and Deficiency.....	150
Figure 156.	Drafters / Computer Assisted Drafters: Skill Importance and Deficiency	150
Figure 157.	Systems Analysts: Skill Importance and Deficiency	151
Figure 158.	Sales Agents: Skill Importance and Deficiency	151
Figure 159.	Telemarketers and Solicitors: Skill Importance and Deficiency	152
Figure 160.	Paralegal Personnel: Skill Importance and Deficiency.....	152
Figure 161.	Legal Secretaries: Skill Importance and Deficiency	153
Figure 162.	Frequency of Employee Development Practices	157
Figure 163.	Difficulty Finding Experienced Applicants.....	160
Figure 164.	Difficulty Finding Non-Experienced Applicants	160
Figure 165.	Recruitment Outside of Orange County	161
Figure 166.	Frequency of Hiring Part-Time Employees.....	162
Figure 167.	Frequency of Hiring Temporary Employees	163
Figure 168.	Percentage of Business Locations that Hire Non-English Speaking Applicants.....	163
Figure 169.	Mean Education Requirements by Occupation	164

Figure 170.	Experience Requirements by Occupation	165
Figure 171.	Amusement / Recreation Attendants: Skill Importance and Deficiency	166
Figure 172.	Cashiers: Skill Importance and Deficiency	167
Figure 173.	Guard / Watch Guards: Skill Importance and Deficiency	167
Figure 174.	Waiters and Waitresses: Skill Importance and Deficiency	168
Figure 175.	Food Preparation Workers: Skill Importance and Deficiency	168
Figure 176.	Restaurant Cooks: Skill Importance and Deficiency	169
Figure 177.	Food Service and Lodging Managers: Skill Importance and Deficiency	169
Figure 178.	Bartenders: Skill Importance and Deficiency	170
Figure 179.	Maid and Housekeeping Cleaners: Skill Importance and Deficiency	170

List of Tables

Table 1.	Industry Employment Practices	1
Table 2.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	2
Table 3.	Number of Employees Hired With H-1B Visas in the Last 12 Months	2
Table 4.	Occupational Retention, Turnover, and Growth for the Next 12 Months	4
Table 5.	Biomedical Industry Entry-Level and Experienced Annual Wages by Occupation	18
Table 6.	Industry Employment Practices	19
Table 7.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	20
Table 8.	Number of Employees Hired With H-1B Visas in the Last 12 Months	20
Table 9.	Occupational Retention, Turnover, and Growth for the Next 12 Months	21
Table 10.	Communication Industry Entry-Level and Experienced Annual Wages by Occupation	35
Table 11.	Industry Employment Practices	36
Table 12.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	37
Table 13.	Number of Employees Hired With H-1B Visas in the Last 12 Months	37
Table 14.	Occupational Retention, Turnover, and Growth for the Next 12 Months	38
Table 15.	Computer Hardware and Electronics Industry Entry-Level and Experienced Annual Wages by Occupation	52
Table 16.	Industry Employment Practices	53
Table 17.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	54
Table 18.	Number of Employees Hired With H-1B Visas in the Last 12 Months	54
Table 19.	Occupational Retention, Turnover, and Growth for the Next 12 Months	55
Table 20.	Computer Software Entry-Level and Experienced Annual Wages by Occupation	69
Table 21.	Industry Employment Practices	70
Table 22.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	71
Table 23.	Number of Employees Hired With H-1B Visas in the Last 12 Months	71
Table 24.	Occupational Retention, Turnover, and Growth for the Next 12 Months	73
Table 25.	Construction Entry-Level and Experienced Annual Wages by Occupation.....	86
Table 26.	Industry Employment Practices	87
Table 27.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	88
Table 28.	Number of Employees Hired With H-1B Visas in the Last 12 Months	88
Table 29.	Occupational Retention, Turnover, and Growth for the Next 12 Months	89
Table 30.	Defense and Aerospace Industry Entry-Level and Experienced Annual Wages by Occupation	104
Table 31.	Industry Employment Practices	105
Table 32.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	106
Table 33.	Number of Employees Hired With H-1B Visas in the Last 12 Months	106

Table 34.	Occupational Retention, Turnover, and Growth for the Next 12 Months.....	108
Table 35.	Energy and Environmental Services Industry Entry-Level and Experienced Annual Wages by Occupation.....	118
Table 36.	Industry Employment Practices	119
Table 37.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	120
Table 38.	Number of Employees Hired With H-1B Visas in the Last 12 Months	120
Table 39.	Occupational Retention, Turnover, and Growth for the Next 12 Months.....	122
Table 40.	Health Services Entry-Level and Experienced Annual Wages by Occupation	135
Table 41.	Industry Employment Practices	136
Table 42.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	137
Table 43.	Number of Employees Hired With H-1B Visas in the Last 12 Months	137
Table 44.	Occupational Retention, Turnover, and Growth for the Next 12 Months.....	139
Table 45.	Professional and Business Services Entry-Level and Experienced Annual Wages by Occupation.....	155
Table 46.	Industry Employment Practices	156
Table 47.	Number of Firms that Have Ever Used H-1B Visas to Hire Employees	157
Table 48.	Number of Employees Hired With H-1B Visas in the Last 12 Months	157
Table 49.	Occupational Retention, Turnover, and Growth for the Next 12 Months.....	159
Table 50.	Tourism Entry-Level and Experienced Annual Wages by Occupation.....	172

Biomedical Industry

The Biomedical (BIOM) cluster is a knowledge intensive industry that is made up of firms that research, manufacture, or process biological, chemical, and medical products.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 94 percent of BIOM employees worked full-time, six percent worked part-time, and six percent were temporary employees (see Table 1). The current workforce of over 28,000 employees is expected to increase by 14 percent in the next 12 monthsⁱ. The expected increase in industry employment represents over 3,800 new jobs for Orange County.

Table 1. Industry Employment Practicesⁱⁱ

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
BIOM	28,216	26,457 94%	1,759 6%	1,770 6%	3,836 14%

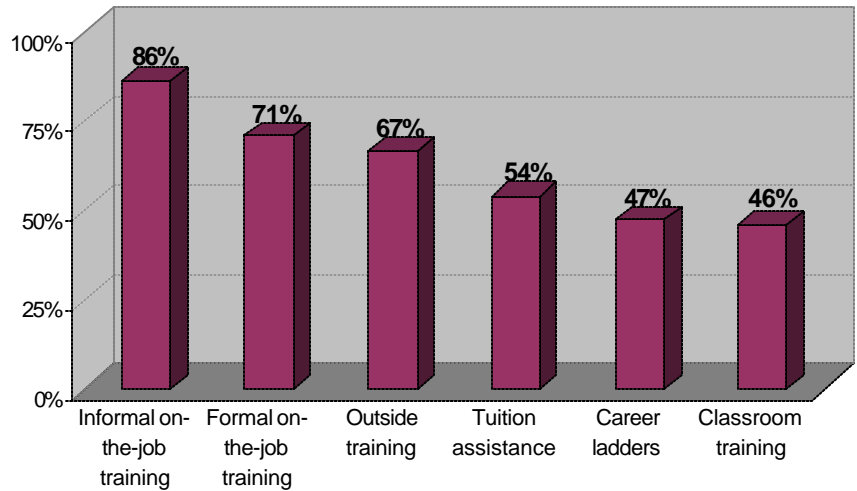
ⁱThe survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

ⁱⁱThroughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 86 percent of BIOM firms reported that they typically utilized informal on-the-job training at their business location, 71 percent used formal on-the-job training, 67 percent offered employer-paid outside training, 54 percent offered employees tuition assistance at a college or university, 47 percent used career development or career ladders, and 46 percent of BIOM firms utilized in-house classroom training (see Figure 1).

Figure 1. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 30 percent of Biomedical firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table 2). In the last 12 months, approximately one in every 51 employees within the Biomedical industry was hired using an H-1B Visa (see Table 3).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 2. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
224	768	29.17%

Table 3. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
551	28,216	1.95%

Biomedical Industry Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For the Biomedical Industry, the survey examined 10 occupations: Assemblers and Fabricators, Optical goods workers, Sales Representatives, Chemists, Chemical Technicians, Production Inspectors - Testers and Graders, Biological Scientists, Physical Scientists, Medical and Clinical Lab Technologists, and Quality Assurance Auditors. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the 10 occupations included in the BIOM survey. Respondents were then asked detailed, occupation-specific questions for as many as six occupations that were randomly selected among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Optical Goods workers and Chemical Technicians are expected to have the highest percentage turnover of the occupations examined (22% and 18%, respectively), whereas Physical Scientists (3%) and Medical and Clinical Lab Technologists (5%) should have the lowest. Biological Scientists and Product Inspectors, Testers, and Graders had the highest 12-month rate of expected growth among BIOM occupations, with 31 percent and 21 percent, respectively. Optical Goods workers and Assemblers and Fabricators (-4% and -3%, respectively) were the only BIOM occupations examined with negative expected growth over the next 12 months. Biological Scientists will have the most openings in the next 12 months (194) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table4).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 4. Occupational Retention, Turnover, and Growth for the Next 12 Monthsⁱⁱⁱ

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Biological Scientists	421	1.5%	15%	31%	194
Product Inspectors, Testers, Graders	478	1.7%	13%	21%	160
Quality Assurance Auditors	703	2.5%	9%	4%	93
Assemblers / Fabricators	2,002	7.1%	8%	-3%	89
Chemists	238	0.8%	11%	11%	53
Sales Representatives	1,286	4.6%	3%	0%	40
Chemical Technicians	221	0.8%	18%	0%	40
Optical Goods Workers	223	0.8%	22%	-4%	39
Physical Scientists	113	0.4%	0%	20%	23
Medical, Clinical Lab Technologists	328	1.2%	0%	2%	7
Cluster Total	28,216	100%	11%	14%	6,961

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

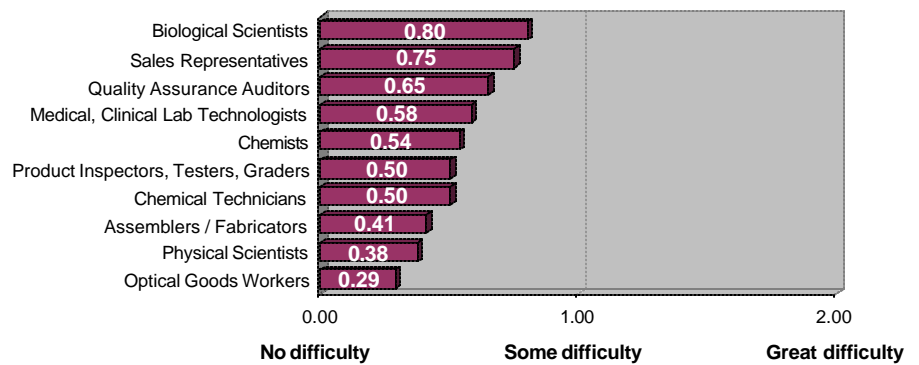
ⁱⁱⁱThe percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 10 BIOM occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. BIOM firms had the most difficulty locating experienced Biological Scientists (0.80), Sales Representatives (0.75), Quality Assurance Auditors (0.65), and Medical and Clinical Lab Technologists (0.58).

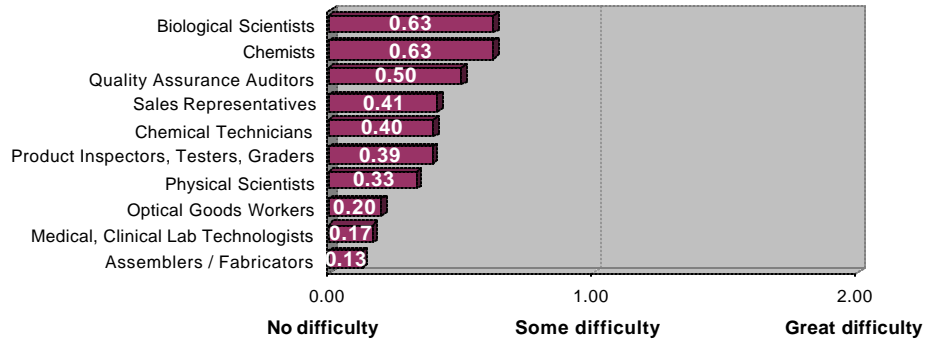
Figure 2. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Biological Scientists (0.63), Chemists (0.63), and Quality Assurance Auditors (0.53), whereas firms had little if any difficulty finding non-experienced Assemblers and Fabricators (0.13).

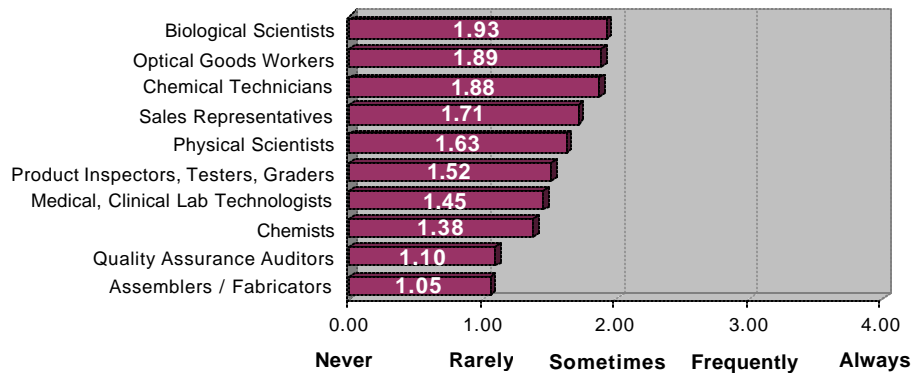
Figure 3. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale with ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Biological Scientists (1.93) were most often recruited from outside the County of the BIOM occupations examined, followed by Optical Goods workers (1.89), Chemical Technicians (1.88), and Sales Representatives (1.71). It should be noted that for all 10 of the occupations, firms ‘rarely’ to ‘sometimes’ recruited outside the County.

Figure 4. Recruitment Outside of Orange County

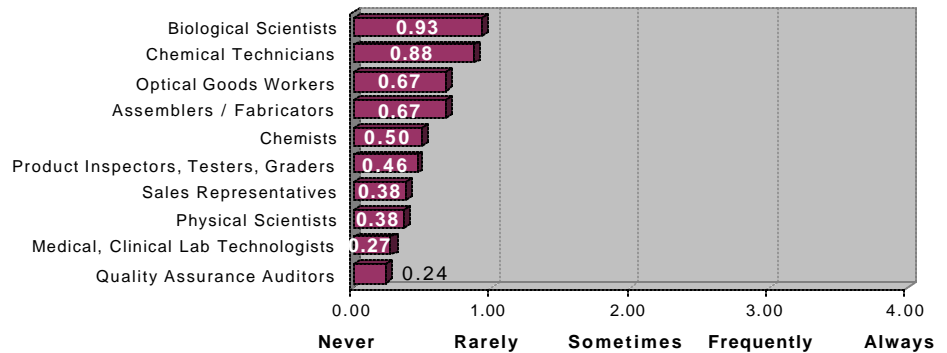


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Biological Scientists in part-time positions with greater frequency than they did any other BIOM occupation, but even so, their frequency of hiring part-time Biological Scientists still only averaged between 'rarely' and 'never' (0.93). For all ten of the BIOM occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure5).

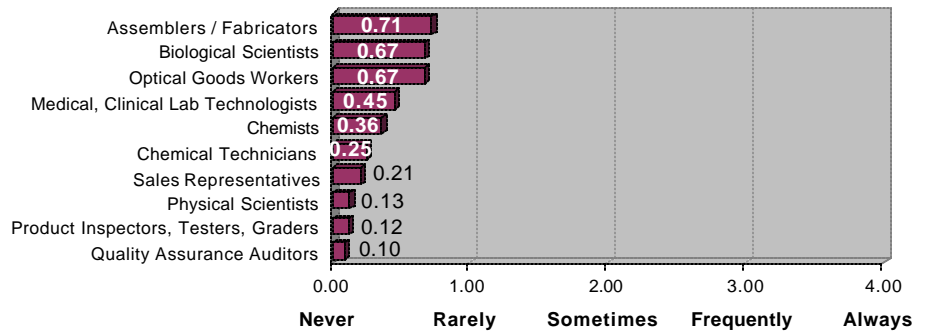
Figure 5. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Assemblers and Fabricators (0.71) were the occupation where temporary employees were most frequently hired, followed by Biological Scientists (0.67) and Optical Goods workers (0.67). It should be noted that the frequency of hiring temporary workers for each of the 10 BIOM occupations ranged between 'never' and 'rarely', with firms hiring temporary Quality Assurance Auditors (0.19) with the lowest frequency (see Figure 6).

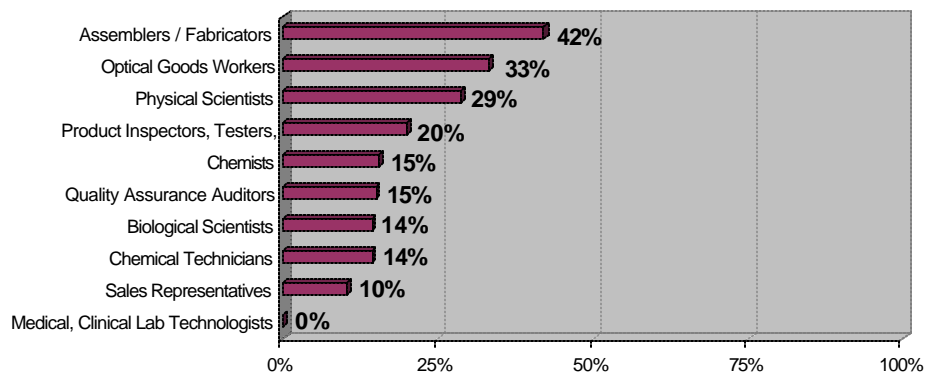
Figure 6. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the 10 BIOM occupations. Forty-two percent of firms hired non-English speaking Assemblers and Fabricators, followed by Optical Goods workers (33%), and Physical Scientists (29%). On the other end of the spectrum, none of the firms hired non-English speaking Medical and Clinical Lab Technologists.

Figure 7. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Biomedical Industry survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

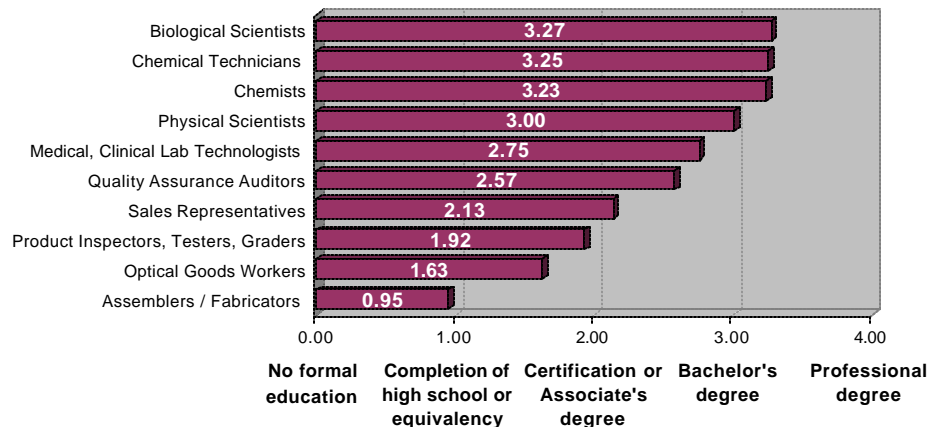
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the 10 BIOM occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Biological Scientists had the highest average education requirement (3.27), with most respondents agreeing the position required at least a Bachelor’s degree. Assemblers and Fabricators had the lowest average educational requirements (0.95), with respondents indicating that applicants needed, on average, slightly less than completion of high school or its equivalent to be successful. For four of the 10 positions examined, respondents indicated that at least a Bachelor’s degree was the average education level of successful applicants (see Figure8).

Figure 8. Mean Education Requirements by Occupation

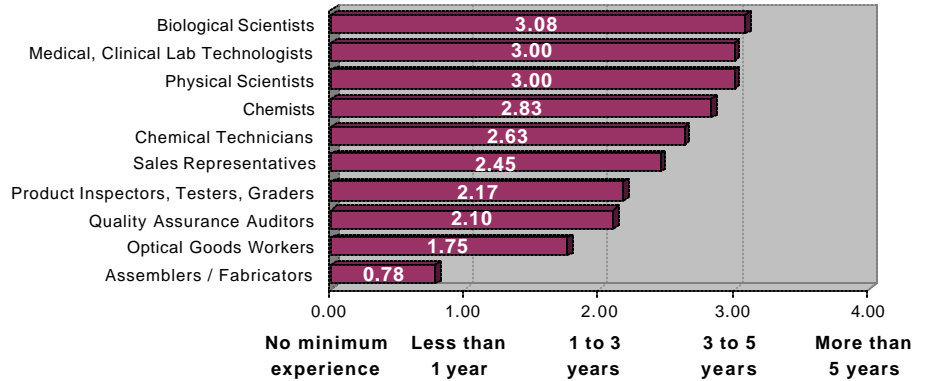


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to the experience question were coded according to a scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Biological Scientists had the highest average experience requirement (3.08) of the 10 occupations examined, followed by Medical and Clinical Lab Technologists (3.00), Physical Scientists (3.00), and Chemists (2.83). On the opposite end of the spectrum, Assemblers and Fabricators had the lowest average experience requirements (0.78) for applicants’ success (see Figure9).

Figure 9. Experience Requirements by Occupation



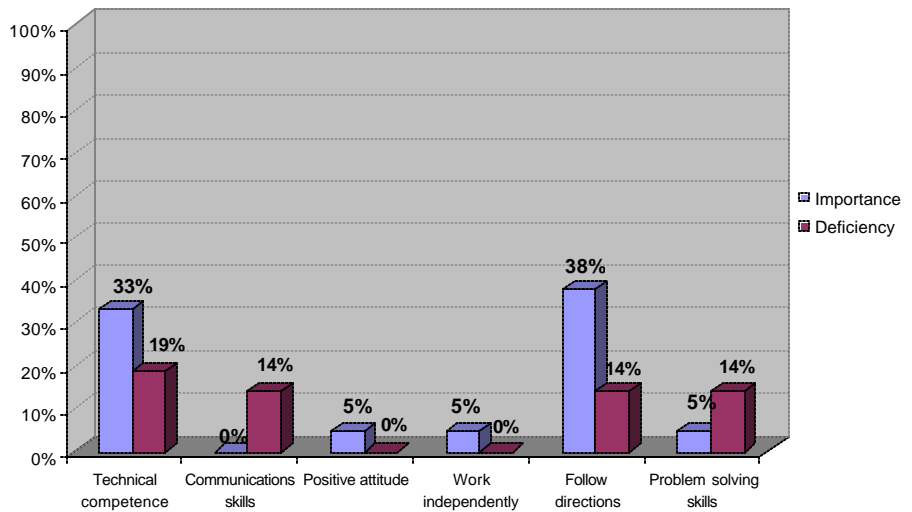
Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each BIOM occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

Seventy-three percent of firms felt technical competence specific to the position was the most important skill for Biological Scientists and only seven percent of firms felt that their Biological Scientists were currently most deficient in this skill. For Biological Scientists, almost half of BIOM firms (47%) indicated that 'Interpersonal communication skills' was the biggest deficiency for current employees in that occupation. For Product Inspectors, Testers and Graders, 73 percent of firms felt that technical competence specific to the position was most important and 38 percent of BIOM firms noted that employees were most deficient in communication skills. Figures 10 through 19 display skill importance and deficiency by each occupation^{iv}.

Figure 10. Assemblers & Fabricators - Skill Importance and Deficiency



^{iv}Note that percentages for Most Important Skill and Most Deficient Skill for each occupation do not necessarily equal 100 percent because some respondents replied 'Don't Know' or would not state any of the six general skill sets.

Figure 11. Optical Goods Workers: Skill Importance and Deficiency

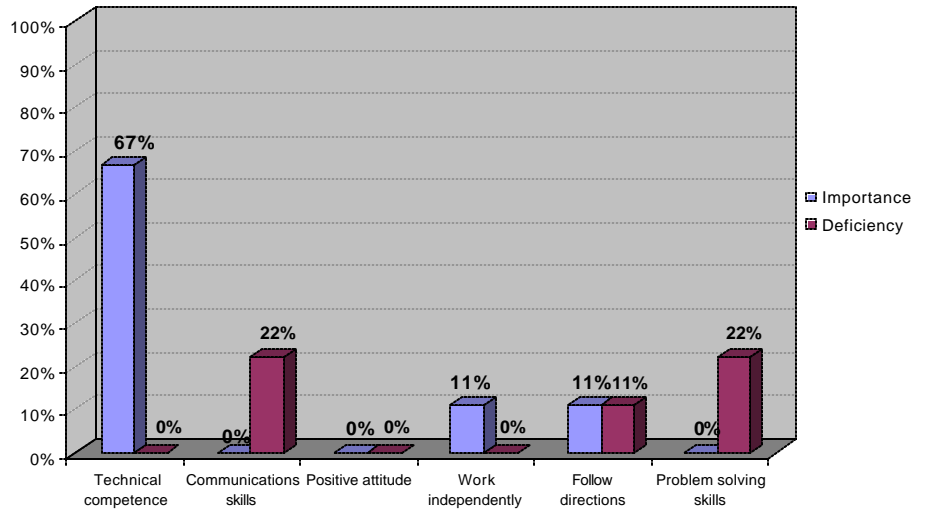


Figure 12. Sales Representatives: Skill Importance and Deficiency

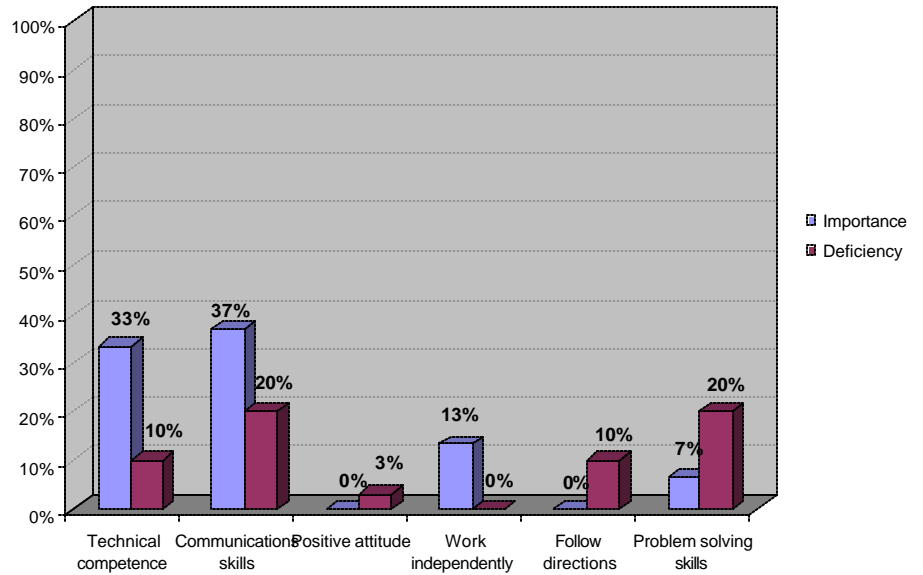


Figure 13. Chemists: Skill Importance and Deficiency

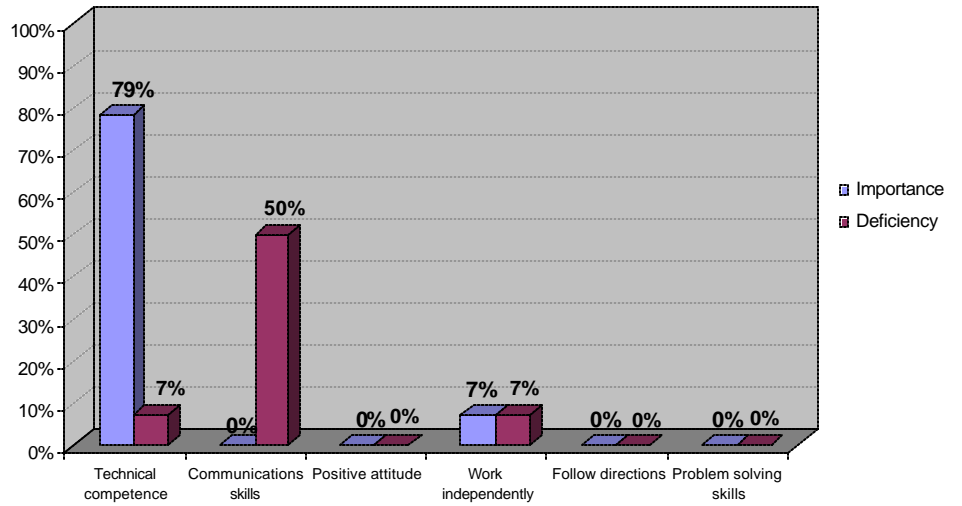


Figure 14. Chemical Technicians: Skill Importance and Deficiency

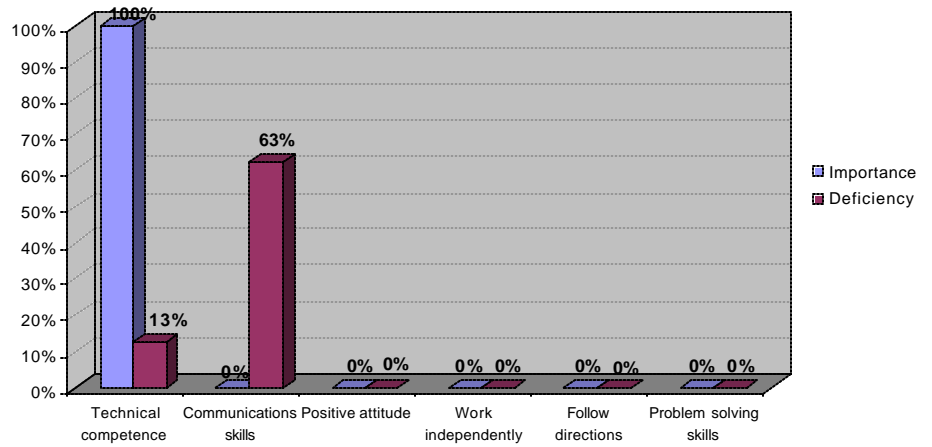


Figure 15. Product Inspectors, Testers, Graders: Skill Importance and Deficiency

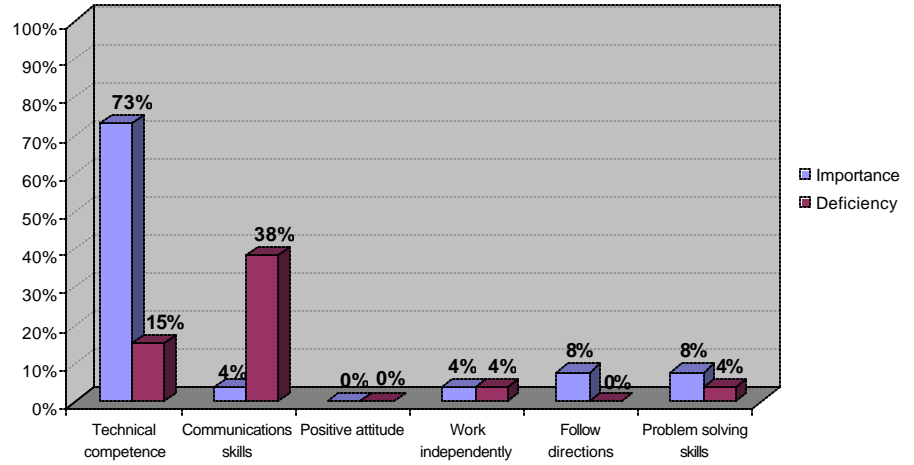


Figure 16. Biological Scientists: Skill Importance and Deficiency

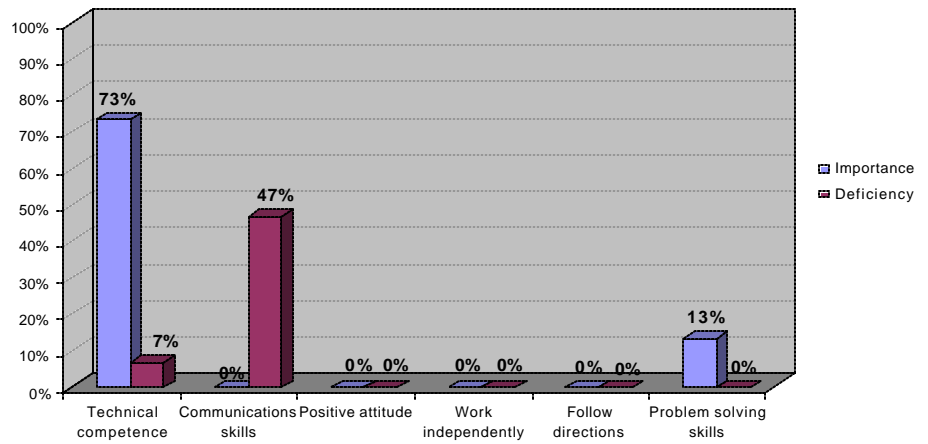


Figure 17. Physical Scientists: Skill Importance and Deficiency

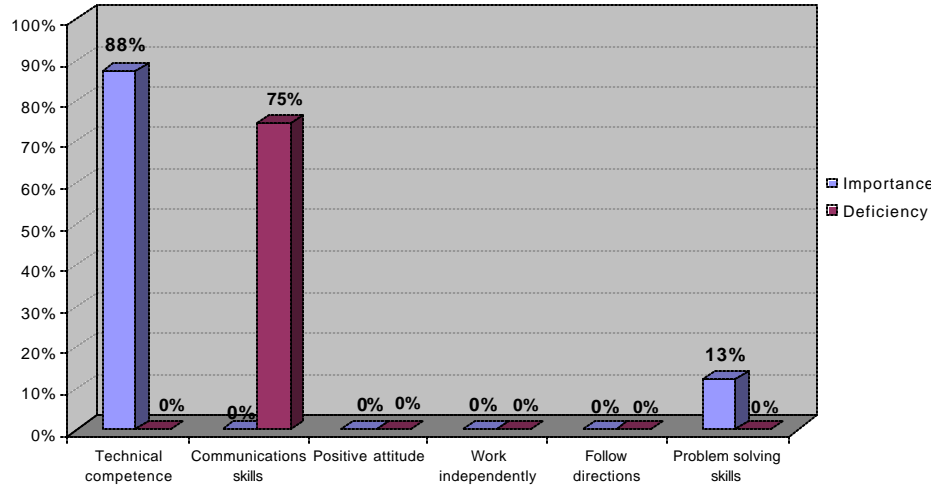


Figure 18. Medical, Clinical Lab Technologists: Skill Importance and Deficiency

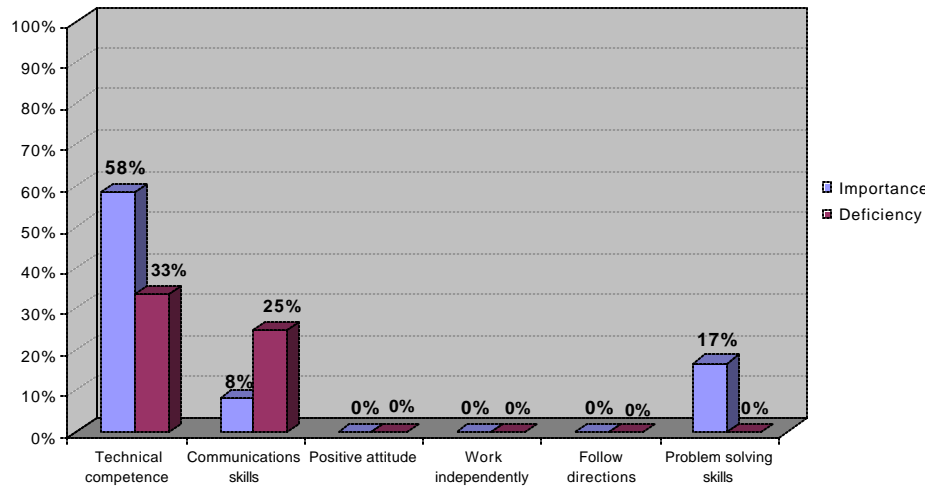
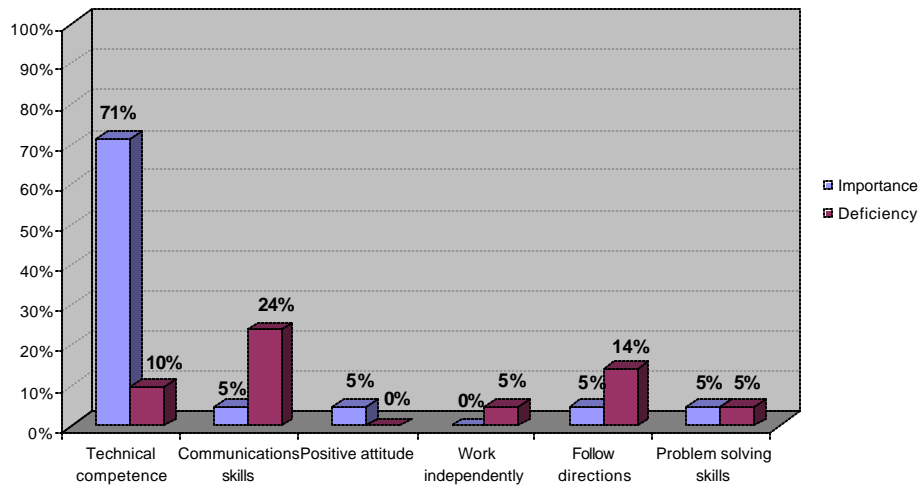


Figure 19. Quality Assurance Auditors: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, ten to 35 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For BIOM, Optical Goods Workers, Chemists, Chemical Technicians, Biological Scientists, and Physical Scientists received less than ten responses for either entry-level or experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Physical Scientists had the highest median^v and mean^{vi} entry-level annual wage (\$67,500 and \$68,750, respectively) as well as the highest median and mean experienced annual wage (\$72,500 and \$70,000, respectively) of the BIOM occupations examined. Physical Scientists, Biological Scientists, and Chemists, were the only occupations in BIOM to receive more than \$50,000 as the experienced median wage.

Table 5. Biomedical Industry Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Assemblers / Fabricators	Entry-Level	\$17,680	\$18,322	\$14,560	\$24,960
	Experienced	\$22,880	\$23,736	\$16,640	\$37,440
Optical Goods Workers	Entry-Level	\$26,000	\$26,523	\$24,000	\$29,120
	Experienced	\$30,160	\$30,594	\$26,500	\$37,440
Sales Representatives	Entry-Level	\$35,250	\$37,686	\$22,880	\$60,000
	Experienced	\$45,000	\$43,320	\$31,200	\$60,000
Chemists	Entry-Level	\$45,000	\$45,611	\$25,000	\$60,000
	Experienced	\$51,000	\$48,533	\$29,000	\$70,000
Chemical Technicians	Entry-Level	\$31,200	\$32,754	\$22,880	\$50,000
	Experienced	\$32,240	\$38,384	\$22,880	\$72,800
Product Inspectors, Testers, Graders	Entry-Level	\$29,120	\$29,847	\$15,080	\$50,000
	Experienced	\$32,240	\$35,553	\$18,720	\$72,800
Biological Scientists	Entry-Level	\$58,000	\$62,224	\$24,960	\$100,000
	Experienced	\$60,500	\$64,475	\$29,120	\$100,000
Physical Scientists	Entry-Level	\$67,500	\$68,750	\$50,000	\$80,000
	Experienced	\$72,500	\$70,000	\$50,000	\$100,000
Medical, Clinical Lab Technologists	Entry-Level	\$32,100	\$37,368	\$24,960	\$50,000
	Experienced	\$39,520	\$38,987	\$30,000	\$72,800
Quality Assurance Auditors	Entry-Level	\$33,280	\$34,062	\$20,800	\$60,000
	Experienced	\$35,000	\$37,436	\$20,800	\$70,000

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Physical Scientists, Biological Scientists, and Chemists the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For all other BIOM occupations the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^vThe median wage represents the mid point in the range of responses if data points are put in sequential order. For Chemists the entry-level median wage of \$45,000 means that half of the *entry-level* wages given for Chemists lie above \$45,000 and the other half of Chemists *entry-level* wages lie below \$45,000.

^{vi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Communications Industry

The Communications Industry (COMM) cluster is primarily made up of firms that research and manufacture communications related products. The cluster also includes firms that provide point-to-point communications services such as cellular phones and beepers.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 97 percent of COMM employees worked full-time, three percent worked part-time, and six percent were temporary employees (see Table 6). The current workforce of almost 23,000 employees is expected to increase by 13 percent in the next 12 months^{vii}. The expected increase in industry employment represents almost 3,000 new jobs for Orange County.

Table 6. Industry Employment Practices^{viii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
COMM	22,860	22,133 97%	727 3%	1,381 6%	2,926 13%

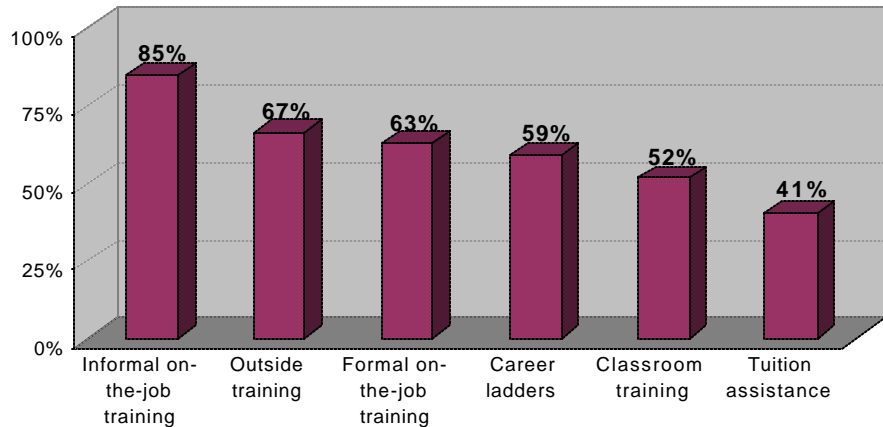
^{vii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{viii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 85 percent of COMM firms reported that they typically utilized informal on-the-job training at their business location, 67 percent offered employer-paid outside training, 63 percent used formal on-the-job training, 59 percent used career development or career ladders, 52 percent utilized in-house classroom training, and 41 percent of COMM firms offered employees tuition assistance at a college or university (see Figure20).

Figure 20. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 22 percent of Communication firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table7). In the last 12 months, approximately one in every 178 employees within the Communication industry in Orange County was hired using an H-1B Visa (see Table8).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 7. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
87	392	22.22%

Table 8. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
127	22,860	0.56%

Communications Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For the Communications Industry, the survey examined nine occupations: Production Inspectors Testers and Graders, Electrical and Electronic Equipment Assemblers, Electrical and Electronic Engineering Technicians, Telephone and Cable Installers and Repairers, Service Representatives, Field Engineers, Digital and Hardware Engineers, Software Engineers, and Communications Systems Engineers. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the nine occupations included in the COMM survey. Respondents were then asked detailed, occupation-specific questions for as many as six occupations that were randomly selected among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Service Representatives are expected to have the highest percentage turnover of the COMM occupations examined (15%), whereas Software Engineers (2%), Telephone and Cable Installers (2%), and Electrical and Electronic Technicians (2%) should have the lowest. Product Inspectors, Testers, and Graders have the highest 12-month rate of expected growth among COMM occupations, with 20 percent. Telephone and Cable Installers (-8%) and Software Engineers (-3%) were the only COMM occupations with negative expected growth over the next 12 months. Service Representatives will have the most openings in the next 12 months (309) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 9).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 9. Occupational Retention, Turnover, and Growth for the Next 12 Months^{ix}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Service Representatives	1,417	6.2%	15%	6%	309
Prod. Inspectors, Testers, and Graders	273	1.2%	7%	20%	73
Field Engineers	436	1.9%	8%	8%	73
Electrical and Electronic Assemblers	424	1.9%	5%	10%	64
Digital and Hardware Engineers	291	1.3%	6%	6%	36
Electrical and Electronic Technicians	1,090	4.8%	2%	2%	36
Communications Systems Engineers	454	2%	7%	0%	30
Telephone and Cable Installers	945	4.1%	2%	-8%	0
Software Engineers	2,944	12.9%	2%	-3%	0
Cluster Total	22,860	100%	5%	13%	4,167

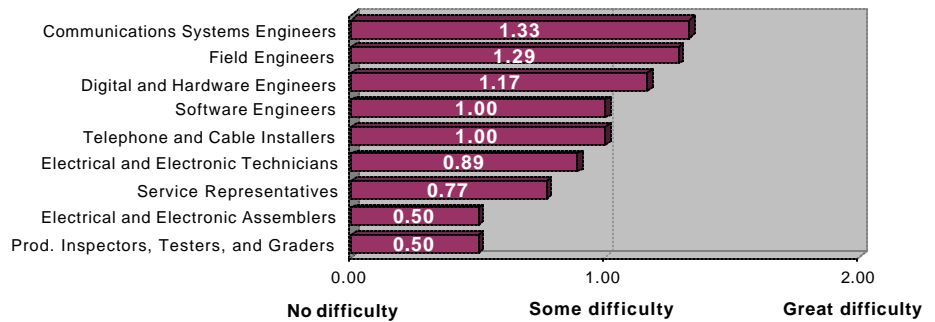
The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had ‘great difficulty’, ‘some difficulty’, or ‘no difficulty’ finding experienced and non-experienced applicants, respectively, for each of the 9 COMM occupations. Responses to these questions were coded according to a difficulty scale where ‘great difficulty’ = +2, ‘some difficulty’ = +1, and ‘no difficulty’ = 0. A score of 1.00 would indicate that, on average, firms had ‘some difficulty’ finding experienced applicants. COMM firms had the most difficulty locating experienced Communication Systems Engineers (1.33), Field Engineers (1.29), Digital and Hardware Engineers (1.17), Software Engineers (1.00), and Telephone and Cable Installers (1.00). Electrical and Electronic Technicians (0.89), Service Representatives (0.77), Electrical and Electronic Assemblers (0.50), and Prod. Inspectors, Testers, and Graders (0.50).

Figure 21. Difficulty Finding Experienced Applicants



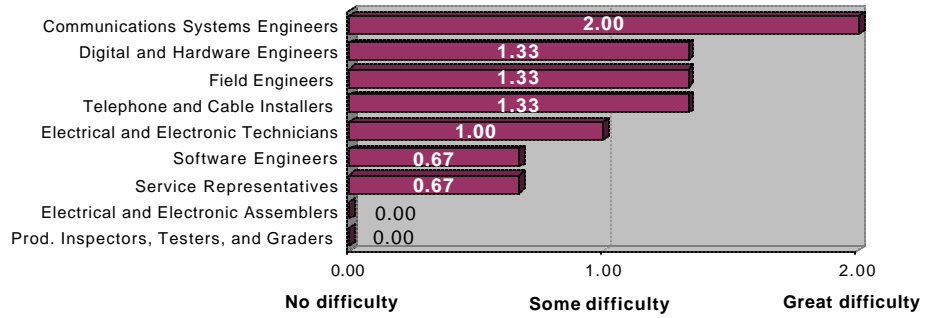
Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Communication System Engineers (2.00), Digital Engineers (1.33), Field Engineers (1.33) and Telephone and Cable

^{ix}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Installers (1.33), whereas firms did not have any difficulty finding non-experienced Electrical and Electronic Assemblers (0.00) and Production Inspectors, Testers, and Graders (0.00).

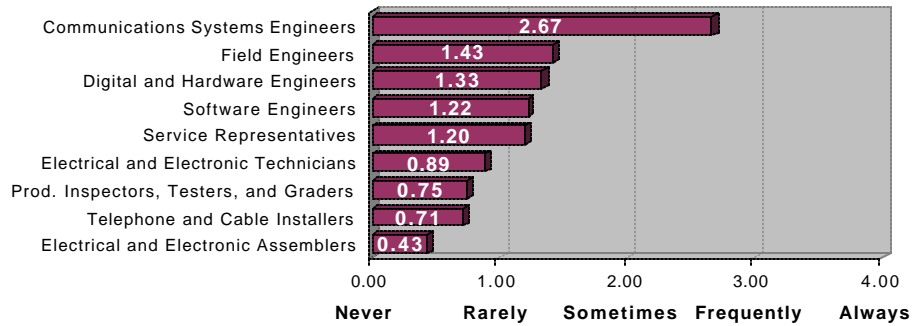
Figure 22. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Communication Systems Engineers (2.67) was the occupation most often recruited from outside the County, followed by Field Engineers (1.43), Digital and Hardware Engineers (1.33), and Software Engineers (1.22). It should be noted that for 4 of the 9 COMM occupations, firms ‘rarely’ to ‘never’ recruited outside the County.

Figure 23. Recruitment Outside of Orange County

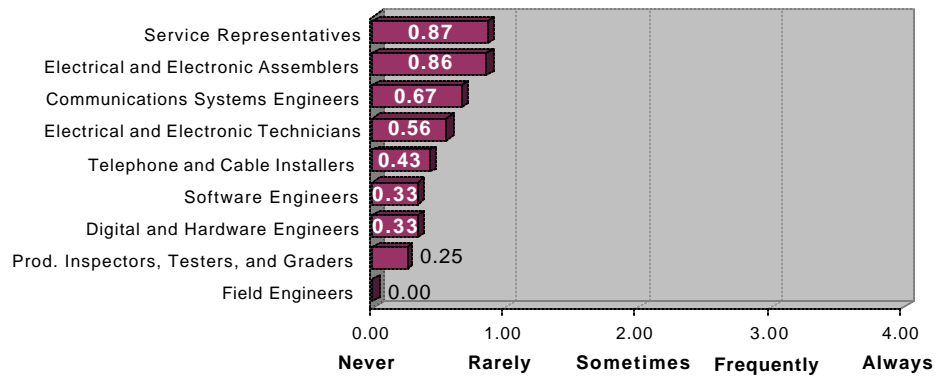


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Service Representatives in part-time positions with greater frequency than they did any other COMM occupation, but even so, their frequency of hiring part-time Service Representatives still only averaged between 'rarely' and 'never' (0.87). For all nine of the COMM occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure 24).

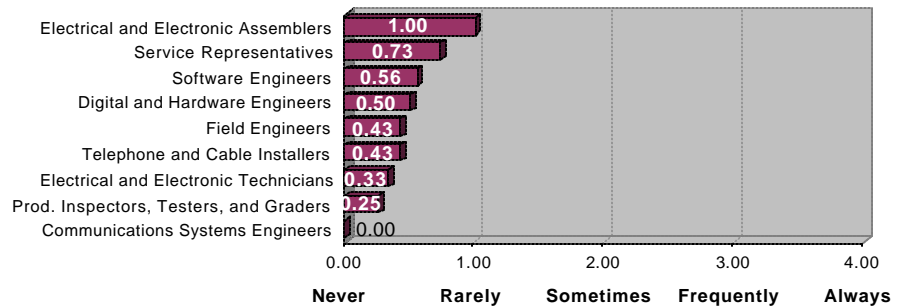
Figure 24. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Electrical and Electronic Assemblers (1.00) was the occupation where temporary employees were most frequently hired. It should be noted that the frequency of hiring temporary workers for each of the 9 COMM occupations examined, ranged between 'never' and 'rarely', with firms hiring temporary Communication Systems Engineers (0.00) with the lowest frequency (see Figure 25).

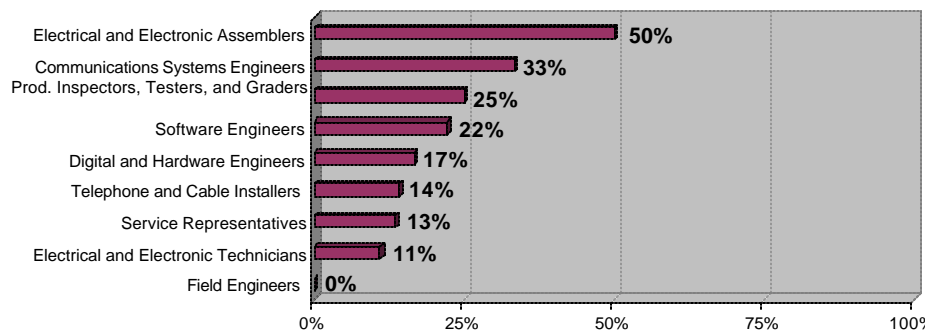
Figure 25. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the 9 COMM occupations. Fifty percent of firms hired non-English speaking Electrical and Electronic Assemblers, followed by Communication Systems Engineers (33%), and Production Inspectors, Testers, and Graders (25%). On the other end of the spectrum, none of the firms hired non-English speaking Field Engineers.

Figure 26. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Communications Industry survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

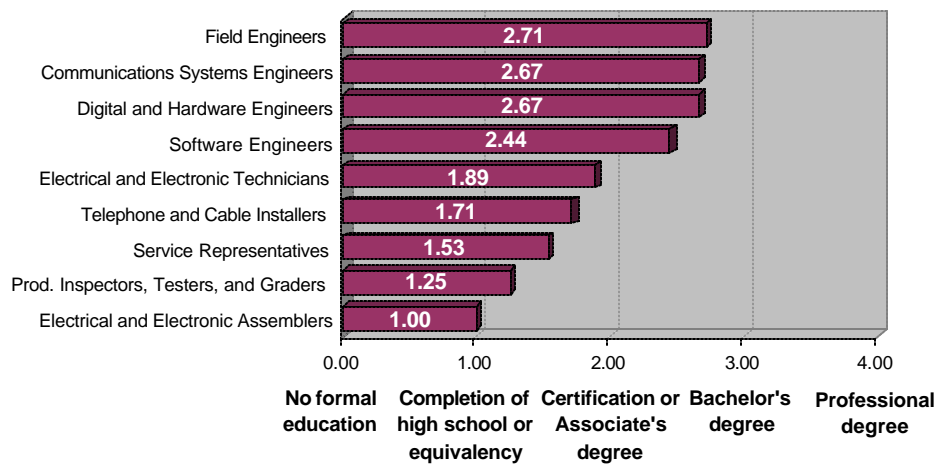
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the 9 COMM occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Field Engineers had the highest average education requirement (2.71), with most respondents agreeing the position required a Bachelor’s degree. Electrical and Electronic Assemblers had the lowest average educational requirements (1.00), with respondents indicating that applicants needed, on average, the completion of high school or its equivalent to be successful. For four of the nine positions examined, respondents indicated that at least a Certificate or Associate’s degree was the required for successful applicants (see Figure27).

Figure 27. Mean Education Requirements by Occupation

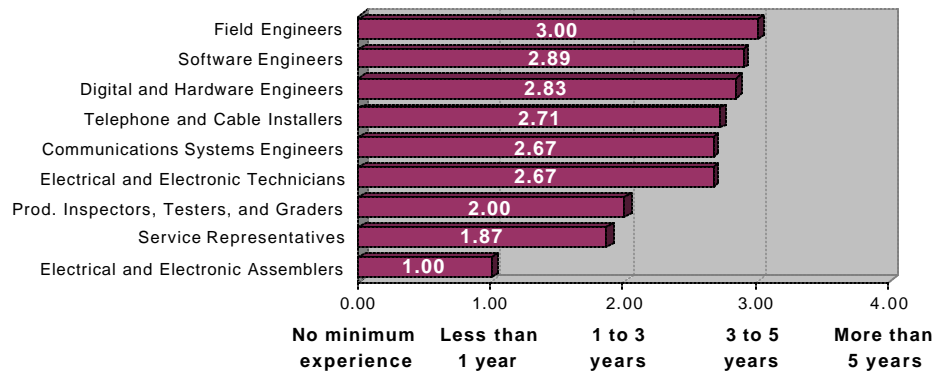


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to Question 19 were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Field Engineers had the highest average experience requirement (3.00) of the 9 occupations examined, followed by Software Engineers (2.89), Digital Hardware Engineers (2.83), and Telephone and Cable Installers(2.71). On the opposite end of the spectrum, Electrical and Electronic Assemblers had the lowest average experience requirements (1.00) for applicants’ success (see Figure28).

Figure 28. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each COMM occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

Forty-seven percent of COMM firms felt communication skills was the most important skill for Service Representative and only 20 percent of COMM firms felt that their Service Representatives were currently deficient in this skill. 'Technical competence specific to the position' was mentioned most(47%) as the skill that Service Representatives were currently most deficient in. For Field Engineers, 86 percent of COMM firms felt that technical competence specific to that position was the most important general skill. COMM firms found Field Engineers most deficient in communication skills (43%) and technical skills specific to the position (43%). Figures 29 through 37 display skill importance and deficiency by each COMM occupation.

Figure 29. Production Inspectors, Testers, and Graders - Skill Importance and Deficiency

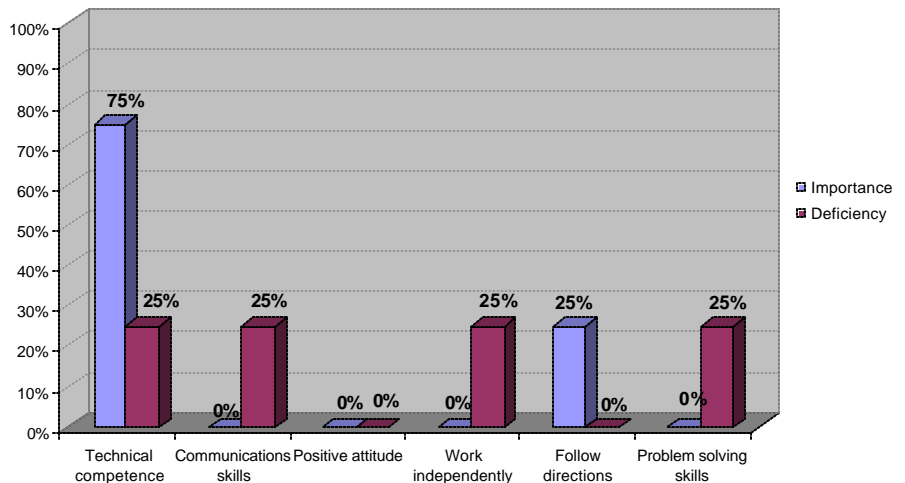


Figure 30. Electrical and Electronic Equipment Assemblers: Skill Importance and Deficiency

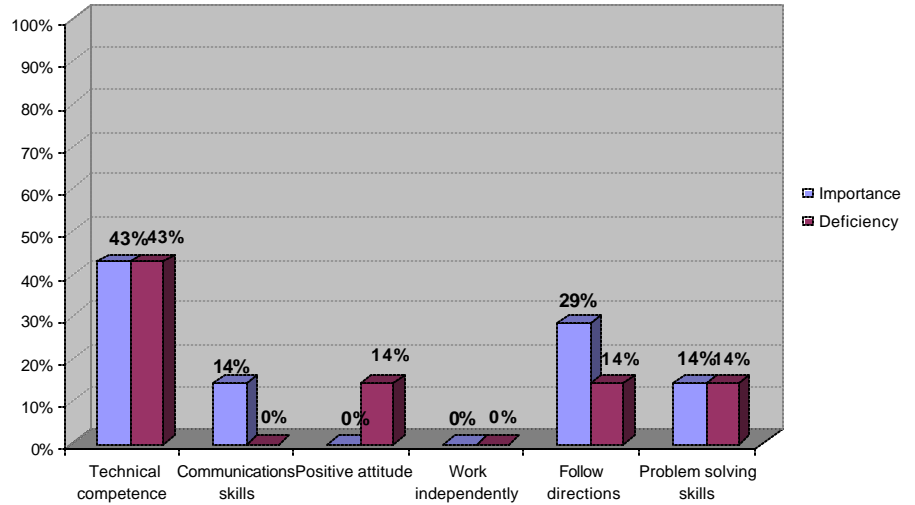


Figure 31. Electrical and Electronic Technicians: Skill Importance and Deficiency

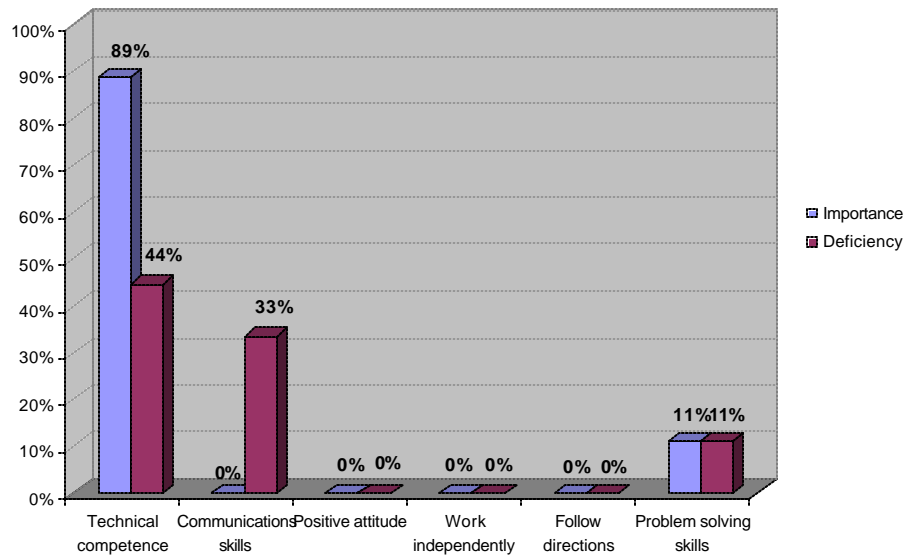


Figure 32. Telephone and Cable Installers: Skill Importance and Deficiency

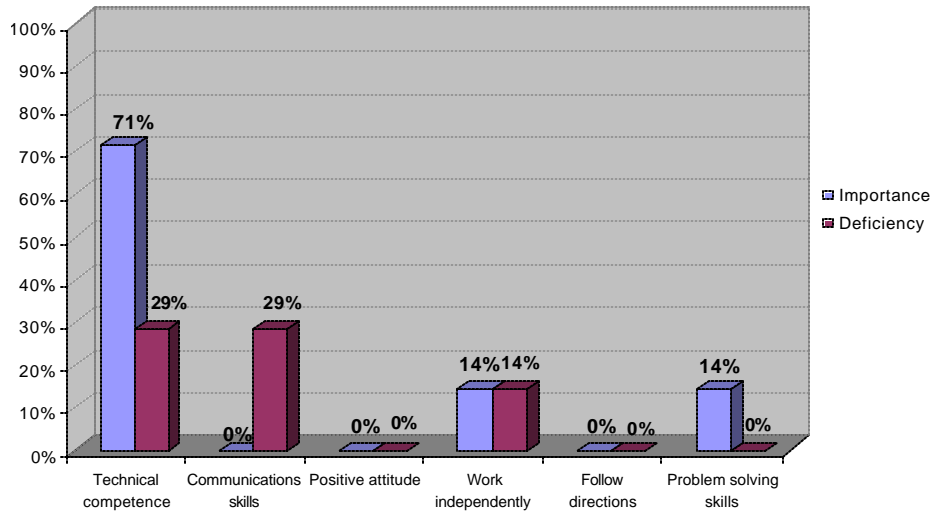


Figure 33. Service Representatives: Skill Importance and Deficiency

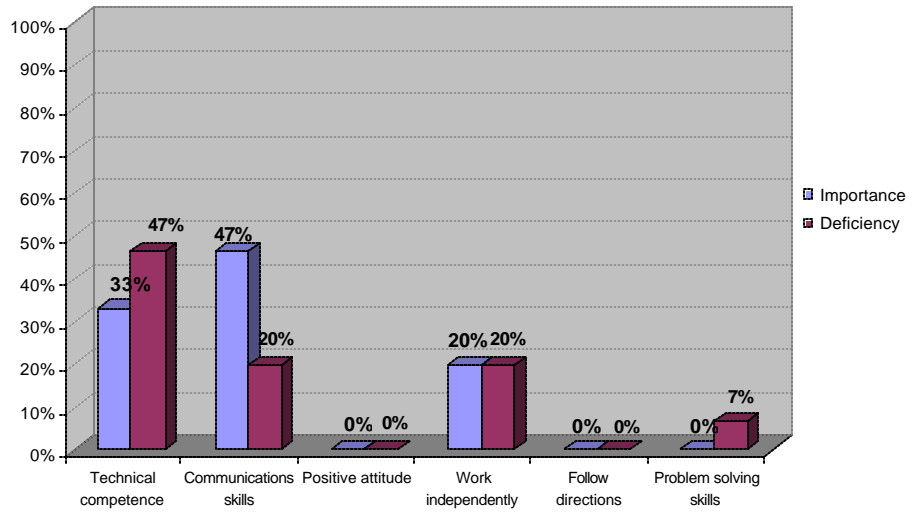


Figure 34. Field Engineers: Skill Importance and Deficiency

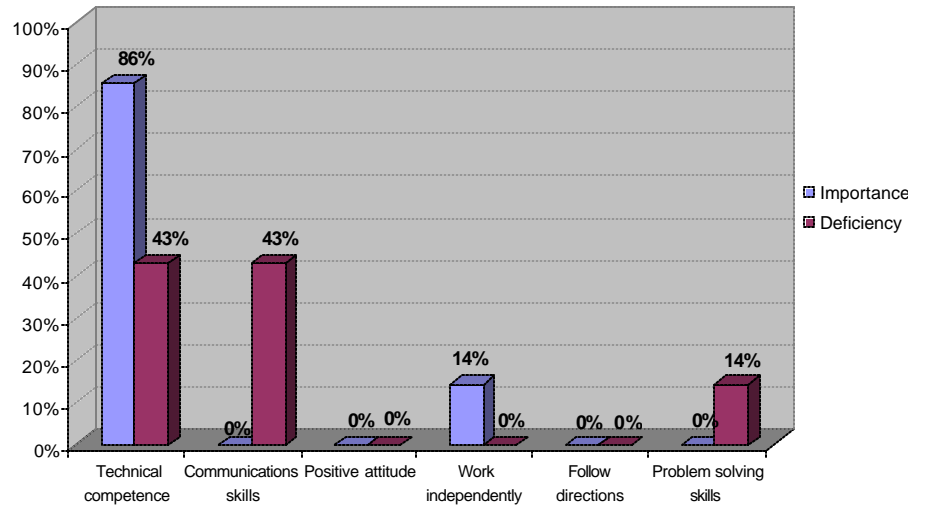


Figure 35. Digital and Hardware Engineers: Skill Importance and Deficiency

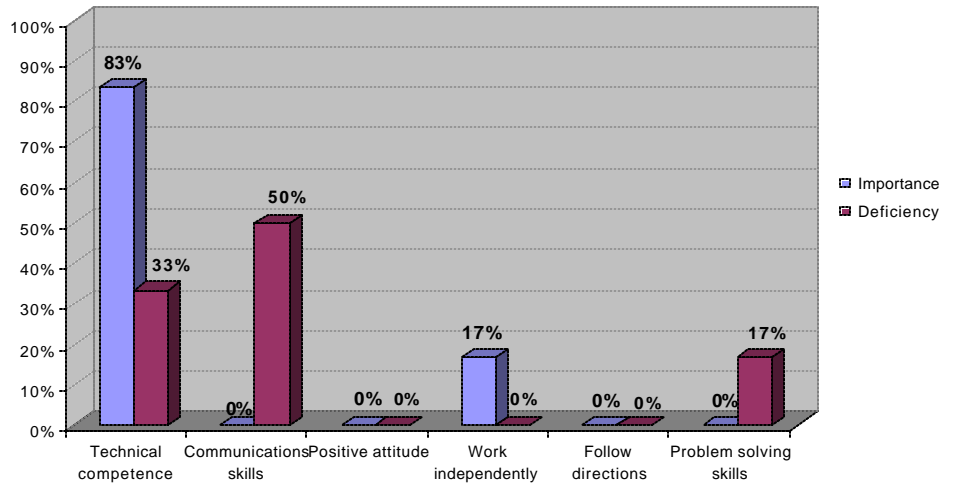


Figure 36. Software Engineers: Skill Importance and Deficiency

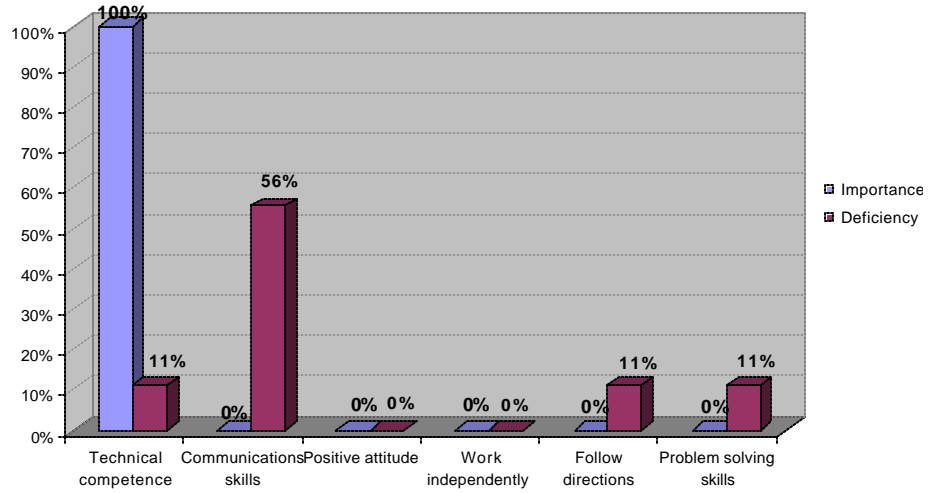
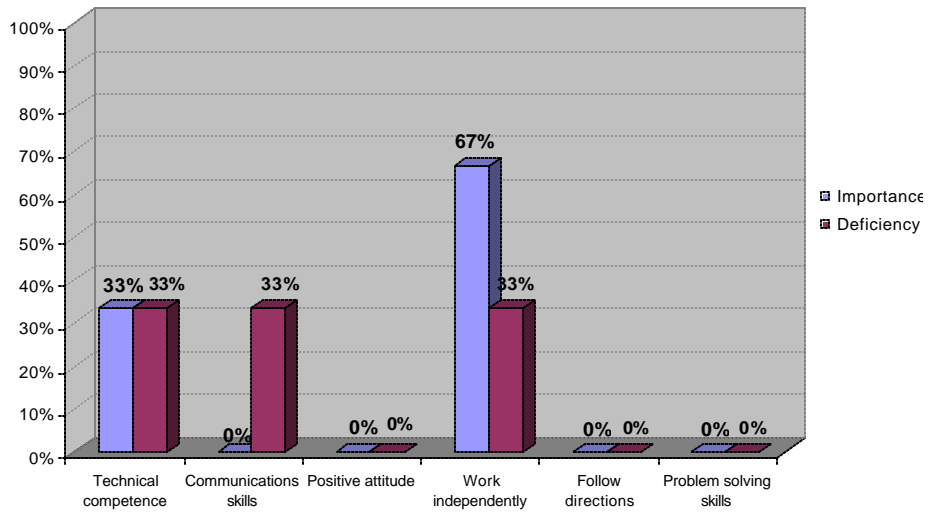


Figure 37. Communications Systems Engineers: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, 15 to 40 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For COMM, every occupation except for Service Representatives received less than ten responses for either entry-level or experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Field Engineers had the highest entry-level annual median^x wage (\$50,000) and Digital and Hardware Engineers had the highest entry-level annual mean^{xi} wage (\$50,800) of the COMM occupations examined. Field Engineers, Software Engineers, and Digital Hardware Engineers, were the only occupations in COMM to receive more than \$50,000 as the experienced median wage.

Table 10. Communication Industry Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Production Inspectors, Testers, and Graders	Entry-Level	\$22,900	\$22,120	\$17,680	\$25,000
	Experienced	\$32,100	\$32,100	\$31,200	\$33,000
Electrical and Electronic Equipment Assemblers	Entry-Level	\$22,000	\$22,411	\$14,560	\$36,000
	Experienced	\$27,500	\$28,076	\$20,800	\$38,000
Electrical and Electronic Engineering Technicians	Entry-Level	\$28,000	\$35,475	\$22,880	\$60,000
	Experienced	\$40,000	\$45,617	\$29,120	\$65,000
Telephone and Cable Installers and Repairers	Entry-Level	\$24,960	\$32,384	\$24,000	\$50,000
	Experienced	\$45,500	\$45,550	\$31,200	\$60,000
Service Representatives	Entry-Level	\$19,000	\$27,351	\$15,600	\$70,000
	Experienced	\$24,770	\$34,305	\$18,720	\$80,000
Field Engineers	Entry-Level	\$50,000	\$46,354	\$30,000	\$70,000
	Experienced	\$58,000	\$56,256	\$33,280	\$75,000
Digital and Hardware Engineers	Entry-Level	\$48,500	\$50,800	\$31,200	\$80,000
	Experienced	\$55,000	\$56,872	\$35,360	\$85,000
Software Engineers	Entry-Level	\$45,000	\$45,618	\$31,200	\$70,000
	Experienced	\$52,000	\$50,473	\$31,200	\$75,000
Communications Systems Engineers	Entry-Level	\$24,960	\$24,960	\$22,880	\$27,040
	Experienced	\$29,640	\$29,640	\$28,080	\$31,200

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Service Representatives, Field Engineers, Digital and Hardware Engineers, Software Engineers, and Communications Systems Engineers, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For all other COMM occupations, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^xThe median wage represents the mid point in the range of responses if data points are put in sequential order. For Field Engineers the entry-level median wage of \$50,000 means that half of the *entry-level* wages given for Field Engineers lie above \$50,000 and the other half of Field Engineers *entry-level* wages lie below \$50,000.

^{xi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Computer Hardware and Electronics

The Computer Hardware and Electronics (CHE) cluster is made up of firms that manufacture and assemble electronic components and computer products. The cluster emphasizes high technology and computer-related products and their input components.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 97 percent of CHE employees worked full-time, three percent worked part-time, and two percent of the cluster workforce was temporary employees (see Table 11). The current workforce of almost 45,000 employees is expected to decrease by 2 percent in the next 12 months^{xii}. The expected decline in industry employment represents a loss of 800 jobs for Orange County.

Table 11. Industry Employment Practices^{xiii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
CHE	44,954	43,424 97%	1,530 3%	1,089 2%	-809 -2%

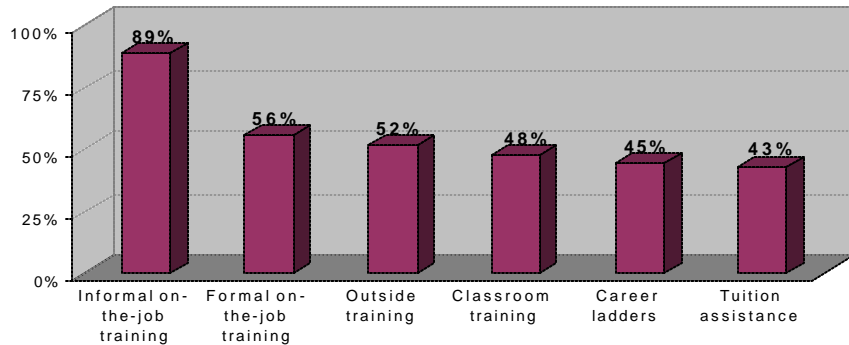
^{xii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xiii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 89 percent of CHE firms reported that they typically utilized informal on-the-job training at their business location, 56 percent used formal on-the-job training, 52 percent offered employer-paid outside training, 48 percent utilized in-house classroom training, 45 percent used career development or career ladders, and 43 percent of CHE firms offered employees tuition assistance at a college or university (see Figure38).

Figure 38. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 28 percent of CHE firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table12). In the last 12 months, approximately one in every 77 employees within the CHE industry was hired using an H-1B Visa (see Table18).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 12. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
295	1,072	27.55%

Table 13. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
585	44,954	1.30%

Computer Hardware and Electronics Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For the Computer Hardware and Electronics Industry, the survey examined eight occupations: Electrical Engineers, Electrical Technologists, Electrical Technicians, Electrical Assemblers, Sales Engineers, Sales Representatives, ASIC Engineers, and Facility or Quality Control Manager. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the 8 occupations included in the CHE survey. Respondents were then asked detailed, occupation-specific questions for as many as six occupations that were randomly selected among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Facility or Quality Control Managers and Sales Engineers are expected to have the highest percentage turnover of the occupations examined (16% and 14%, respectively), whereas Electrical Engineers (5%) and Electrical Assemblers (7%) expect to have the lowest. Electrical Technicians and Electrical Technologists had the highest 12-month rate of expected growth among CHE occupations, with 16 percent. ASIC Engineers (-11%), Sales Engineers (-4%), and Facility of Quality Control Manager (-3%) were the only CHE occupations examined with negative expected growth over the next 12 months. Electrical Assemblers will have the most openings in the next 12 months (505) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 14).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 14. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xiv}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Electrical Assemblers	2,779	6.2%	7%	11%	505
Electrical Engineers	1,499	3.3%	5%	7%	189
Sales Representatives	1,650	3.7%	9%	1%	172
Electrical Technicians	538	1.2%	8%	16%	132
Electrical Technologists	376	0.8%	13%	16%	109
Sales Engineers	780	1.7%	14%	-4%	75
Facility or Quality Control Manager	564	1.3%	16%	-3%	70
ASIC Engineers	72	0.2%	11%	-11%	0
Cluster Total	44,954	100%	11%	-2%	4,171

^{xiv}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

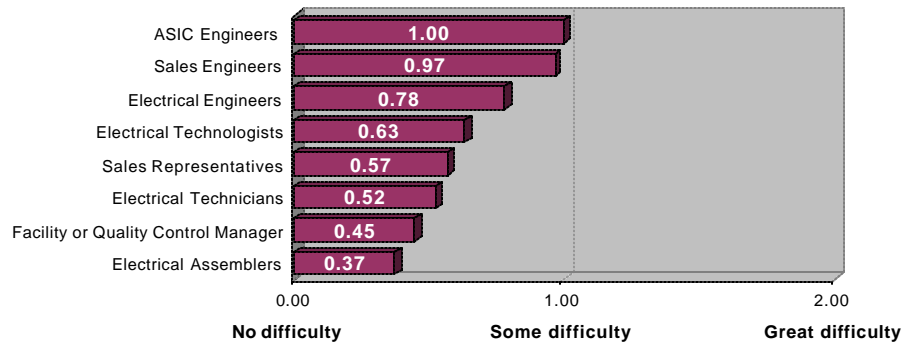
The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 8 CHE occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. CHE firms had the most difficulty locating experienced ASIC Engineers (1.00), Sales Engineers (0.97), Electrical Engineers (0.78), and Electrical Technologists (0.63).

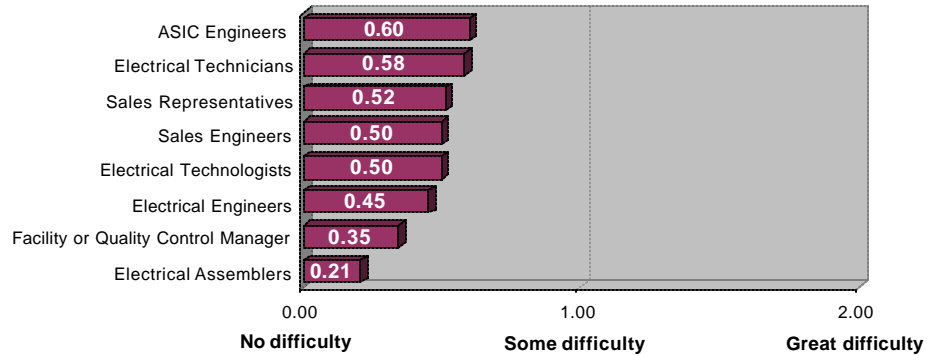
Figure 39. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced ASIC Engineers (0.60), Electrical Technicians (0.58), and Sales Representatives (0.52), whereas CHE firms had little to no difficulty finding non-experienced Electrical Assemblers (0.21).

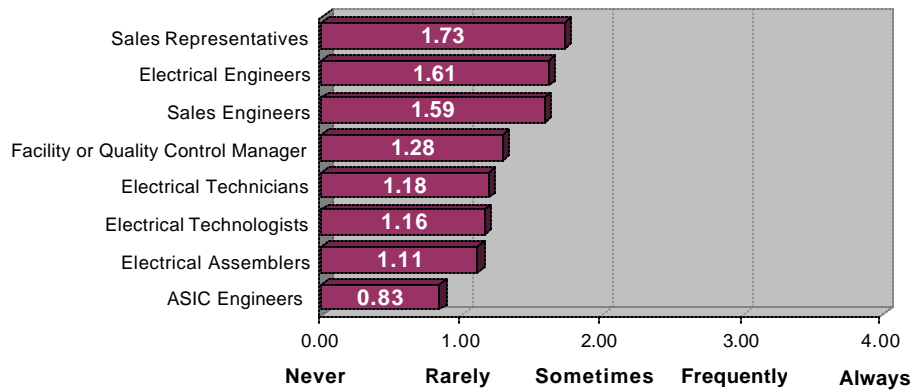
Figure 40. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Sales Representatives (1.73) was the occupation most often recruited from outside the County, followed by Electrical Engineers (1.61), Sales Engineers (1.59), and Facility or Quality Control Manager (1.28). It should be noted that for 7 of the 8 occupations, firms ‘rarely’ to ‘sometimes’ recruited outside the County.

Figure 41. Recruitment Outside of Orange County

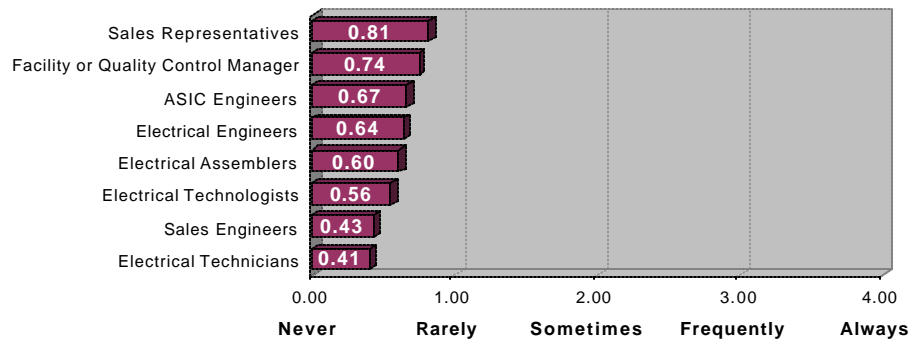


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Sales Representatives in part-time positions with greater frequency than they did any other CHE occupation, but even so, their frequency of hiring part-time Sales Representatives still only averaged between 'rarely' and 'never' (0.81). For all of the eight CHE occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure 42).

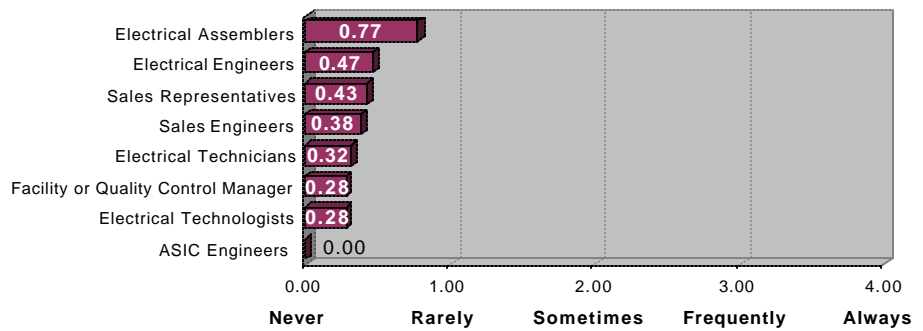
Figure 42. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Electrical Assemblers (0.77) was the occupation where temporary employees were most frequently hired, followed by Electrical Engineers (0.47) and Sales Representatives (0.43). It should be noted that the frequency of hiring temporary workers for each of the 8 CHE occupations ranged between 'never' and 'rarely', with firms hiring temporary ASIC Engineers (0.19) with the lowest frequency (see Figure 43).

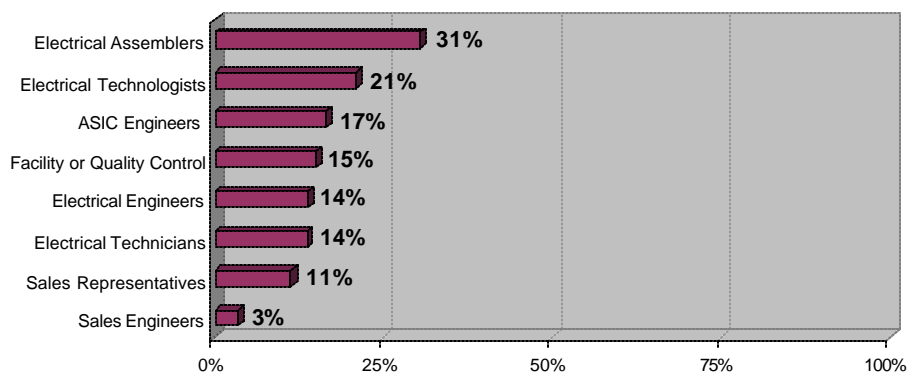
Figure 43. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the eight CHE occupations. Thirty-one percent of firms hired non-English speaking Electrical Assemblers, followed by Electrical Technologists (21%), and ASIC Engineers (17%). On the other end of the spectrum, three percent of the firms hired non-English speaking Sales Engineers.

Figure 44. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Computer Hardware and Electronic survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

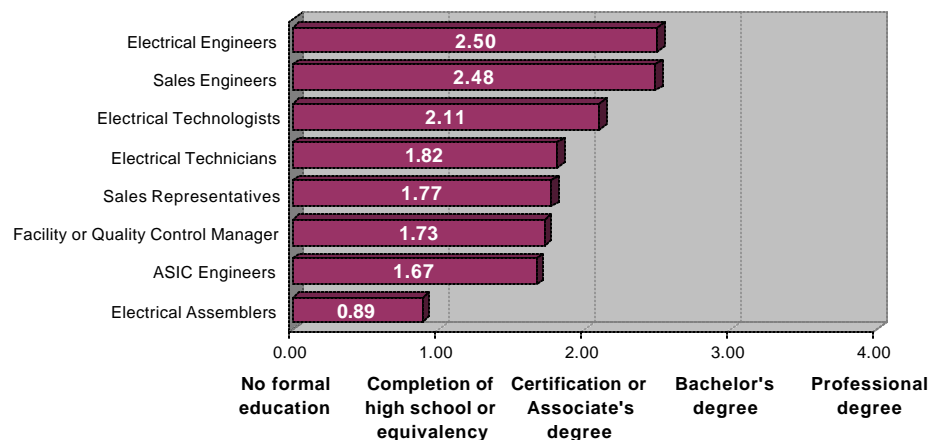
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the eight CHE occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Electrical Engineers had the highest average education requirement (2.50), followed by Sales Engineers (2.48), and Electrical Technologists(2.11). Electrical Assemblers had the lowest average educational requirements (0.89), with respondents indicating that applicants needed, on average, slightly more than completion of high school or its equivalent to be successful. For three of the eight positions examined, respondents indicated that at least a Certificate or Associate’s degree was the expected education level of successful applicants (see Figure45).

Figure 45. Mean Education Requirements by Occupation

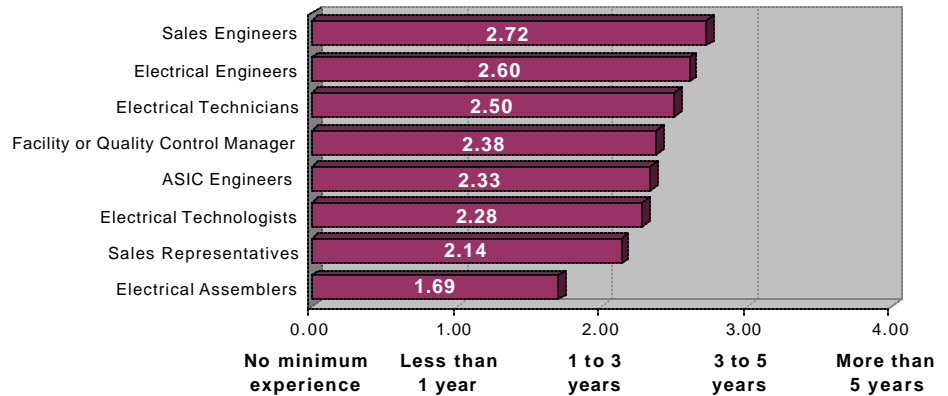


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to the next question were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Sales Engineers had the highest average experience requirement (2.72) of the eight occupations examined, followed by Electrical Engineers (2.60), Electrical Technicians (2.50), and Facility or Quality Control Manager (2.38). On the opposite end of the spectrum, Electrical Assemblers had the lowest average experience requirements (1.69) for applicants’ success (see Figure 46).

Figure 46. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each CHE occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

Forty-two percent of firms felt technical competence specific to the position was the most important skill for Electrical Assemblers and only 19 percent of firms felt that their employees were currently deficient in this skill. For Electrical Engineers, 72 percent of firms felt that technical skills specific to the position was the most important and 36 percent of firms noted that employees were most deficient in technical skills specific to the position. Figures 47 through 54 display skill importance and deficiency by each occupation.

Figure 47. Electrical Engineers - Skill Importance and Deficiency

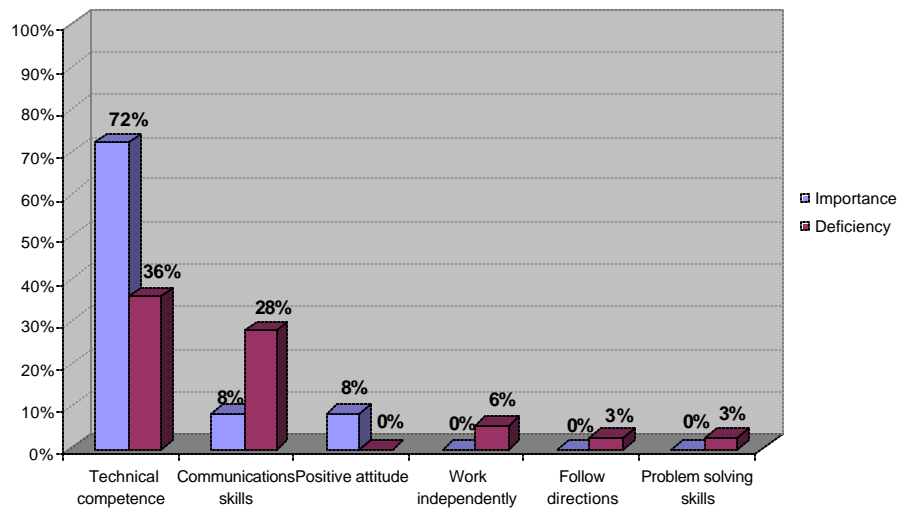


Figure 48. Electrical Technologists: Skill Importance and Deficiency

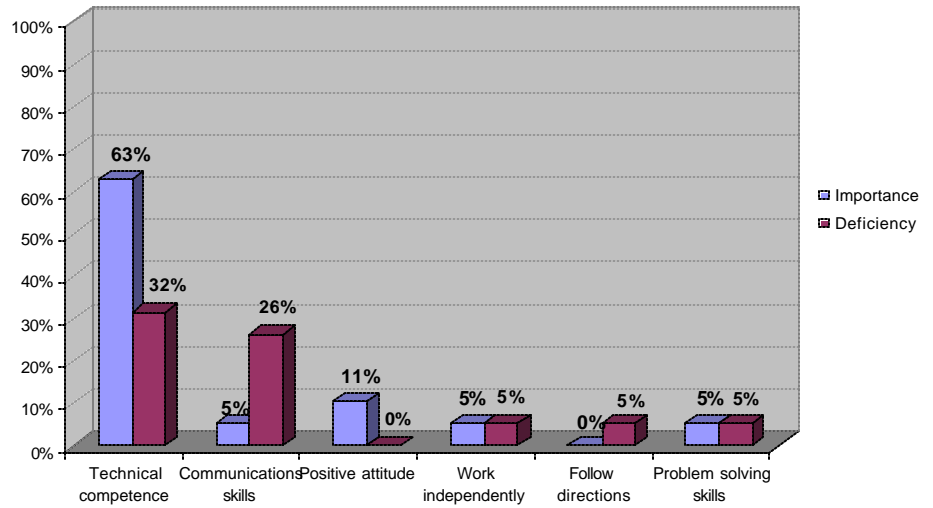


Figure 49. Electrical Technicians: Skill Importance and Deficiency

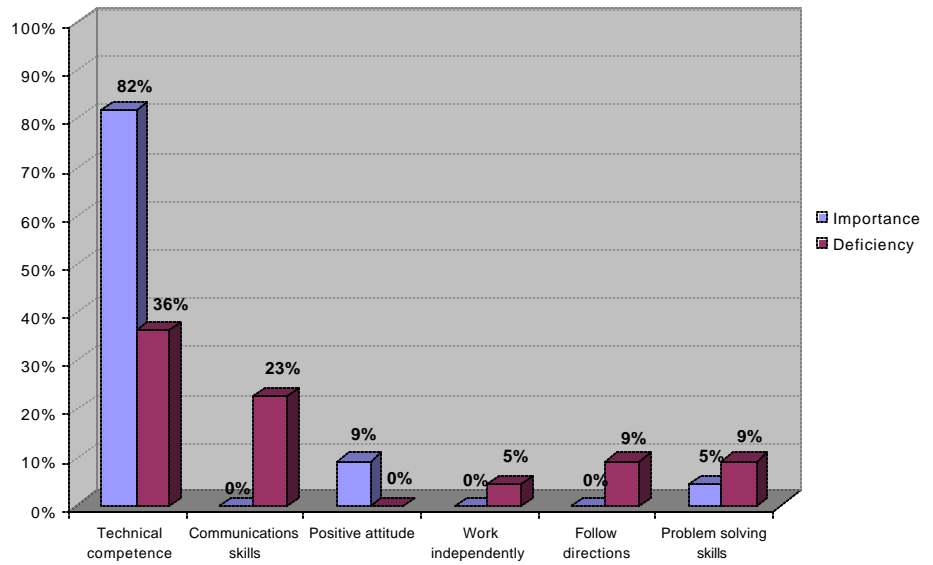


Figure 50. Electrical Assemblers: Skill Importance and Deficiency

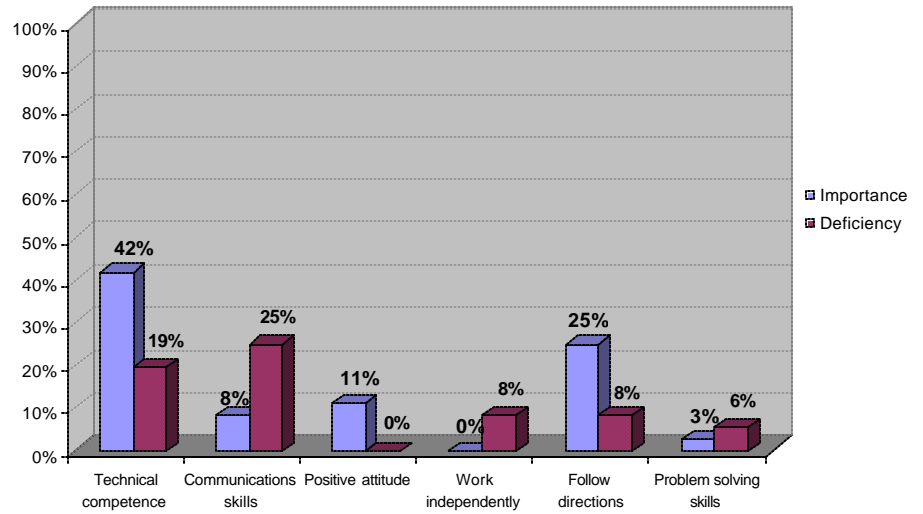


Figure 51. Sales Engineers: Skill Importance and Deficiency

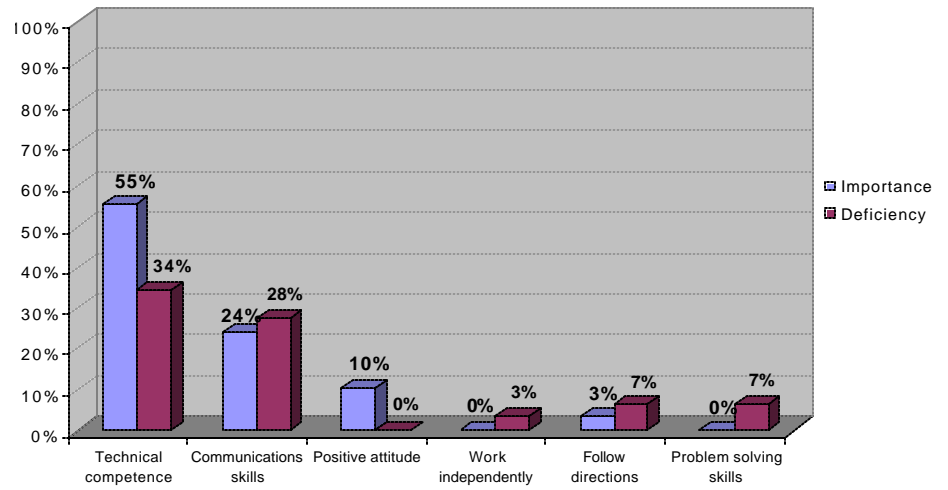


Figure 52. Sales Representatives: Skill Importance and Deficiency

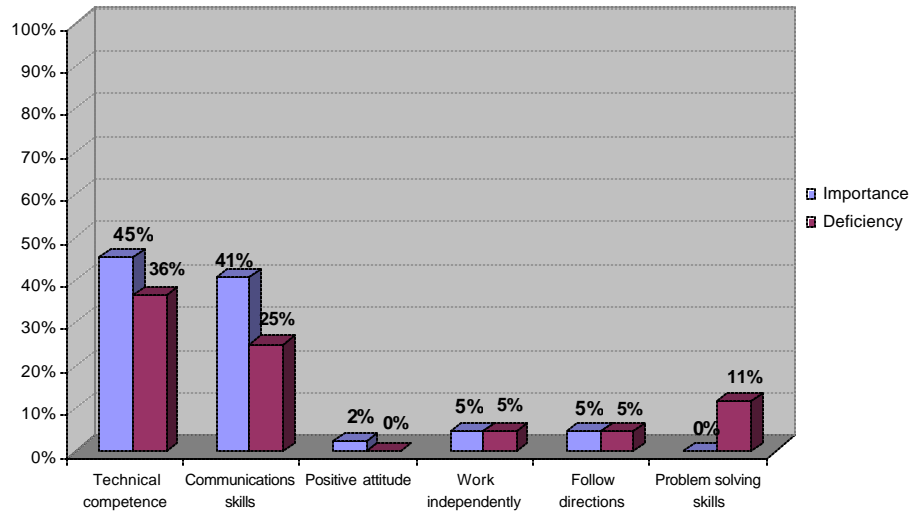


Figure 53. ASIC Engineers: Skill Importance and Deficiency

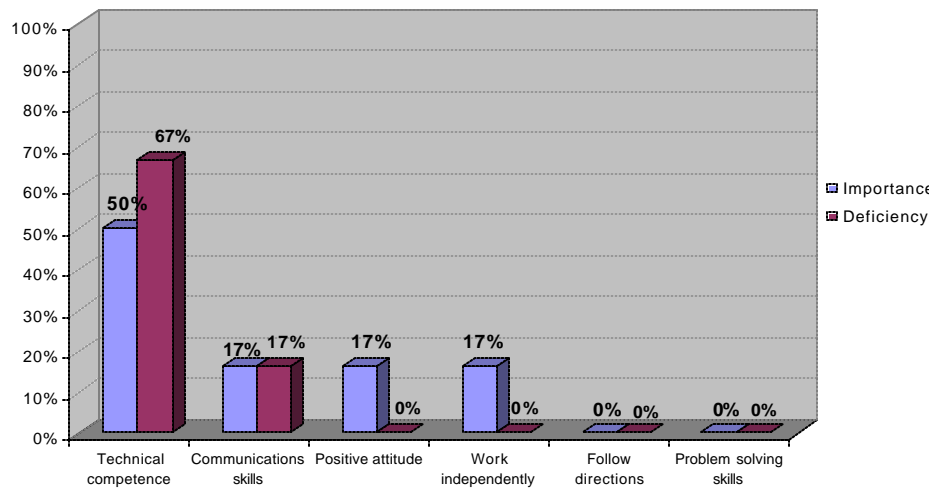
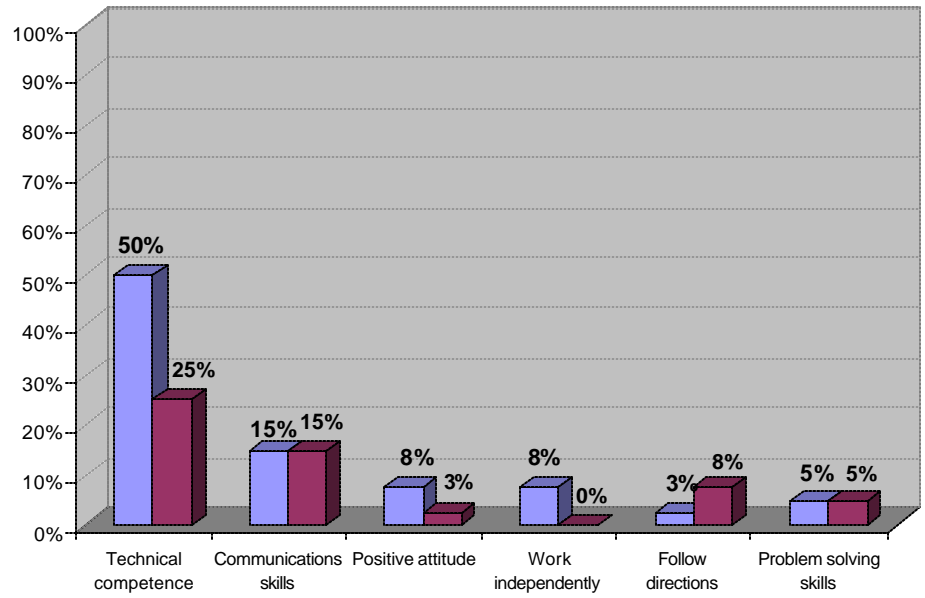


Figure 54. Facility or Quality Control Managers: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, 15 to 40 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For CHE, every occupation except for Service Representatives received less than ten responses for either entry-level or experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Electrical Engineers had the highest median^{xv} wage and mean^{xvi} entry-level annual wage (\$53,000 and \$54,446, respectively) and Sales Engineers has the highest median and mean experienced annual wage (\$72,800 and \$65,931, respectively) of the CHE occupations examined. Electrical Engineers, Electrical Technologists, Sales Engineers, and ASIC Engineers were the only occupations in CHE to receive more than \$50,000 as the experienced median wage.

Table 15. Computer Hardware and Electronics Industry Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Electrical Engineers	Entry-Level	\$53,000	\$54,446	\$25,000	\$80,000
	Experienced	\$57,000	\$57,087	\$28,000	\$100,000
Electrical Technologists	Entry-Level	\$45,000	\$47,615	\$24,960	\$75,000
	Experienced	\$54,500	\$54,266	\$28,000	\$80,000
Electrical Technicians	Entry-Level	\$37,680	\$36,803	\$16,640	\$60,000
	Experienced	\$42,260	\$43,264	\$29,000	\$70,000
Electrical Assemblers	Entry-Level	\$22,000	\$23,636	\$14,040	\$52,000
	Experienced	\$29,560	\$31,398	\$15,600	\$60,320
Sales Engineers	Entry-Level	\$50,000	\$52,817	\$14,040	\$80,000
	Experienced	\$72,800	\$65,931	\$20,800	\$90,000
Sales Representatives	Entry-Level	\$35,000	\$40,258	\$20,800	\$90,000
	Experienced	\$45,000	\$48,740	\$27,000	\$100,000
ASIC Engineers	Entry-Level	\$50,500	\$49,569	\$39,416	\$57,000
	Experienced	\$57,000	\$53,683	\$39,416	\$65,000
Facility or Quality Control Manager	Entry-Level	\$36,220	\$40,322	\$16,640	\$70,000
	Experienced	\$41,600	\$46,536	\$17,680	\$80,000

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Electrical Engineers, Electrical Technologists, Sales Engineers, ASIC Engineers, and Facility or Quality Control Managers the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Electrical Technicians, Electrical Assemblers, and Sales Representatives, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xv}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Sales Engineers the entry-level median wage of \$50,000 means that half of the *entry-level* wages given for Sales Engineers lie above \$50,000 and the other half of Sales Engineers *entry-level* wages lie below \$35,000.

^{xvi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Computer Software

The Computer Software and Services (SOFT) cluster is made up of firms that provide computer and software-related services. The services include computer programming, prepackaged software, and software development.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 94 percent of SOFT employees worked full-time, six percent worked part-time, and three percent were temporary employees (see Table 16). The current workforce of almost 32,000 employees is expected to decrease by one percent in the next 12 months^{xvii}. The expected decrease in industry employment represents a loss of approximately 350 jobs for Orange County.

Table 16. Industry Employment Practices^{xviii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
SOFT	31,937	29,950 94%	1,987 6%	985 3%	-357 -1%

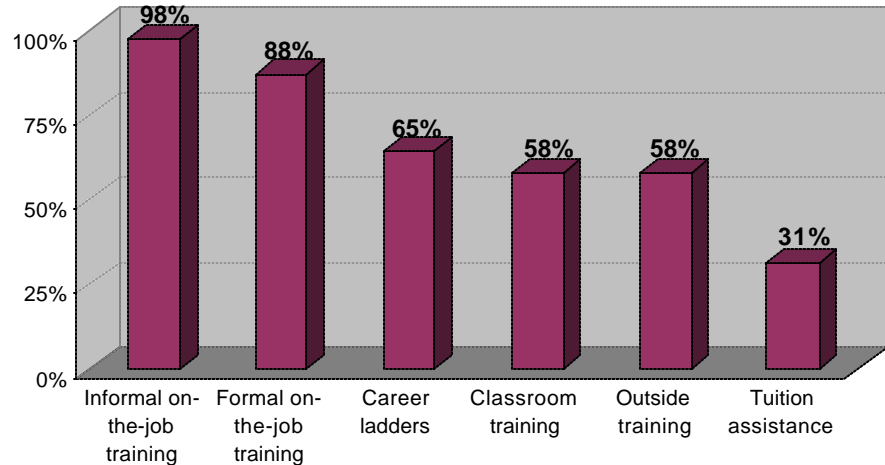
^{xvii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xviii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 98 percent of firms reported that they typically utilized informal on-the-job training at their business location, 88 percent used formal on-the-job training, 65 percent offered career development or career ladders, 58 percent used in-house classroom training, 58 percent utilized employer-paid outside training, and 31 percent offered employees tuition assistance at a college or university (see Figure55).

Figure 55. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 19 percent of Computer Software firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table17). In the last 12 months, approximately one in every 44 employees within Computer Software was hired using an H-1B Visa (see Table18).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 17. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
429	2,286	18.75%

Table 18. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
730	31,937	2.29%

Computer Software Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For Computer Software, the survey examined nine occupations: Software Engineers, Systems Administrators / DB Administrators, Customer Support Specialists, Project Managers, Technical Writers, Sales Representatives, Inspectors, Testers, and Quality Assurance (QA) Auditors, Network Systems Administrators, and Data Entry Keyers. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the nine occupations included in the SOFT survey. Respondents were then asked detailed, occupation-specific questions about six occupations that were randomly selected from among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Data Entry Keyers are expected to have the highest percentage turnover of the occupations examined (24%), whereas Network Systems Administrators (0%) and Technical Writers (3%) should have the lowest. Software Engineers and Project Managers had the highest 12-month rate of expected growth among SOFT occupations, with 16 percent and ten percent, respectively. None of the nine SOFT occupations had negative expected growth over the next 12 months although the cluster, overall, was expected to have a negative growth rate of one percent. Software Engineers will have the most openings in the next 12 months (374) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 19).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Table 19. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xix}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Software Engineers	1,647	5%	6%	16%	374
Sales Representatives	1,875	6%	4%	5%	158
Data Entry Keyers	535	2%	24%	5%	153
Customer Support Specialists	2,219	7%	4%	2%	141
Project Managers	905	3%	4%	10%	124
Systems Administrators / DB Admin	832	3%	6%	6%	102
Inspectors, Testers, and QA Auditors	690	2%	9%	3%	84
Technical Writers	526	2%	3%	0%	17
Network Systems Administrators	747	2%	0%	0%	0
Cluster Total	31,937	100%	11%	-1%	3,181

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

^{xix}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

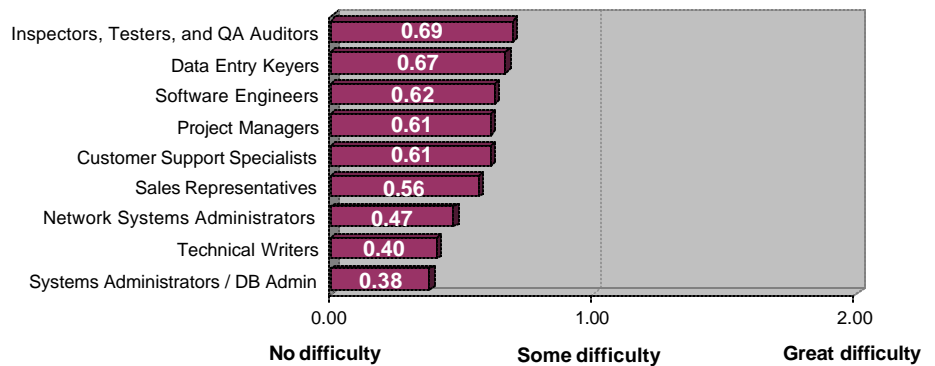
The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the nine SOFT occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. SOFT firms had the most difficulty locating experienced Inspectors, Testers, and QA Auditors (0.69), Data Entry Keyers (0.67), and Software Engineers (0.62).

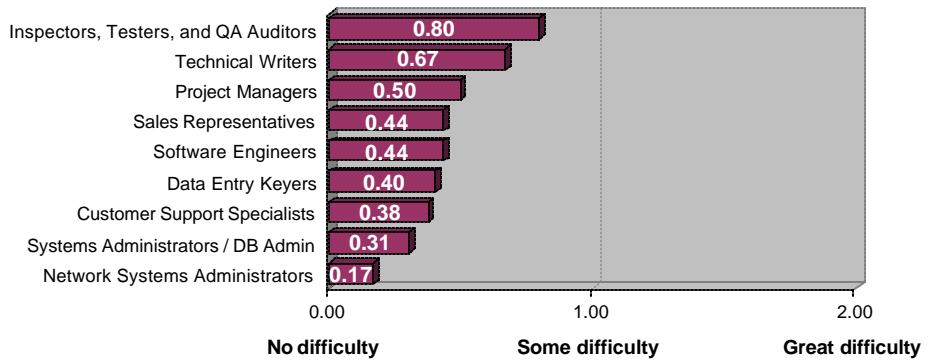
Figure 56. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Inspectors, Testers, and QA Auditors (0.80), Technical Writers (0.67), and Project Managers (0.50), whereas firms did not have much difficulty finding non-experienced Network Systems Administrators (0.17).

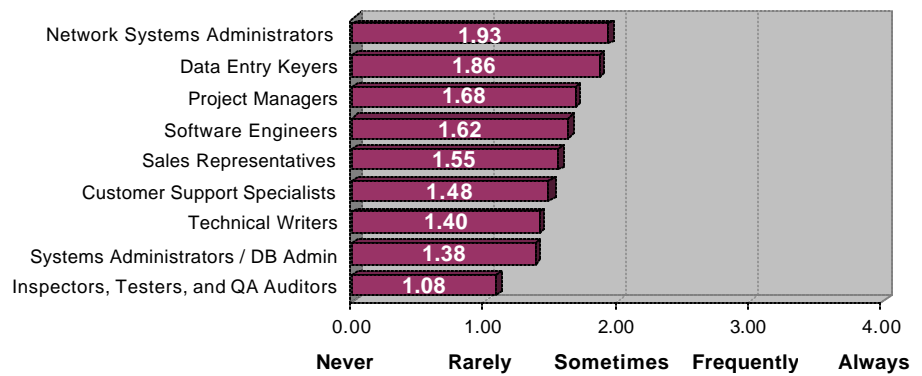
Figure 57. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Network Systems Administrators (1.93) was the occupation most often recruited from outside the County, followed by Data Entry Keyers (1.86), Project Managers (1.68), and Software Engineers (1.62). It should be noted that for all nine occupations, firms ‘rarely’ to ‘sometimes’ recruited outside the County.

Figure 58. Recruitment Outside of Orange County

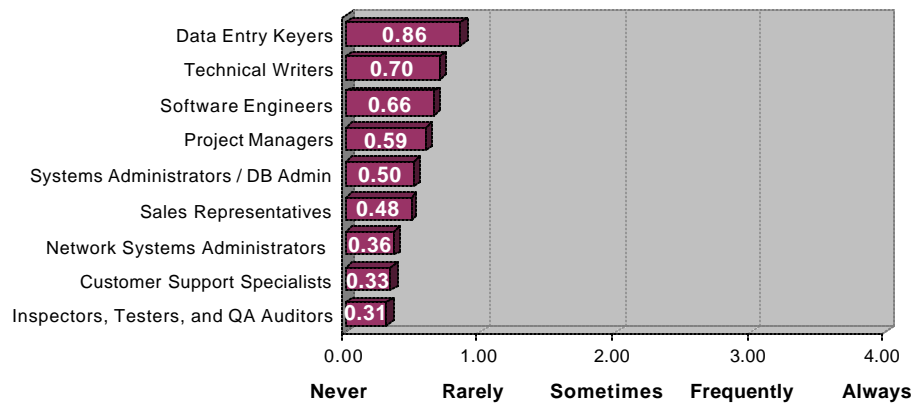


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Data Entry Keyers in part-time positions with greater frequency than they did any other SOFT occupation, but even so, their frequency of hiring part-time Data Entry Keyers still only averaged between 'never' and 'rarely' (0.86). For all nine of the occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure 59).

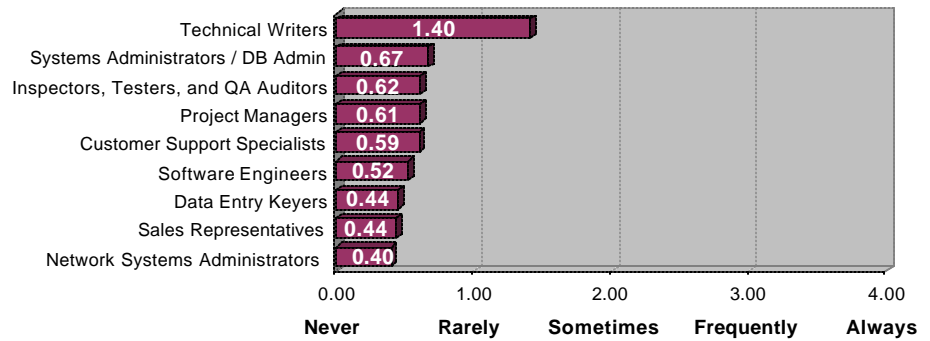
Figure 59. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Technical Writers (1.40) was the occupation where temporary employees were most frequently hired, followed by Systems Administrators / DB Administrators (0.67), and Inspectors, Testers, and QA Auditors (0.62). It should be noted that the frequency of hiring temporary workers for eight of the nine SOFT occupations ranged between 'never' and 'rarely', with firms hiring temporary Network Systems Administrators (0.40) with the lowest frequency (see Figure 60).

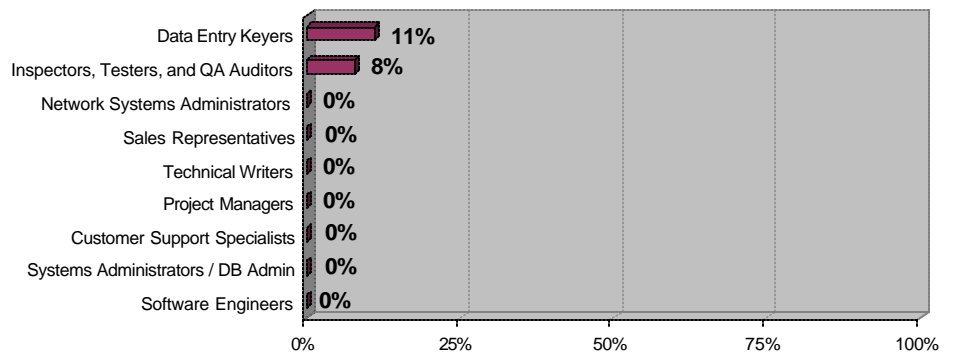
Figure 60. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the nine SOFT occupations. Eleven percent of firms hired non-English speaking Data Entry Keyers, followed by Inspectors, Testers, and QA Auditors (8%). For the remaining seven occupations, firms did not hire non-English speaking applicants.

Figure 61. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Computer Software survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

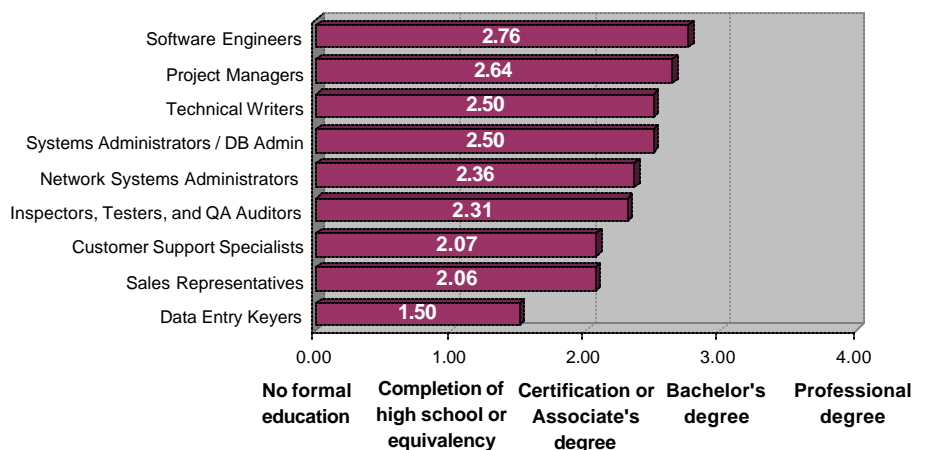
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the nine SOFT occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Software Engineers had the highest average education requirement (2.76), with most respondents agreeing the position required a Bachelor’s degree. Data Entry Keyers had the lowest average educational requirements (1.50), with respondents indicating that applicants needed, on average, slightly more than completion of high school or its equivalent to be successful. For eight of the nine positions examined, respondents indicated that at least a Certificate or Associate’s degree was the average education level of successful applicants (see Figure 62).

Figure 62. Mean Education Requirements by Occupation

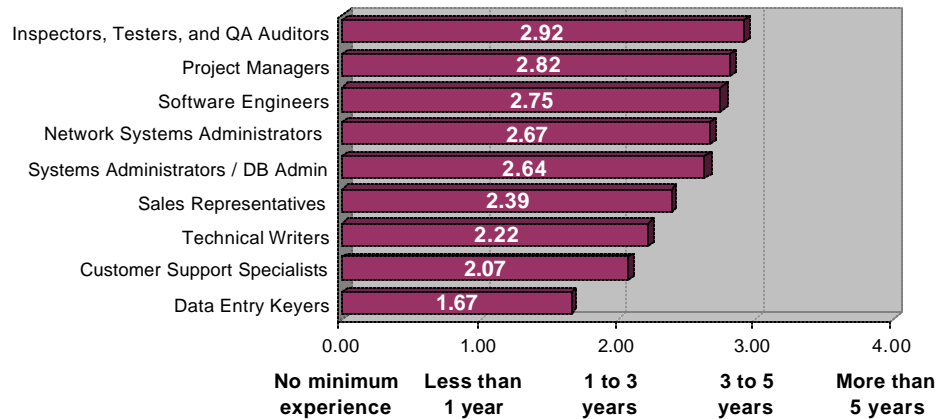


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to Question 19 were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Inspectors, Testers, and QA Auditors had the highest average experience requirement (2.92) of the nine occupations examined, followed by Project Managers (2.82), Software Engineers (2.75), and Network Systems Administrators (2.67). On the opposite end of the spectrum, Data Entry Keyers had the lowest average experience requirements (1.67) for applicants’ success (see Figure63).

Figure 63. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each SOFT occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

Fifty-nine percent of firms felt technical competence specific to the position was the most important skill for Software Engineers and 28 percent of firms felt that their employees were currently deficient in this skill. For Inspectors, Testers, and QA Auditors, 54 percent of firms felt that technical competence specific to the position was the most important and 31 percent of firms noted that employees were deficient in communication skills. Figures 64 through 72 display skill importance and deficiency by each occupation.

Figure 64. Software Engineers: Skill Importance and Deficiency

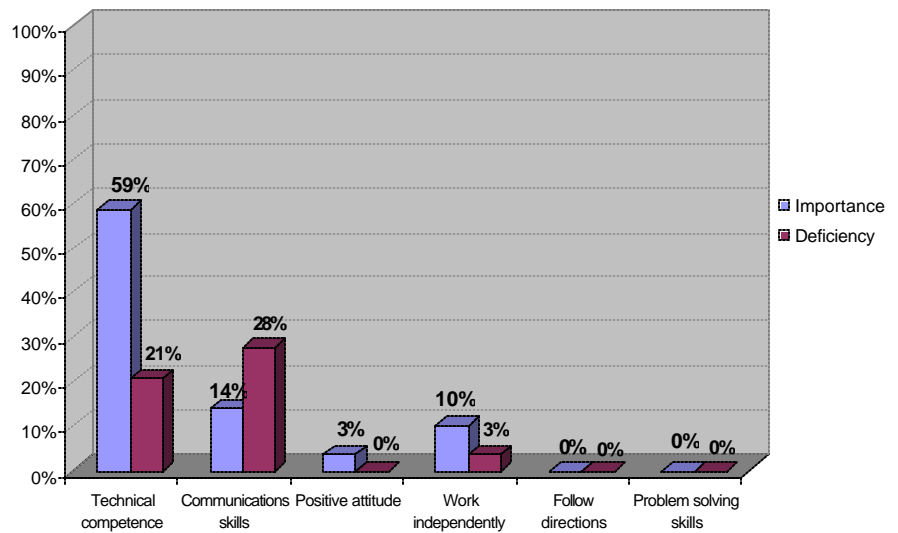


Figure 65. Systems Administrators / DB Administrators: Skill Importance and Deficiency

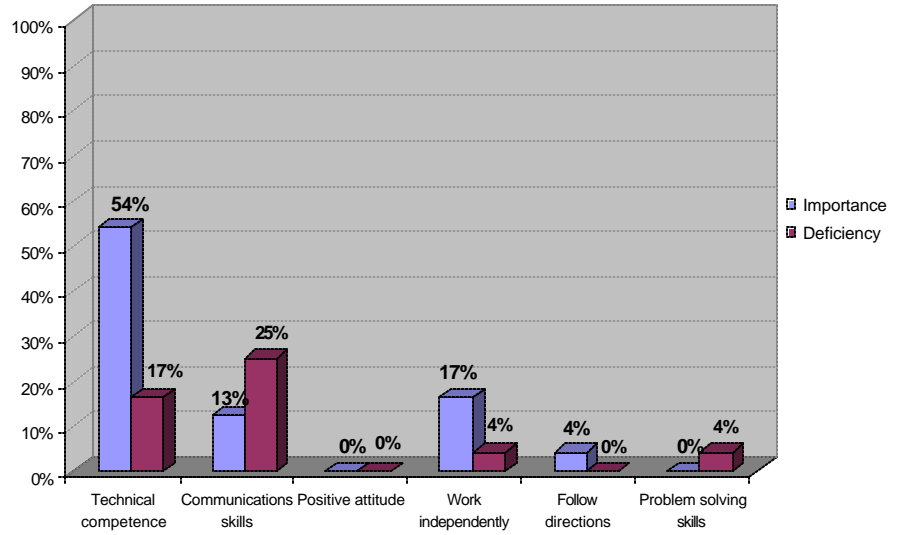


Figure 66. Customer Support Specialists: Skill Importance and Deficiency

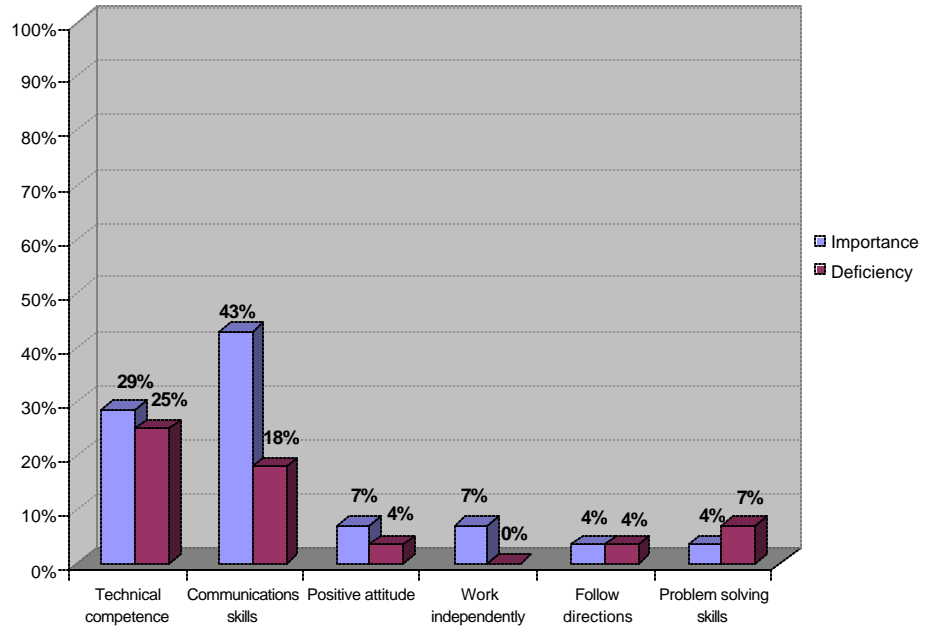


Figure 67. Project Managers: Skill Importance and Deficiency

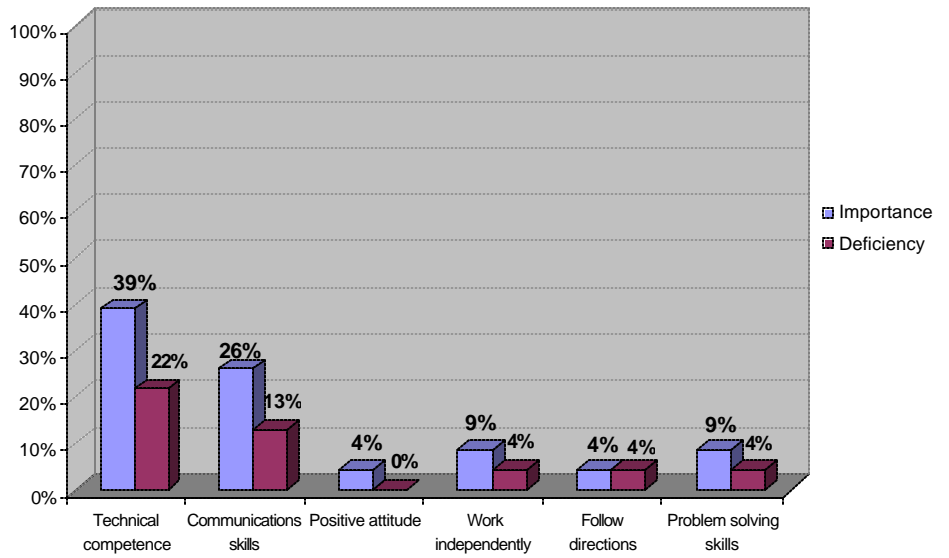


Figure 68. Technical Writers: Skill Importance and Deficiency

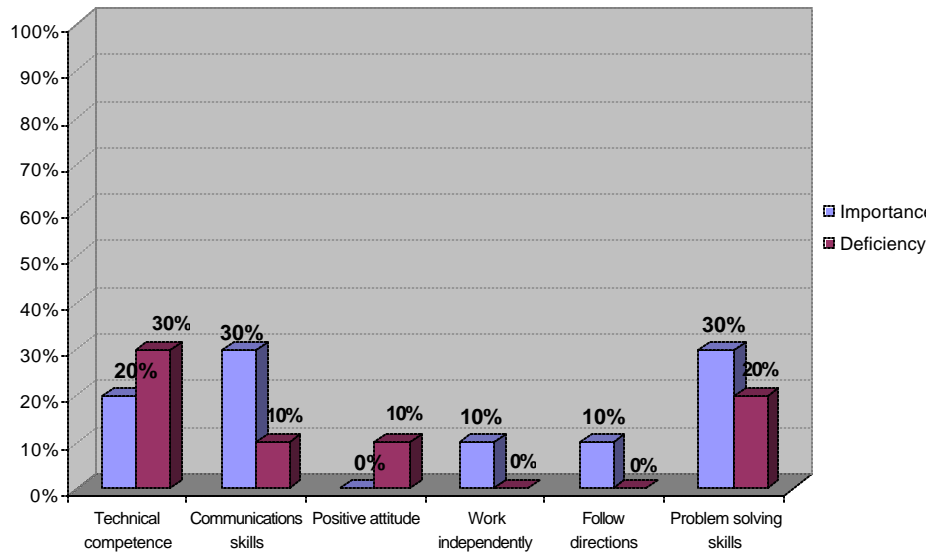


Figure 69. Sales Representatives: Skill Importance and Deficiency

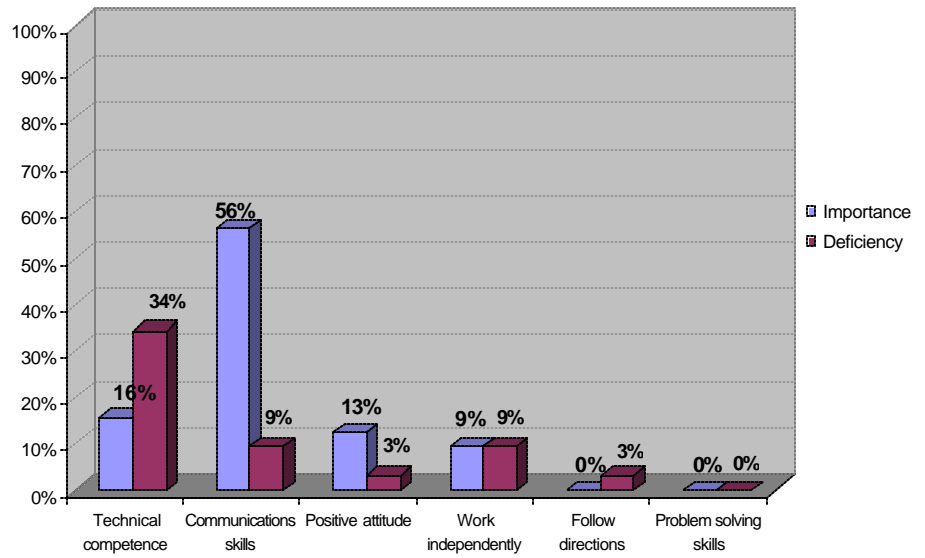


Figure 70. Inspectors, Testers, and QA Auditors: Skill Importance and Deficiency

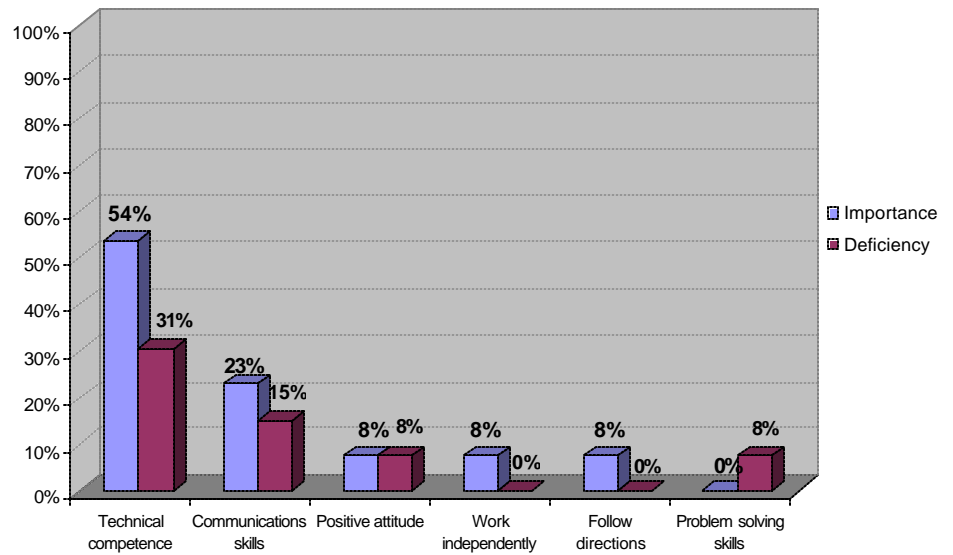


Figure 71. Network or Systems Administrators: Skill Importance and Deficiency

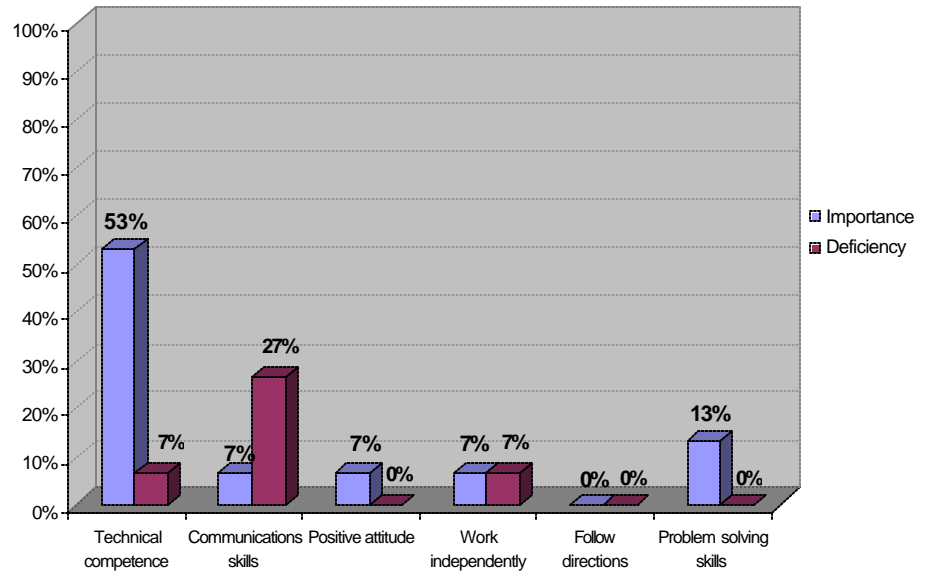
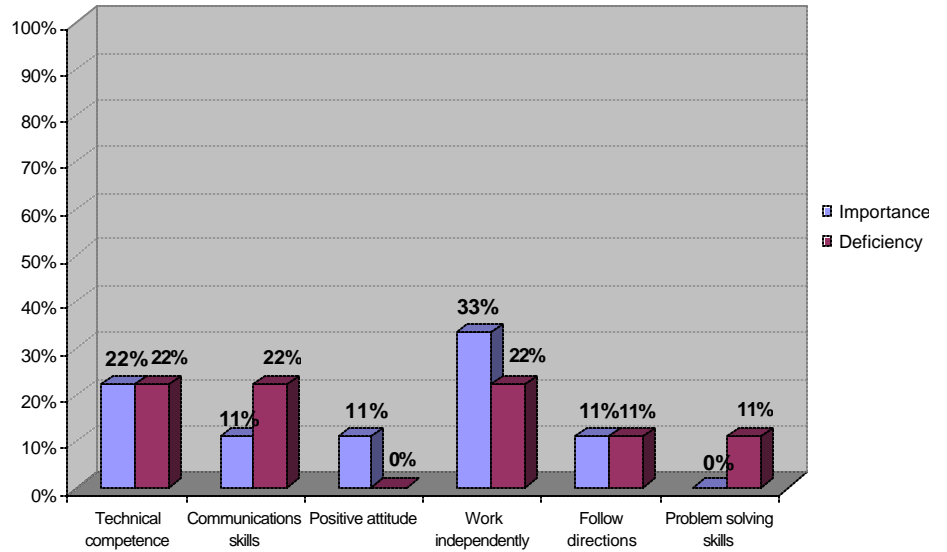


Figure 72. Data Entry Keyers: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, 10 to 33 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For SOFT, Technical Writers and Data Entry keyers received less than ten responses for both entry-level and experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Technical Writers had the highest median^{xx} and mean^{xxi} entry-level annual wage (\$45,000 and \$43,691, respectively) as well as the highest median experienced annual wage (\$54,000) of the SOFT occupations examined. Network Systems Administrators and Project Managers, along with Technical Writers, were the only occupations in SOFT to receive more than \$50,000 as the experienced median wage.

Table 20. Computer Software Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Software Engineers	Entry-Level	\$39,500	\$41,291	\$19,240	\$70,000
	Experienced	\$45,000	\$47,456	\$22,880	\$77,000
Systems Administrators / DB Admin	Entry-Level	\$36,500	\$41,100	\$26,000	\$70,000
	Experienced	\$45,290	\$49,723	\$29,000	\$75,000
Customer Support Specialists	Entry-Level	\$30,000	\$30,345	\$14,560	\$65,000
	Experienced	\$37,450	\$38,349	\$20,000	\$75,000
Project Managers	Entry-Level	\$42,300	\$43,172	\$19,240	\$80,000
	Experienced	\$51,750	\$53,549	\$22,880	\$100,000
Technical Writers	Entry-Level	\$45,000	\$43,691	\$28,000	\$65,000
	Experienced	\$54,000	\$51,286	\$31,000	\$60,000
Sales Representatives	Entry-Level	\$40,000	\$38,487	\$14,400	\$75,000
	Experienced	\$45,000	\$45,412	\$22,880	\$100,000
Inspectors, Testers, and Quality Assurance Auditors	Entry-Level	\$42,500	\$41,167	\$14,001	\$60,000
	Experienced	\$48,075	\$47,705	\$16,000	\$70,000
Network Systems Administrators	Entry-Level	\$42,000	\$43,531	\$29,000	\$60,000
	Experienced	\$50,000	\$50,208	\$30,000	\$65,000
Data Entry Keyers	Entry-Level	\$24,460	\$26,160	\$19,240	\$40,000
	Experienced	\$28,080	\$31,168	\$22,880	\$50,000

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Software Engineers, Systems Administrators / DB Administrators, Project Managers, Technical Writers, Sales Representatives, Inspectors, Testers, and Quality Assurance Auditors, and Network Systems Administrators, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Customer Support Specialists and Data Entry Keyers the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xx}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Data Entry Keyers the entry-level median wage of \$24,460 means that half of the *entry-level* wages given for Data Entry Keyers lie above \$24,460 and the other half of Data Entry Keyers *entry-level* wages lie below \$24,460.

^{xxi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Construction

The Construction industry (CON) cluster is made up of firms that build, improve, and demolish buildings throughout Orange County as well as those firms that specialize in a specific portion of the process.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 87 percent of CON employees worked full-time, 13 percent worked part-time, and four percent were temporary employees (see Table 21). The current workforce of more than 60,000 employees is expected to increase by eight percent in the next 12 months^{xxii}. The expected increase in industry employment represents over 5,000 new jobs for Orange County.

Table 21. Industry Employment Practices^{xxiii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
CON	60,159	52,342 87%	7,817 13%	2,174 4%	5,091 8%

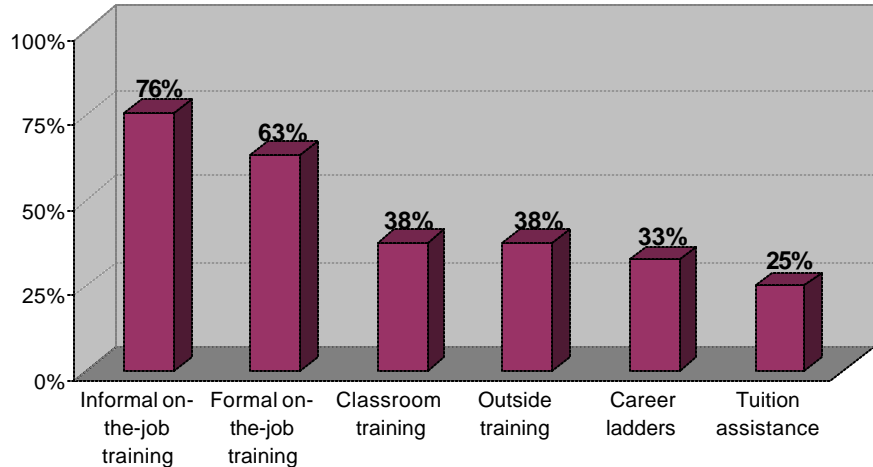
^{xxii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xxiii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 76 percent of firms reported that they typically utilized informal on-the-job training at their business location, 63 percent used formal on-the-job training, 38 percent offered in-house classroom training, 38 percent used employer-paid outside training, 33 percent utilized career development or career ladders, and 25 percent offered employees tuition assistance at a college or university (see Figure73).

Figure 73. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 22 percent of Construction firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table22). In the last 12 months, approximately one in every 52 employees within Construction was hired using an H-1B Visa (see Table23).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 22. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
974	4,453	21.88%

Table 23. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
1,154	60,159	1.92%

Construction Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For Construction, the survey examined ten occupations: Carpenters, Drywall Installers and Tapers, Plumbers, Pipefitters, and Steamfitters, Electricians, Cement Masons, Painters and Paperhangers, Operating Engineers or Construction Machine Operators, Construction Managers, Roofers, Construction Trade Helpers. Due to insufficient sample size, occupational data will not be presented for Construction Trade Helpers. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the ten occupations included in the CON survey. Respondents were then asked detailed, occupation-specific questions about six occupations that were randomly selected from among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Drywall Installers and Tapers and Plumbers, Pipefitters, and Steamfitters are expected to have the highest percentage turnover of the occupations examined (29% and 21%, respectively), whereas Carpenters (3%) and Painters and Paperhangers (5%) are expected to have the lowest turnover. Plumbers, Pipefitters, and Steamfitters and Operating Engineers or Construction Machine Operators had the highest 12-month rate of expected growth among CON occupations, with 19 percent and 18 percent, respectively. Drywall Installers and Tapers (-5%), Carpenters (-3%), and Cement Masons (-1%) were the only CON occupations with negative expected growth over the next 12 months. Electricians will have the most openings in the next 12 months (762), followed closely by Drywall Installers and Tapers (705) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 24).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 24. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xxiv}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Electricians	4,413	7.3%	13%	5%	762
Drywall Installers and Tapers	3,029	5.0%	29%	-5%	705
Operating Engineers or Con. Machine Operators	1,699	2.8%	11%	18%	488
Painters and Paperhangers	4,255	7.1%	5%	4%	404
Construction Managers	1,787	3.0%	14%	3%	303
Plumbers, Pipefitters, and Steamfitters	606	1.0%	21%	19%	245
Cement Masons	1,149	1.9%	8%	-1%	79
Roofers	361	0.6%	15%	0%	54
Carpenters	8,283	13.8%	3%	-3%	15
Cluster Total	60,159	100%	11%	8%	11,755

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

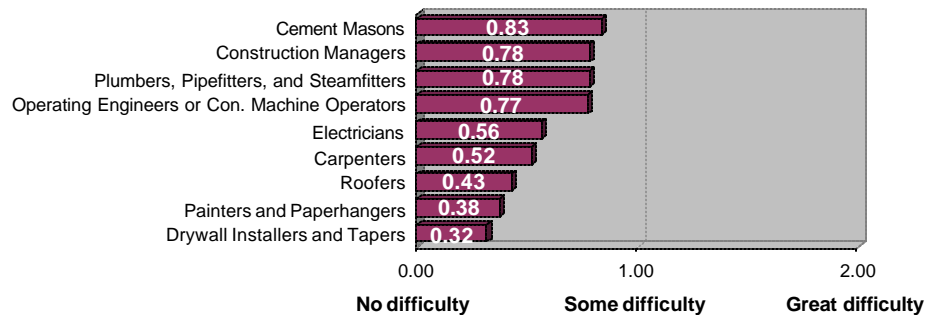
^{xxiv}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 12 CON occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. CON firms had the most difficulty locating experienced Cement Masons (0.83), Construction Managers (0.78), Plumbers, Pipefitters, and Steamfitters (0.78), and Operating Engineers or Construction Machine Operators (0.77).

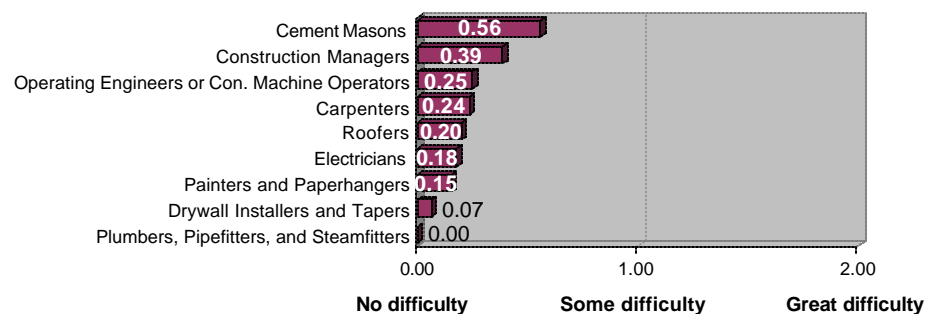
Figure 74. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Cement Masons (0.56) and Construction Managers (0.39), whereas firms did not have any difficulty finding non-experienced Plumbers, Pipefitters, and Steamfitters (0.00).

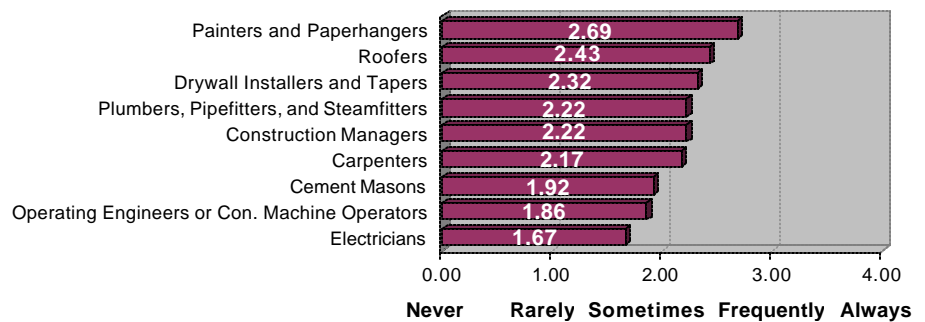
Figure 75. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Painters and Paperhangers (2.69) was the occupation most often recruited from outside the County, followed by Roofers (2.43), Drywall Installers and Tapers (2.32), Plumbers, Pipefitters, and Steamfitters (2.22), and Construction Managers (2.22). It should be noted that for six of the nine occupations, firms ‘sometimes’ to ‘frequently’ recruited outside the County.

Figure 76. Recruitment Outside of Orange County

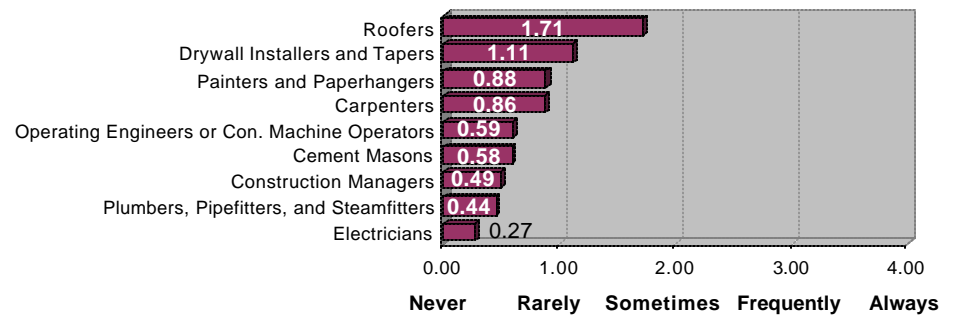


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Roofers in part-time positions with greater frequency than they did any other CON occupation, but even so, their frequency of hiring part-time Telemarketers and Solicitors still only averaged between 'rarely' and 'sometimes' (1.71). For seven of the nine occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure77).

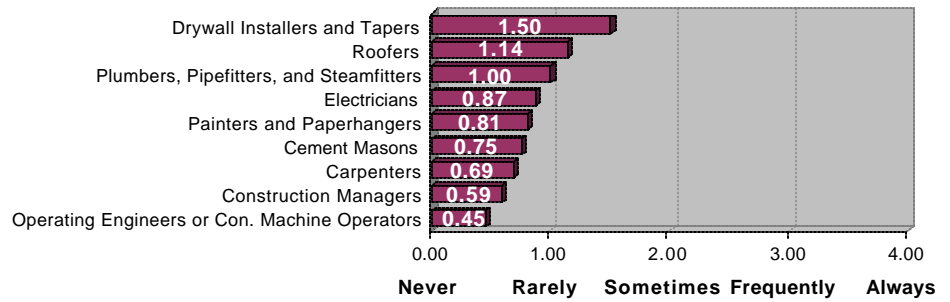
Figure 77. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Drywall Installers and Tapers (1.50) was the occupation where temporary employees were most frequently hired, followed by Roofers (1.14) and Plumbers, Pipefitters, and Steamfitters (1.00). It should be noted that the frequency of hiring temporary workers for six of the nine CON occupations ranged between 'never' and 'rarely', with firms hiring temporary Operating Engineers or Construction Machine Operators (0.45) with the lowest frequency (see Figure 78).

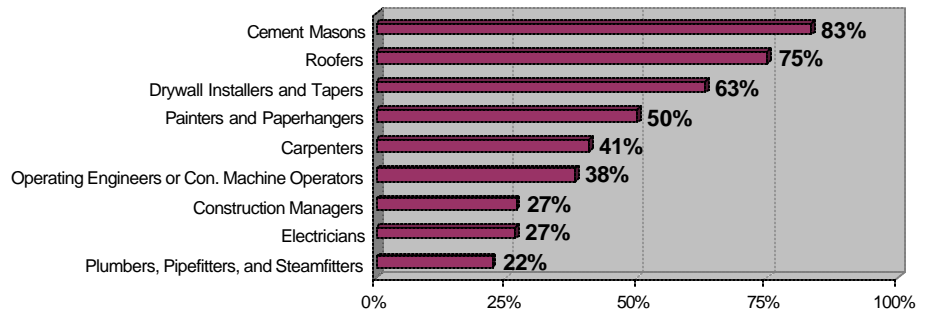
Figure 78. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the nine CON occupations. Eighty-three percent of firms hired non-English speaking Cement Masons, followed by Roofers (75%), Drywall Installers and Tapers (63%), and Painters and Paperhangers (50%).

Figure 79. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Construction survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

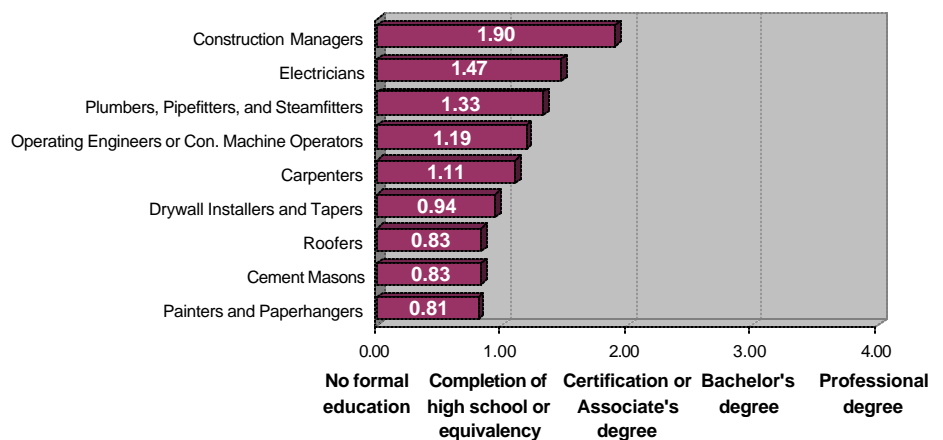
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the nine CON occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Construction Managers had the highest average education requirement (1.90), with most respondents agreeing the position required a certification or an Associate’s degree. Painters and Paperhangers had the lowest average educational requirements (0.81), with respondents indicating that applicants needed, on average, completion of high school or its equivalent to be successful. For five of the nine positions examined, respondents indicated that at least completion of high school or it equivalent was the average education level of successful applicants (see Figure80).

Figure 80. Mean Education Requirements by Occupation

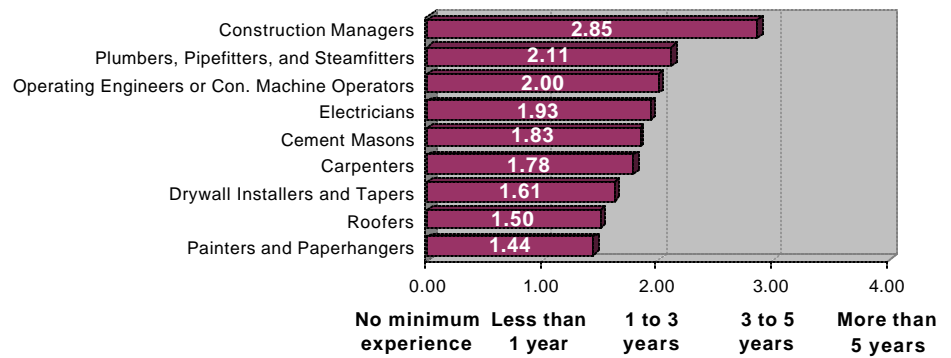


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to Question 19 were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Construction Managers had the highest average experience requirement (2.85) of the nine occupations examined, followed by Plumbers, Pipefitters, and Steamfitters (2.11), Operating Engineers or Construction Machine Operators (2.00), and Electricians (1.93). On the opposite end of the spectrum, Painters and Paperhangers had the lowest average experience requirements (1.44) for applicants’ success (see Figure 81).

Figure 81. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each CON occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

For each CON occupation, firms felt technical competence specific to the position was the most important skill. For Cement Masons, 42 percent of firms felt that technical competence was the most important and the same percentage of firms, 42 percent, noted that employees were deficient in technical competence specific to the position. Figures 82 through 90 display skill importance and deficiency by each occupation.

Figure 82. Carpenters: Skill Importance and Deficiency

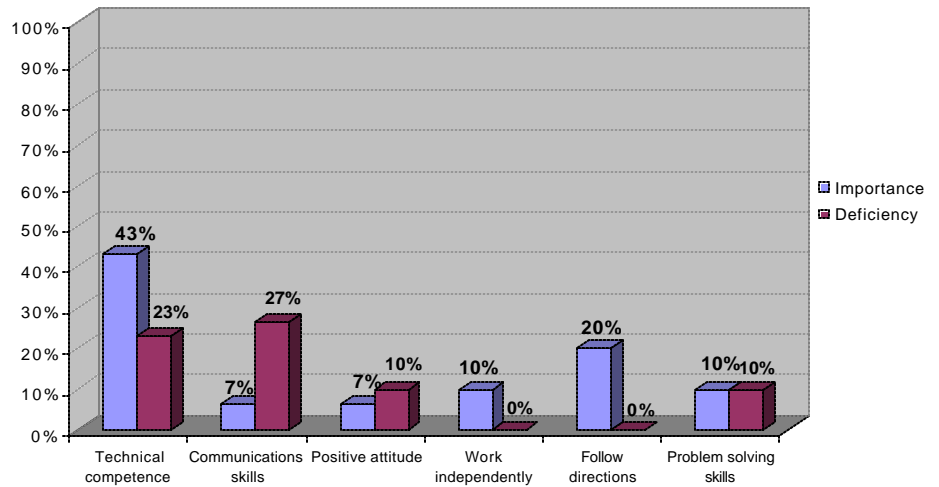


Figure 83. Drywall Installers and Tapers: Skill Importance and Deficiency

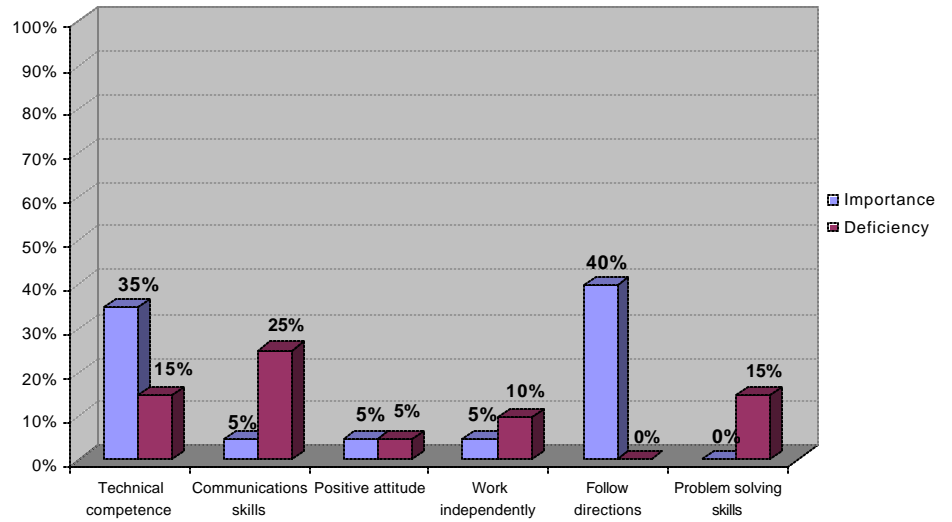


Figure 84. Plumbers, Pipefitters, and Steamfitters: Skill Importance and Deficiency

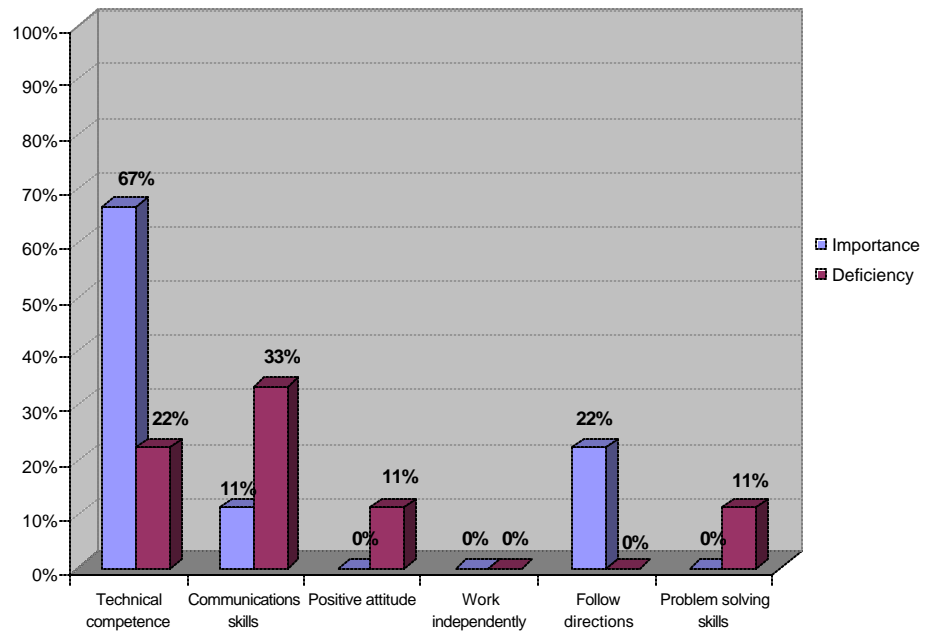


Figure 85. Electricians: Skill Importance and Deficiency

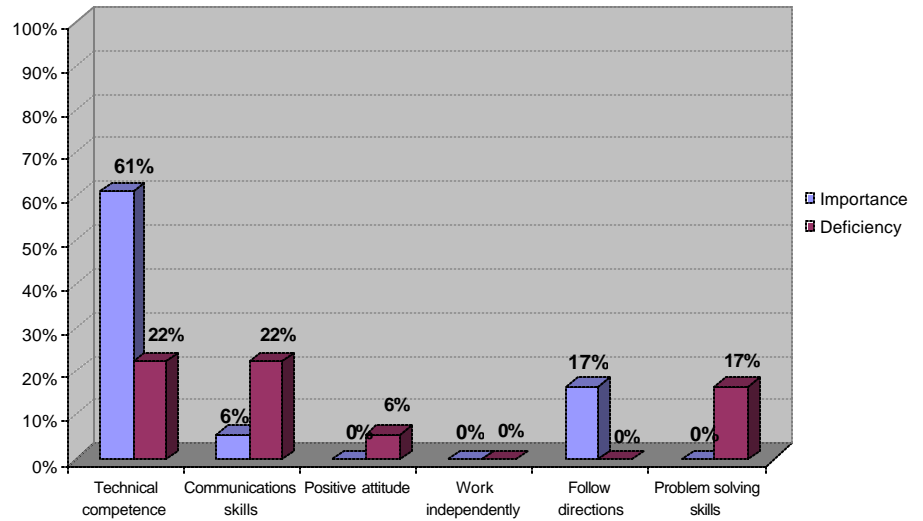


Figure 86. Cement Masons: Skill Importance and Deficiency

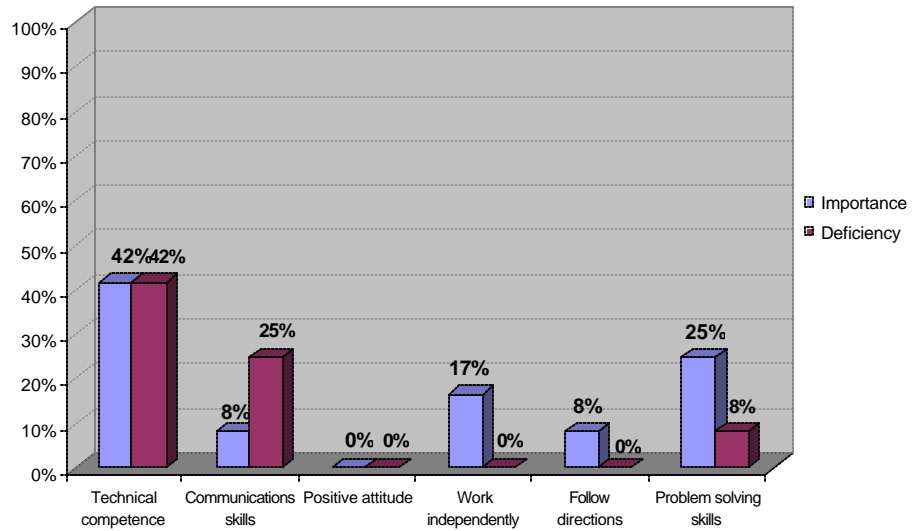


Figure 87. Painters and Paperhangers: Skill Importance and Deficiency

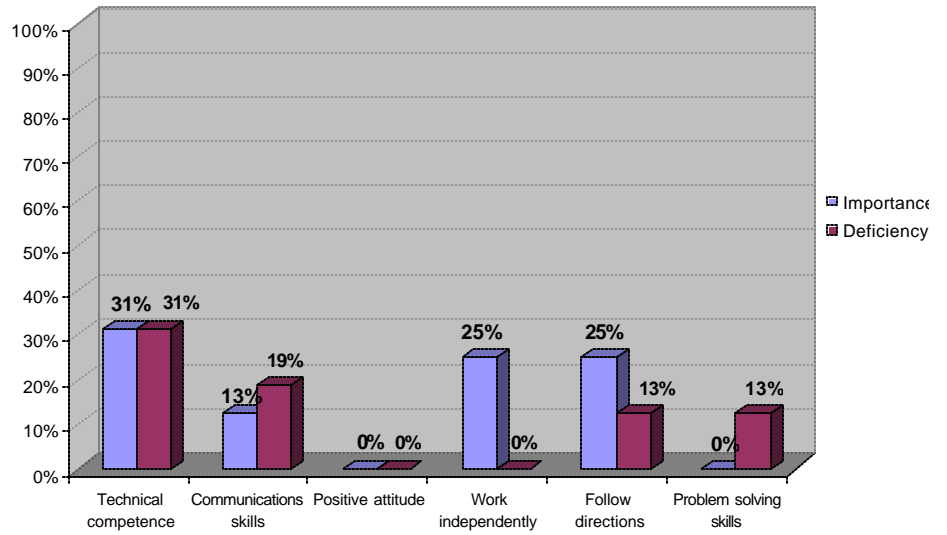


Figure 88. Operating Engineers or Construction Machine Operators: Skill Importance and Deficiency

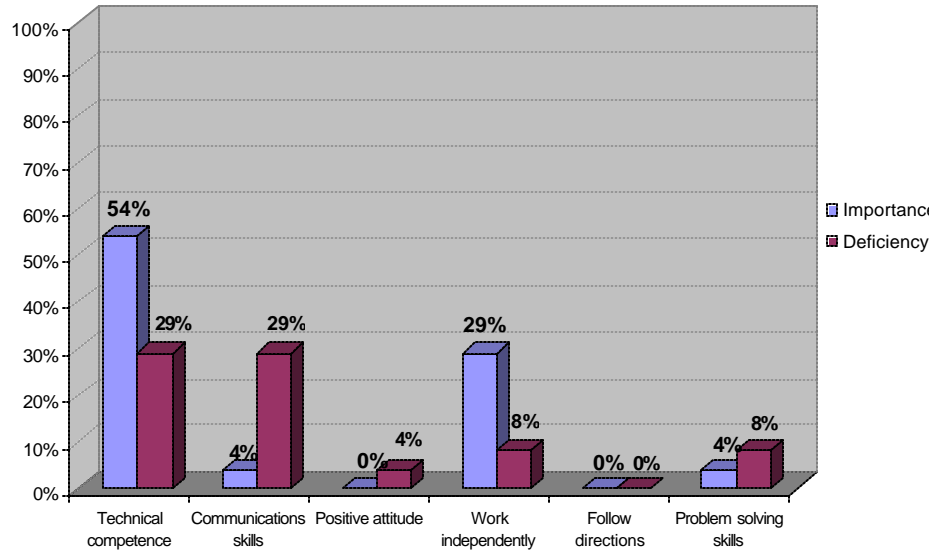


Figure 89. Construction Managers: Skill Importance and Deficiency

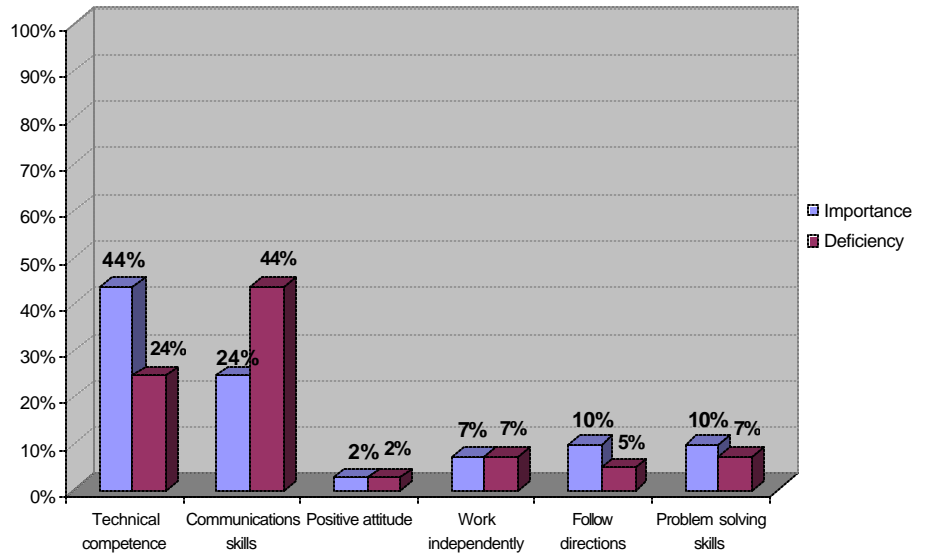
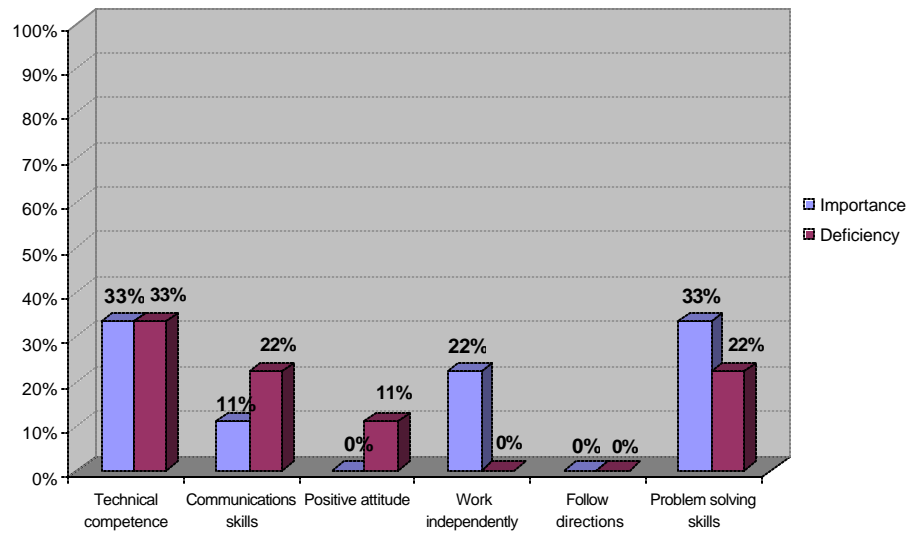


Figure 90. Roofers: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, five to 33 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For CON, Plumbers, Pipefitters, and Steamfitters and Roofers received less than ten responses for both entry-level and experienced wages. In addition, Painters and Paperhangers received less than ten responses for experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Construction Managers had the highest median^{xxv} and mean^{xxvi} entry-level annual wage (\$42,630 and \$45,216, respectively) as well as the highest mean experienced annual wage (\$51,578) of the CON occupations examined. Operating Engineers or Construction Machine Operators were the only occupations in CON to receive more than \$50,000 as the experienced median wage.

Table 25. Construction Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Carpenters	Entry-Level	\$41,912	\$40,641	\$18,720	\$61,880
	Experienced	\$48,880	\$45,972	\$31,200	\$72,800
Drywall Installers and Tapers	Entry-Level	\$30,160	\$30,680	\$16,640	\$43,680
	Experienced	\$37,440	\$38,953	\$31,200	\$52,000
Plumbers, Pipefitters, and Steamfitters	Entry-Level	\$28,080	\$34,667	\$24,960	\$52,000
	Experienced	\$35,360	\$43,680	\$31,200	\$66,560
Electricians	Entry-Level	\$31,200	\$31,590	\$18,720	\$41,600
	Experienced	\$37,440	\$42,139	\$31,200	\$72,800
Cement Masons	Entry-Level	\$31,200	\$29,018	\$15,080	\$46,405
	Experienced	\$35,360	\$39,673	\$24,960	\$72,800
Painters and Paperhangers	Entry-Level	\$24,960	\$24,544	\$16,640	\$35,360
	Experienced	\$29,120	\$30,622	\$18,720	\$43,680
Operating Engineers or Con. Machine Operators	Entry-Level	\$33,124	\$39,863	\$16,640	\$83,200
	Experienced	\$52,000	\$49,287	\$29,120	\$83,200
Construction Managers	Entry-Level	\$42,630	\$45,216	\$16,640	\$72,800
	Experienced	\$45,920	\$51,578	\$31,200	\$83,200
Roofers	Entry-Level	\$31,200	\$32,587	\$24,960	\$41,600
	Experienced	\$37,440	\$36,747	\$31,200	\$41,600

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Construction Managers, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Carpenters, Drywall Installers and Tapers, Plumbers, Pipefitters, and Steamfitters, Electricians, Cement Masons, Painters and Paperhangers, Operating Engineers or Construction Machine Operators, Roofers, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xxv}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Cement Masons the entry-level median wage of \$31,200 means that half of the *entry-level* wages given for Cement Masons lie above \$31,200 and the other half of Cement Masons *entry-level* wages lie below \$31,200.

^{xxvi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Defense and Aerospace Industry

The Defense and Aerospace Industry (DnA) cluster is made up of firms that are primarily engaged in manufacturing, developing, and/or assembling aircraft, ships, and defense-related products.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 93 percent of DnA employees worked full-time, seven percent worked part-time, and two-tenths of a percent were temporary employees (see Table 26). The current workforce of almost 23,000 employees is expected to increase by 4 percent in the next 12 months^{xxvii}. The expected increase in industry employment represents almost 900 new jobs for Orange County.

Table 26. Industry Employment Practices^{xxviii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
DnA	22,970	21,396 93%	1,574 7%	46 0.2%	860 4%

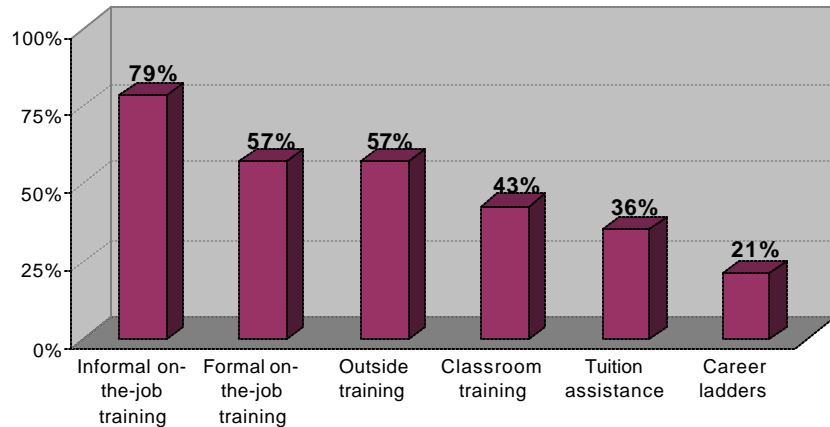
^{xxvii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xxviii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 79 percent of DnA firms reported that they typically utilized informal on-the-job training at their business location, 57 percent used formal on-the-job training, 57 percent offered employer-paid outside training, 43 percent utilized in-house classroom training, 36 percent offered employees tuition assistance at a college or university, and 21 percent of DnA firms offered career development or career ladders (see Figure 91).

Figure 91. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 14 percent of DnA firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table 27). In the last 12 months, approximately one in every 2500 employees within the DnA industry was hired using an H-1B Visa (see Table 28).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 27. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
29	204	14.29%

Table 28. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
9	22,970	0.04%

Defense and Aerospace Industry Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For the Defense and Aerospace Industry, the survey examined 11 occupations: General Machinists, Sheet Metal Mechanics and Welders, Assemblers and Fabricators, Electrical and Electronic Assemblers, Mechanical Engineers, Engineering Technicians, Electrical and Electronic Engineers, Electricians, General Maintenance Repairers, Computer Engineers and Programmers, and Inspectors and Testers. (See Appendix A for the definition used for each occupation within the survey.) Due to insufficient sample size, occupational data will not be presented for Electricians.

Respondents were first asked whether their company employed individuals, at their business location, for any of the 11 occupations included in the DnA survey. Respondents were then asked detailed, occupation-specific questions for as many as six occupations that were randomly selected among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Computer Engineers and Programmers and Assemblers and Fabricators are expected to have the highest percentage turnover of the occupations examined (9%), whereas General Maintenance Repairers (0%) should have the lowest. General Maintenance Repairers and Engineering Technicians had the highest 12-month rate of expected growth among DnA occupations, with 17 percent and 10 percent, respectively. General Machinists (-15%), Assemblers and Fabricators (-9%), Electrical and Electronics Assemblers (-9%), Sheet Metal Mechanics and Welders (-8%), were the DnA occupations with negative expected growth over the next 12 months. Electrical and Electronic Engineers will have the most openings in the next 12 months, although with only 23 openings this is still quite small (see Table 29).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 29. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xxix}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Electrical and Electronic Engineers	478	2.1%	1%	4%	23
Mechanical Engineers	356	1.5%	1%	4%	19
Engineering Technicians	108	0.5%	3%	10%	14
General Maintenance Repairers	74	0.3%	0%	17%	12
Computer Engineers / Programmers	57	0.2%	9%	0%	5
Inspectors and Testers	99	0.4%	5%	0%	5
General Machinists	1,961	8.5%	2%	-15%	0
Sheet Metal Mechanics / Welders	460	2.0%	3%	-8%	0
Assemblers and Fabricators	792	3.4%	9%	-9%	0
Electrical and Electronic Assemblers	356	1.5%	2%	-9%	0
Cluster Total	22,970	100%	11%	4%	860

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

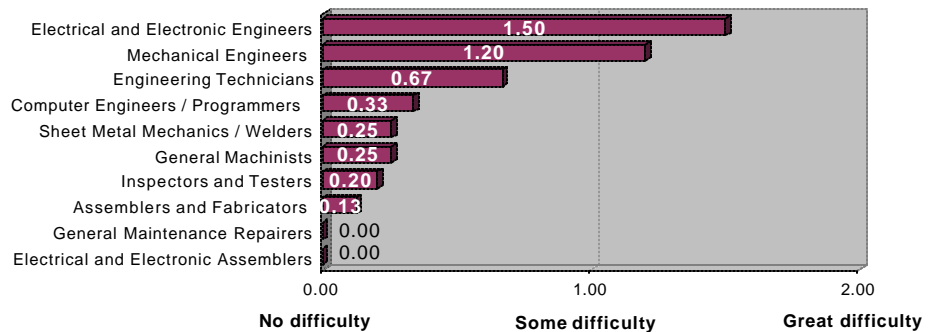
^{xxix}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 10 DnA occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. DnA firms had the most difficulty locating experienced Electrical and Electronic Assemblers (1.50), Mechanical Engineers (1.20), and Engineering Technicians (0.67).

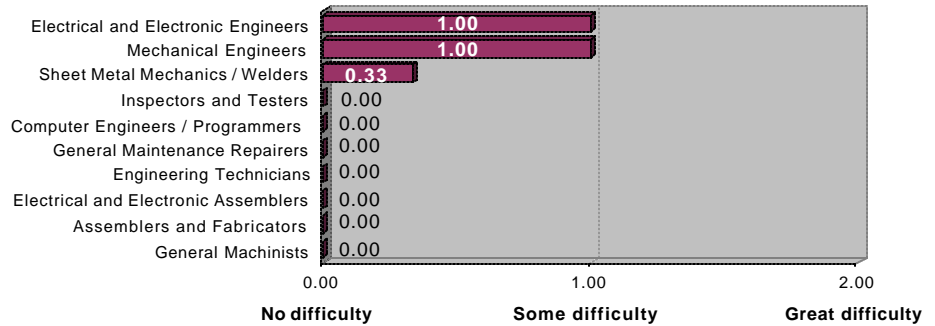
Figure 92. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Electrical and Electronic Engineers (1.00), Mechanical Engineers (1.00), and Sheet Metal Mechanics and Welders (0.33) whereas firms did not have any difficulty finding non-experienced employees for all of the other DnA occupations examined (0.00).

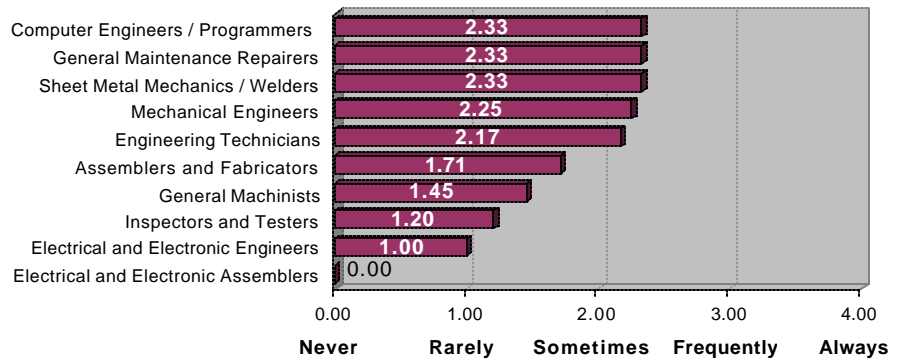
Figure 93. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they 'always', 'frequently', 'sometimes', 'rarely', or 'never' recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' recruited outside Orange County for a given occupation. On average, Computer Engineers and Programmers, General Maintenance Repairers, and Sheet Metal Mechanics and Welders (2.33) were the occupations most often recruited from outside the County, followed by Mechanical Engineers (2.25), and Engineering Technicians (2.17). It should be noted that for 5 of the 10 occupations, firms 'sometimes' to 'frequently' recruited outside the County.

Figure 94. Recruitment Outside of Orange County

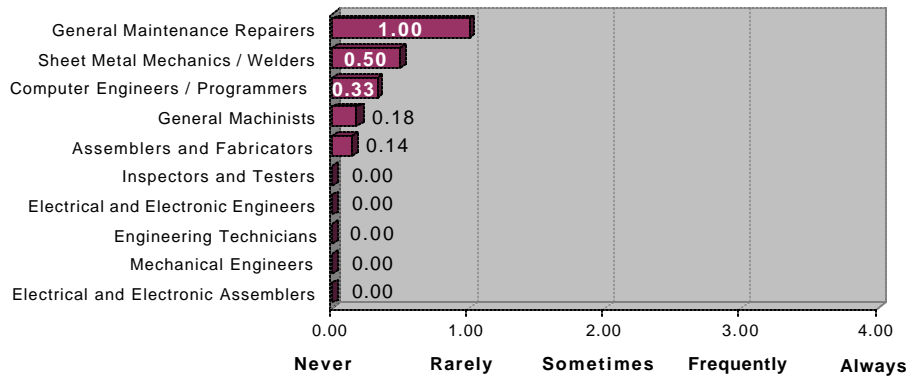


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired General Maintenance Repairers in part-time positions with greater frequency than they did any other DnA occupation, but even so, their frequency of hiring part-time General Maintenance Repairers still only averaged 'rarely' (1.00). For all ten of the occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure95).

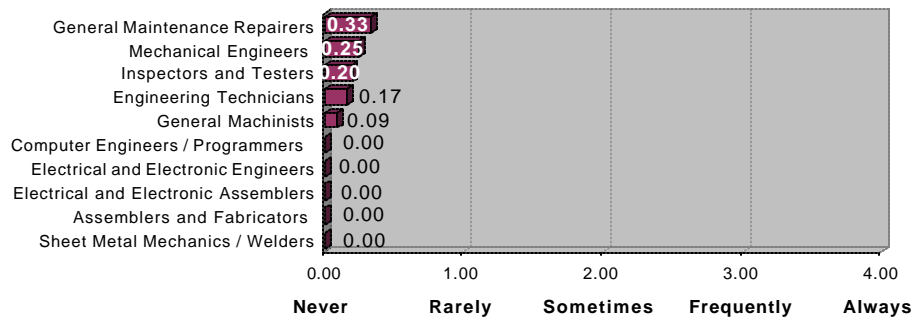
Figure 95. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, General Maintenance Repairers (0.33) was the occupation where temporary employees were most frequently hired, followed by Mechanical Engineers (0.25) and Inspectors and Testers (0.20). It should be noted that the frequency of hiring temporary workers for each of the 10 DnA occupations ranged between 'never' and 'rarely', with half of the DnA occupations surveyed never hiring temporary employees for that specific occupation.

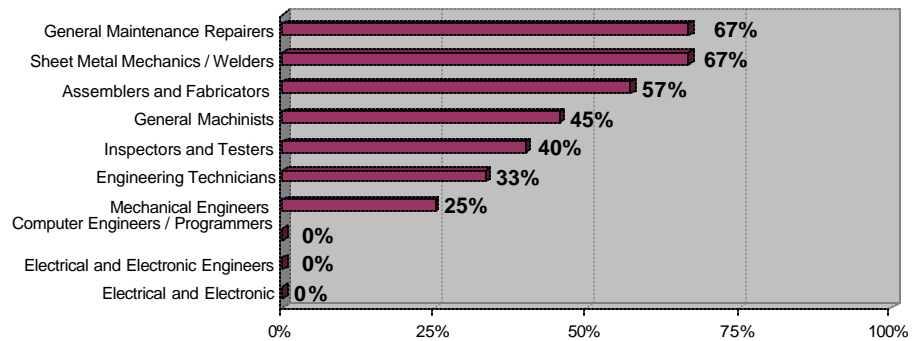
Figure 96. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the 10 DnA occupations. Sixty-seven percent of firms hired non-English speaking General Maintenance Repairers and Sheet Metal Mechanics, followed by Assemblers and Fabricators (57%), General Machinists (45%), and Inspectors and Testers (40%). On the other end of the spectrum, none of the firms hired non-English speaking Computer Engineers and Programmers, Electrical and Electronic Engineers, and Electrical and Electronic Assemblers.

Figure 97. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Defense and Aerospace survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

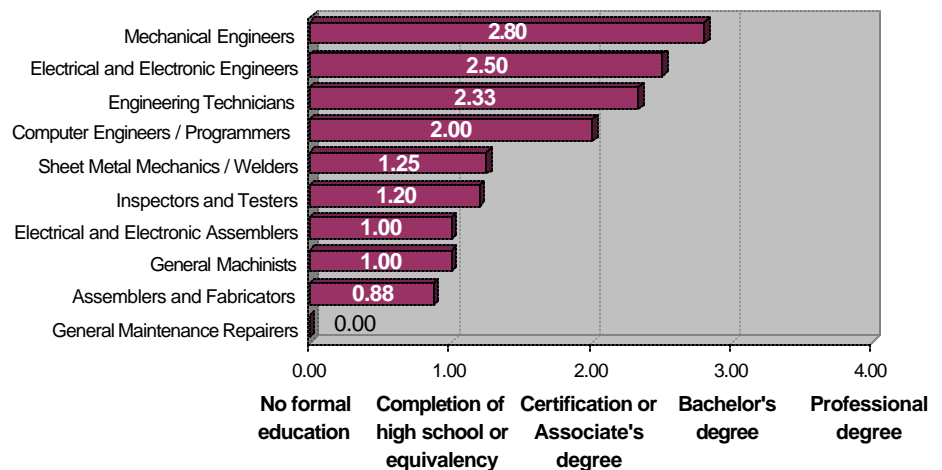
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the 10 DnA occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Mechanical Engineers had the highest average education requirement (2.80), with most respondents agreeing the position required a Bachelor’s degree. General Maintenance Repairers had the lowest average educational requirements (0.00), with respondents indicating that applicants needed no formal education requirements. For four of the 10 positions examined, respondents indicated that at least a Certificate or Associate’s degree was the average education level of successful applicants (see Figure98).

Figure 98. Mean Education Requirements by Occupation

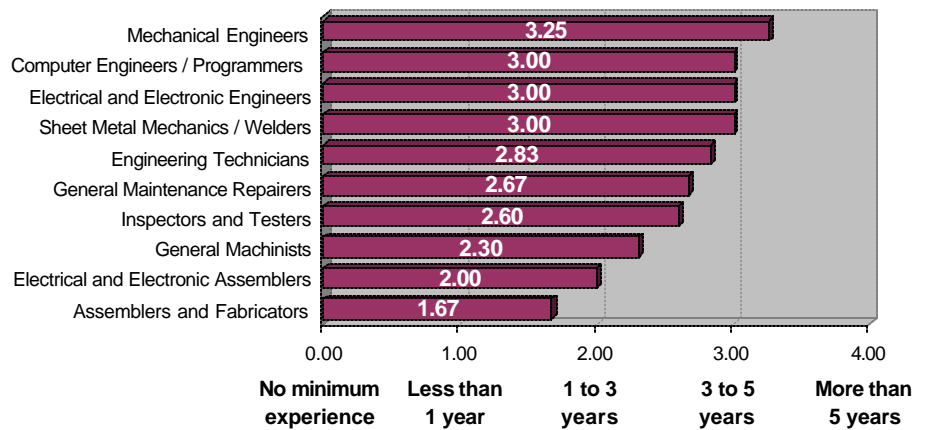


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to the following question related to experience were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Mechanical Engineers had the highest average experience requirement (3.25) of the 10 occupations examined, followed by Computer Engineers and Programmers (3.00), Electrical and Electronic Engineers (3.00), and Sheet Metal Mechanic and Welders(3.00). On the opposite end of the spectrum, Assemblers and Fabricators had the lowest average experience requirements (1.67) for applicants’ success (see Figure99).

Figure 99. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each DnA occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

One hundred percent of firms felt technical competence specific to the position was the most important skill for Electrical and Electronic Engineers with none of the firms indicating that their employees were currently deficient in any of the skills. Like Electrical and Electronic Engineers, all of the responding DnA firms stated the technical skills specific to the position were most important for Engineering Technicians, however approximately two-thirds of firms noted that Engineering Technicians were most deficient in their communication skills. Figures 100 through 109 display skill importance and deficiency by each DnA occupation.

Figure 100. General Machinists - Skill Importance and Deficiency

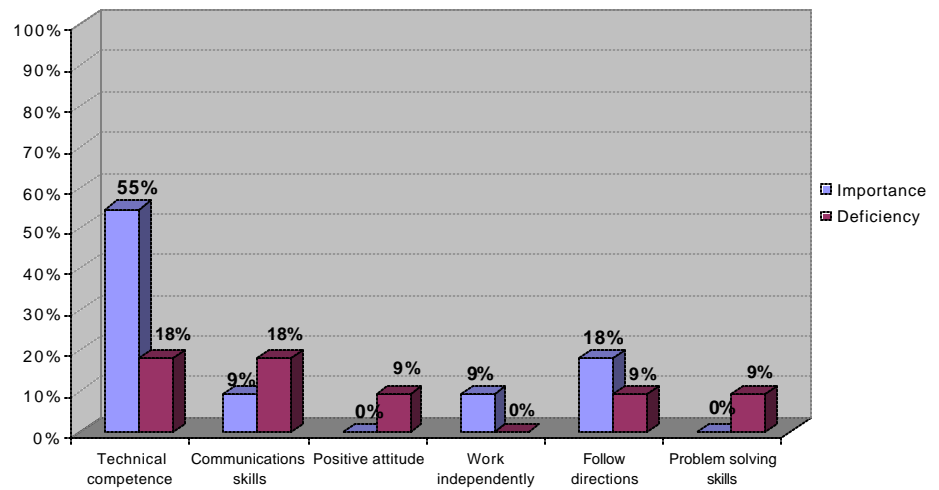


Figure 101. Sheet Metal Mechanics and Welders: Skill Importance and Deficiency

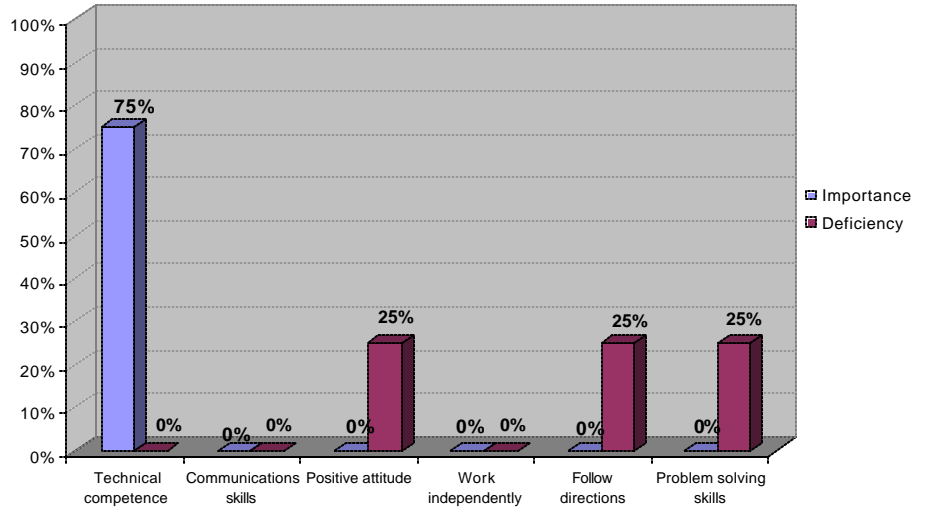


Figure 102. Assemblers and Fabricators: Skill Importance and Deficiency

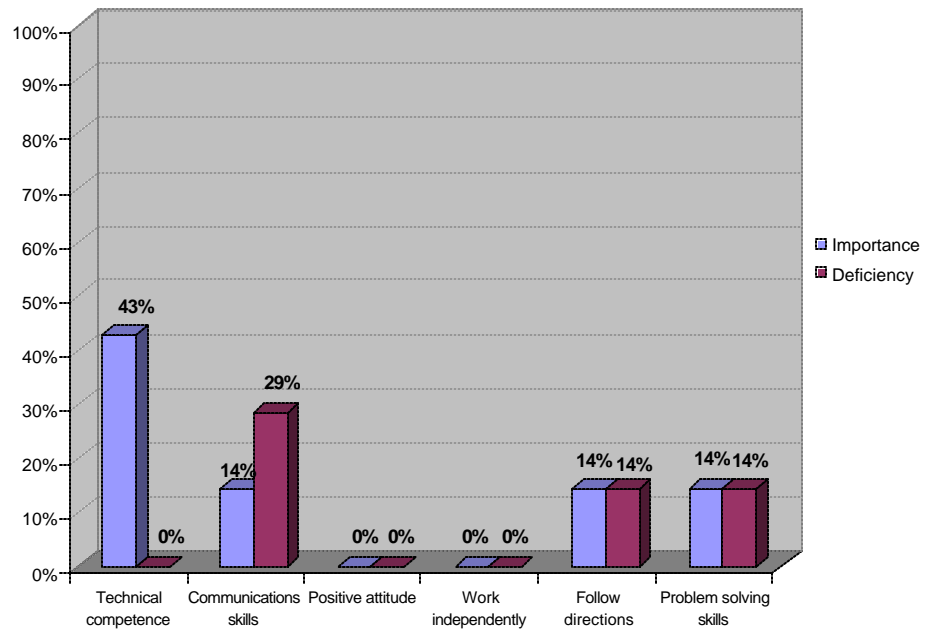


Figure 103. Electrical and Electronic Assemblers: Skill Importance and Deficiency

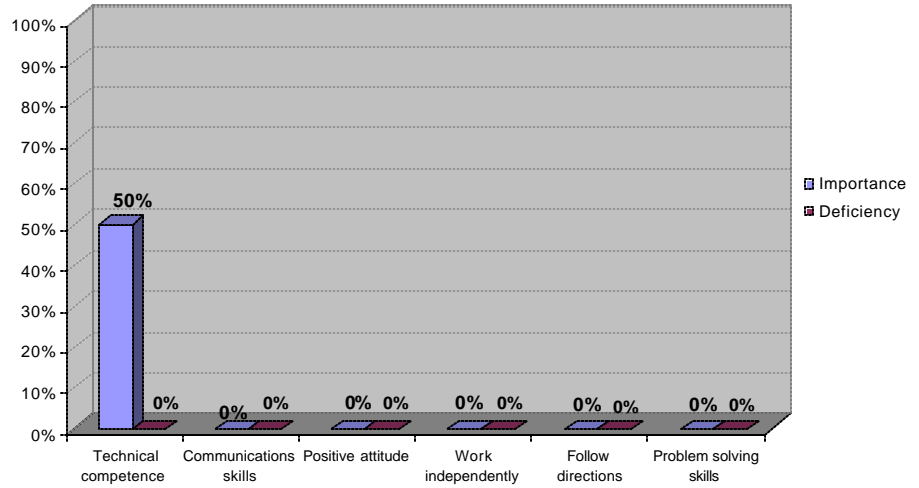


Figure 104. Mechanical Engineers: Skill Importance and Deficiency

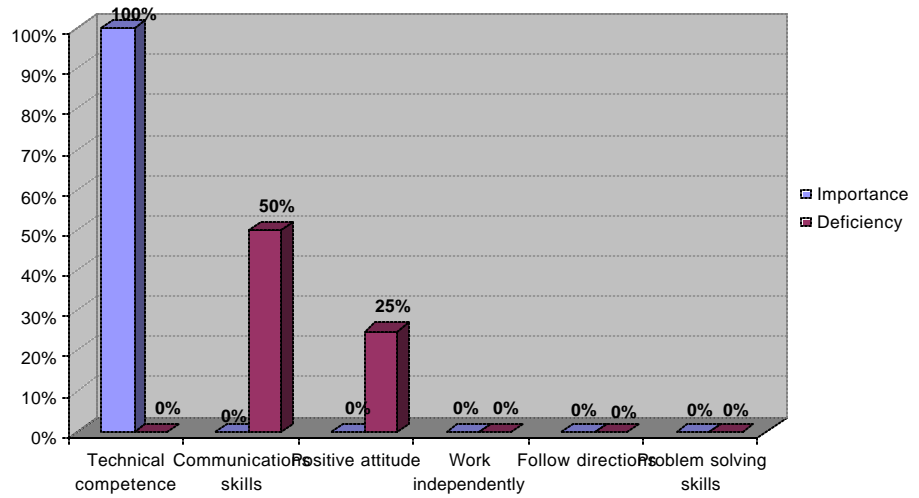


Figure 105. Engineering Technicians: Skill Importance and Deficiency

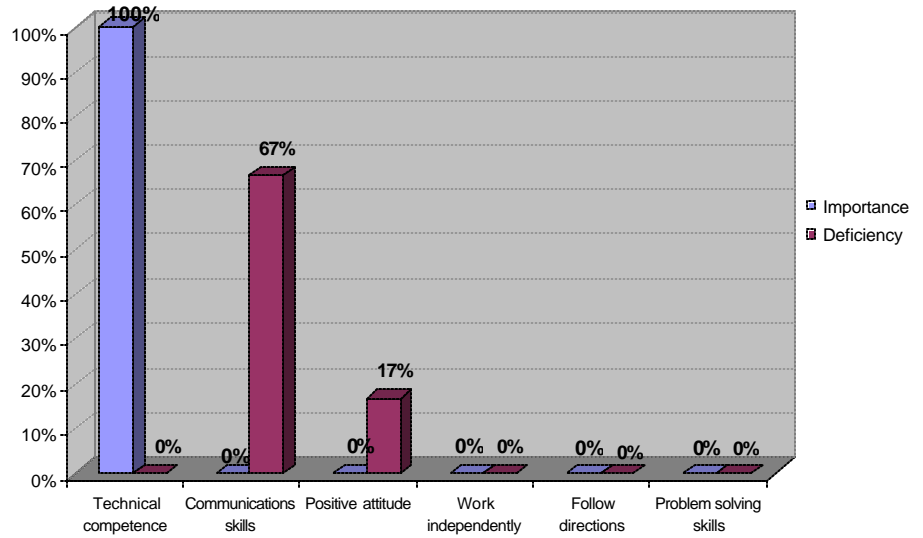


Figure 106. Electrical and Electronic Engineers: Skill Importance and Deficiency

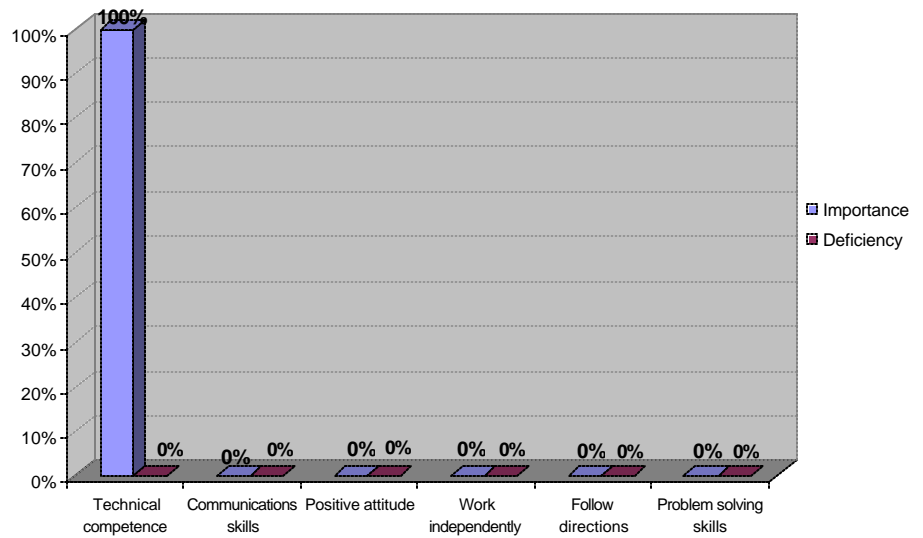


Figure 107. General Maintenance Repairers: Skill Importance and Deficiency

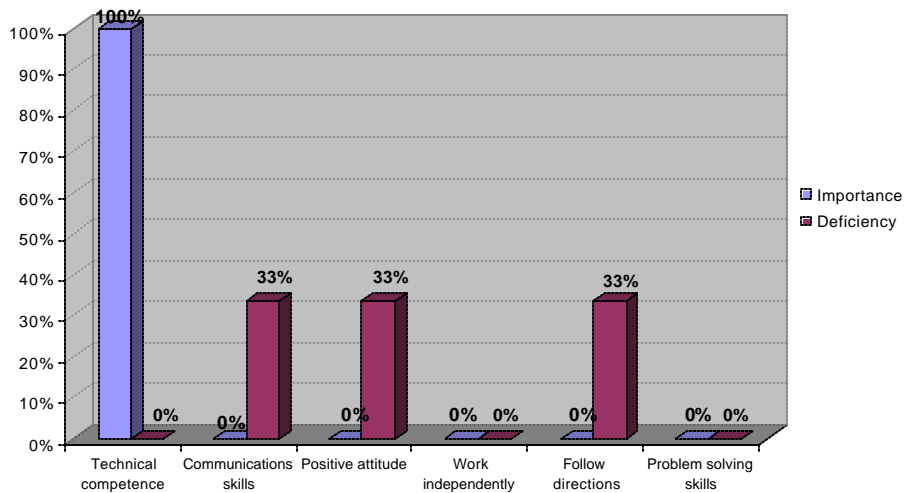


Figure 108. Computer Engineers and Programmers: Skill Importance and Deficiency

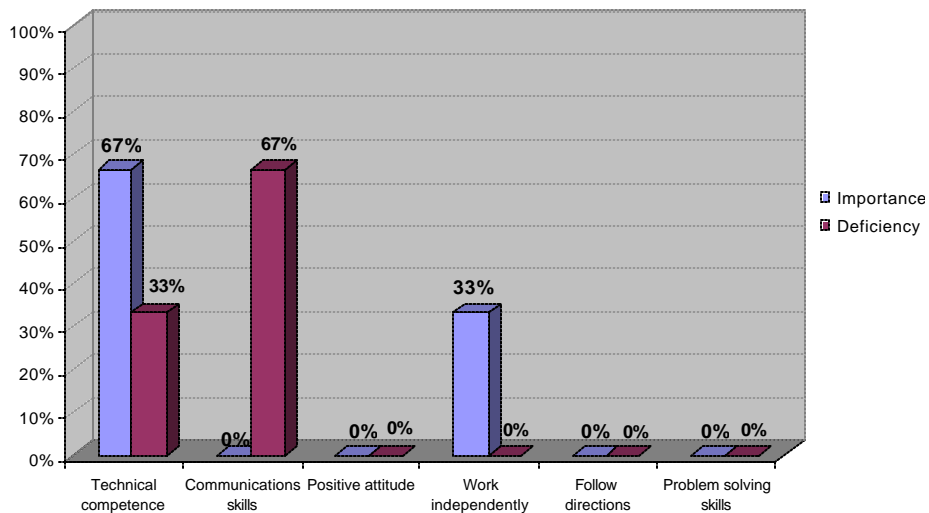
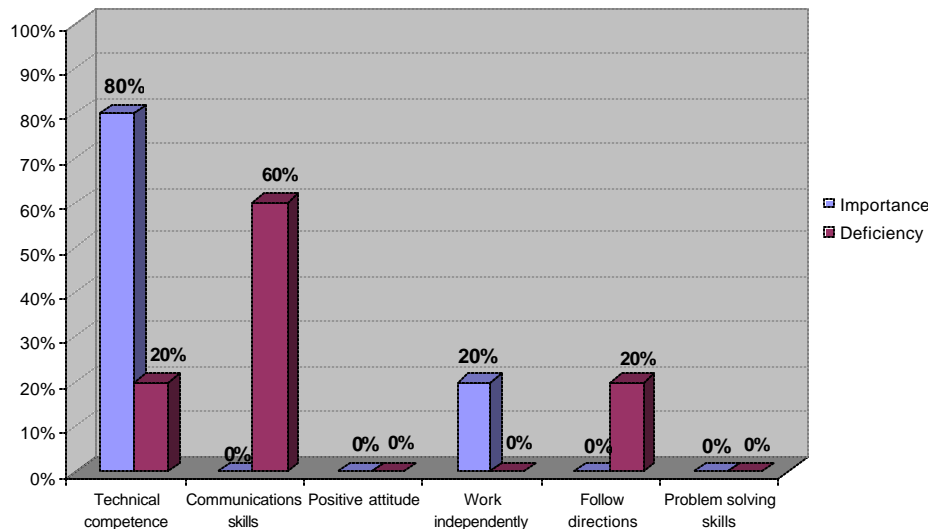


Figure 109. Inspectors and Testers: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, 15 to 40 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For COMM, every occupation except for 'Service Representatives' received less than ten responses for either entry-level or experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Electrical and Electronic Engineers had the highest median^{xxx} wage and mean^{xxxi} entry-level annual wage (\$47,000 for both) and Computer Engineers and Programmers had the highest median and mean experienced annual wage (\$49,920 and \$54,080, respectively) of the DnA occupations examined. Computer Engineers and Programmers were the only occupations in DnA to receive more than \$50,000 as the experienced mean wage.

Table 30. Defense and Aerospace Industry Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
General Machinists	Entry-Level	\$26,000	\$24,830	\$16,640	\$31,200
	Experienced	\$31,200	\$29,640	\$20,800	\$35,360
Sheet Metal Mechanics / Welders	Entry-Level	\$30,160	\$29,120	\$24,960	\$31,200
	Experienced	\$36,400	\$35,880	\$30,160	\$40,560
Assemblers and Fabricators	Entry-Level	\$19,760	\$21,667	\$16,640	\$29,120
	Experienced	\$28,340	\$28,513	\$24,960	\$33,280
Electrical and Electronic Assemblers	Entry-Level	\$28,500	\$28,500	\$28,500	\$28,500
	Experienced	\$43,000	\$43,000	\$43,000	\$43,000
Mechanical Engineers	Entry-Level	\$22,880	\$22,880	\$20,800	\$24,960
	Experienced	\$26,520	\$26,520	\$24,960	\$28,080
Engineering Technicians	Entry-Level	\$35,360	\$35,720	\$24,960	\$43,680
	Experienced	\$40,000	\$38,784	\$29,120	\$47,840
Electrical and Electronic Engineers	Entry-Level	\$47,000	\$47,000	\$47,000	\$47,000
	Experienced	\$49,000	\$49,000	\$49,000	\$49,000
General Maintenance Repairers	Entry-Level	\$30,160	\$28,427	\$16,640	\$35,360
	Experienced	\$33,280	\$30,160	\$20,800	\$39,520
Computer Engineers / Programmers	Entry-Level	\$45,760	\$49,227	\$39,520	\$62,400
	Experienced	\$49,920	\$54,080	\$43,680	\$68,640
Inspectors and Testers	Entry-Level	\$27,040	\$30,784	\$24,960	\$39,520
	Experienced	\$33,280	\$34,112	\$29,120	\$43,680

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Financial Managers, Accountants and Auditors, Employments Interviewers, Drafters / CAD, Systems Analysts, and Sales Agents, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Account Collectors, Accounting Clerks, Administrative Services Managers, Telemarketers and Solicitors, Paralegal Personnel, and Legal Secretaries, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xxx}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Accountants and Auditors the entry-level median wage of \$35,000 means that half of the *entry-level* wages given for Accountants and Auditors lie above \$35,000 and the other half of Accountants and Auditors *entry-level* wages lie below \$35,000.

^{xxxi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Energy and Environmental Services

The Energy and Environmental Services (EnE) is an emerging cluster that is primarily engaged in developing and manufacturing products with applications in energy distribution and environmental services.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 96 percent of DnA employees worked full-time, four percent worked part-time, and two percent were temporary employees (see Table 31). The current workforce of almost 13,000 employees is expected to decrease by 3 percent in the next 12 months^{xxxii}. The expected decline in industry employment represents almost 350 less jobs for Orange County.

Table 31. Industry Employment Practices^{xxxiii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
EnE	12,841	12,306 96%	535 4%	212 2%	-348 -3%

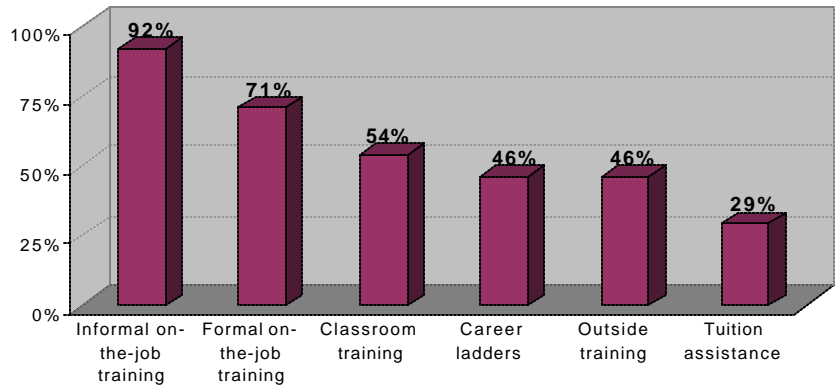
^{xxxii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xxxiii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 92 percent of EnE firms reported that they typically utilized informal on-the-job training at their business location, 63 percent used formal on-the-job training, 54 percent utilized in-house classroom training, 46 percent used career development or career ladders, 46 percent offered employer-paid outside training, and 29 percent of EnE firms offered employees tuition assistance at a college or university (see Figure110).

Figure 110. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately eight percent of EnE firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table32). In the last 12 months, approximately one in every 300 employees within the Energy and Environmental services industry was hired using an H-1B Visa (see Table33).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 32. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
32	383	8.33%

Table 33. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
42	12,841	0.33%

Energy and Environmental Services Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For the Energy and Environmental Services Cluster, the survey examined eight occupations: Environmental Microbiologists, Hazardous Waste Technicians, Environmental Analysts & Health Specialists, Refuse Collectors, Recycling Coordinators, Electric and Electronic Engineers, Industrial Engineers, and Instrumentation and Calibration Technicians. (See Appendix A for the definition used for each occupation within the survey.) Due to insufficient sample size, occupational data will not be presented for Environmental Microbiologists, Hazardous Waste Technicians, Recycling Coordinators, and Industrial Engineers.

Respondents were first asked whether their company employed individuals, at their business location, for any of the 8 occupations included in the EnE survey. Respondents were then asked detailed, occupation-specific questions for as many as six occupations that were randomly selected among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Electric and Electronic Engineers are expected to have the highest percentage turnover of the occupations examined (10%), whereas Instrumentation and Calibration Technicians and Refuse Collectors (5% and 6%, respectively) should have the lowest. Refuse Collectors had the highest 12-month rate of expected growth among EnE occupations, with a 19 percent growth rate over the next 12 months. Electric and Electronic Engineers and Instrumentation and Calibration Technicians (-5%) were the EnE occupations presented with negative expected growth rates for the next 12 months. Refuse Collectors will have the most openings in the next 12 months (189) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 34).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 34. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xxxiv}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Refuse Collectors	399	3%	6%	19%	189
Environmental & Health Analysts	136	1%	8%	0%	170
Electric and Electronic Engineers	1,160	9%	10%	-5%	139
Instrumentation / Calibration Technicians	234	2%	5%	-5%	15
Cluster Total	12,841	100%	7%	-3%	569

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

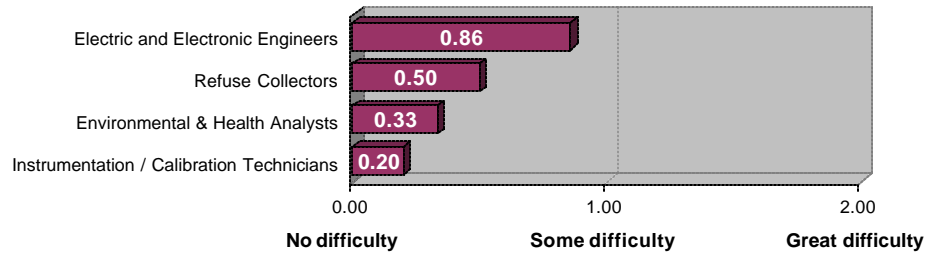
^{xxxiv}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 4 EnE occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. EnE firms had the most difficulty locating experienced Electric and Electronic Engineers (0.86) and Refuse Collectors (0.50).

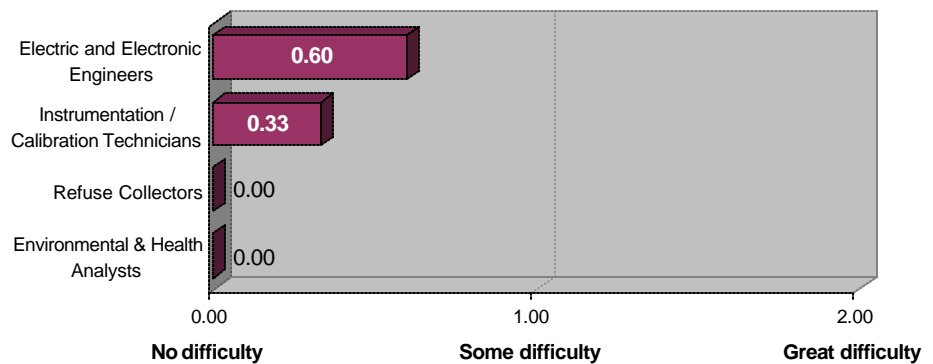
Figure 111. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Electric and Electronic Engineers (0.60), whereas firms did not have any difficulty finding non-experienced Refuse Collectors and Environmental Analysts & Health Specialists (0.00).

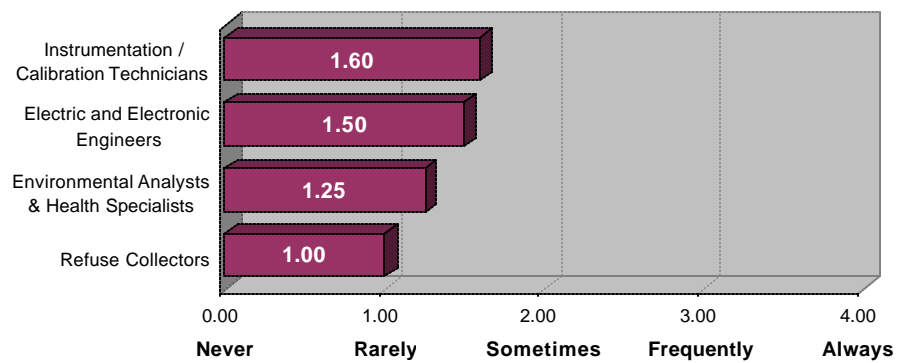
Figure 112. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Instrumentation and Calibration Technicians (1.60) was the occupation most often recruited from outside the County, followed by Electric and Electronic Engineers (1.50). It should be noted that for all four of the EnE occupations, firms ‘rarely’ to ‘sometimes’ recruited outside the County.

Figure 113. Recruitment Outside of Orange County

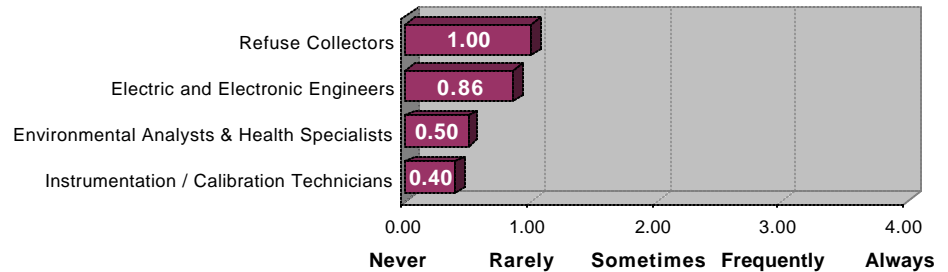


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Refuse Collectors in part-time positions with greater frequency than they did any other EnE occupation, but even so, their frequency of hiring part-time Refuse Collectors still only averaged 'rarely' (1.00). For all four of the EnE occupations presented, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure 114).

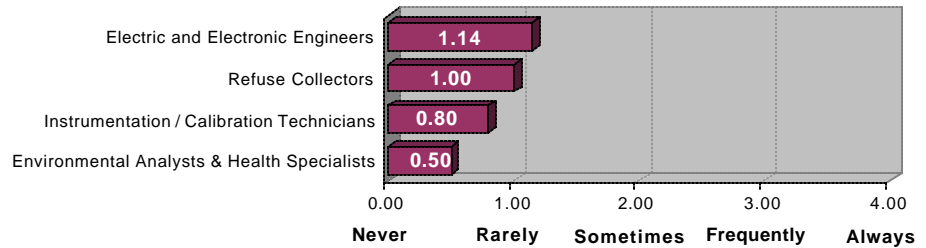
Figure 114. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Electric and Electronic Engineers(1.14) was the occupation where temporary employees were most frequently hired, followed by Refuse Collectors (1.00). It should be noted that the frequency of hiring temporary workers for three of the four EnE occupations ranged between ‘never’ and ‘rarely’, with firms hiring temporary Environmental Analysts & Health Specialists (0.50) with the lowest frequency (see Figure 115).

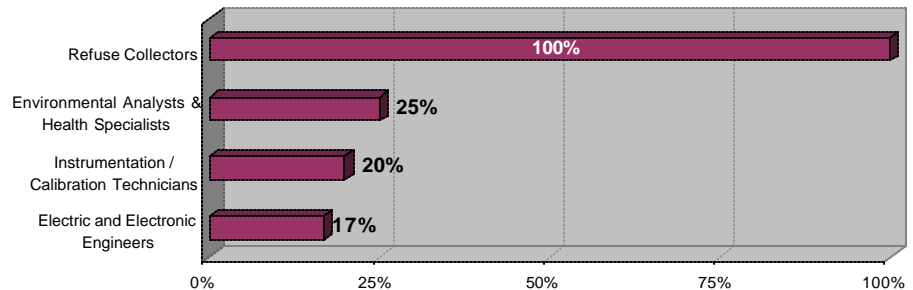
Figure 115. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the four EnE occupations. One hundred percent of firms hired non-English speaking Refuse Collectors. On the other end of the spectrum, 17 percent of the firms hired non-English speaking Electric and Electronic Engineers.

Figure 116. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Energy and Environmental Services survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

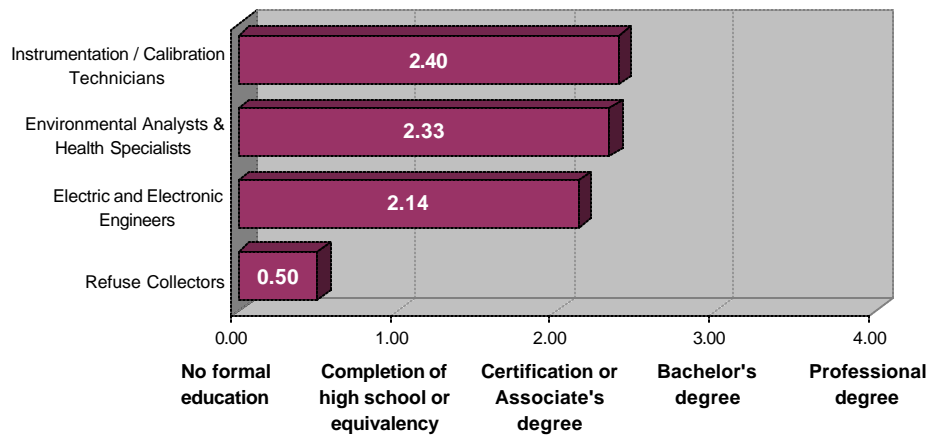
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the 4 EnE occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where ‘Professional degree’ = +4, ‘Bachelor’s degree’ = +3, ‘Certification or Associate’s degree’ = +2, ‘completion of high school or equivalency’ = +1, and ‘no formal education requirements’ = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least ‘Certification or an Associate’s degree’.

Instrumentation and Calibration Technicians had the highest average education requirement (2.40). Refuse Collectors had the lowest average educational requirements (0.50). For three of the four positions presented, respondents indicated that at least a Certificate or Associate’s degree was the average education level of successful applicants (see Figure 117).

Figure 117. Mean Education Requirements by Occupation

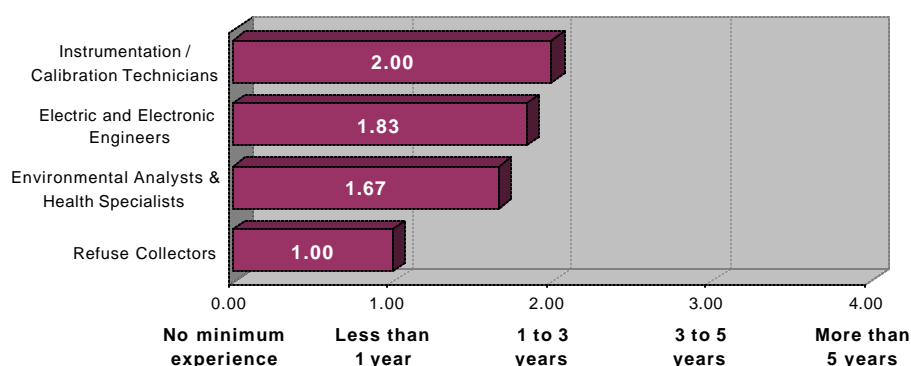


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to the next question were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Instrumentation and Calibration Technicians had the highest average experience requirement (2.00) of the 4 occupations presented, followed by Electric and Electronic Engineers (1.83). On the opposite end of the spectrum, Refuse Collectors had the lowest average experience requirements (1.00) for applicants’ success (see Figure 118).

Figure 118. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each EnE occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: ‘Technical competence specific to the position’, ‘Interpersonal and communication skills’, ‘Conscientious and maintains a positive attitude’, ‘Able to work independently’, ‘Able to follow directions’, and ‘Creative problem solving skills’.

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Half of the responding EnE firms felt the ability to work independently was the most important skill for Refuse Collectors with the other half mentioning the ability to follow directions as the most important skill for the position. The most noted deficiencies for current Refuse Collectors were split in half again between communication skills and the ability to follow directions. Figures 119 through 122 display skill importance and deficiency by each occupation.

Figure 119. Environmental Analysts and Health Specialists - Skill Importance and Deficiency

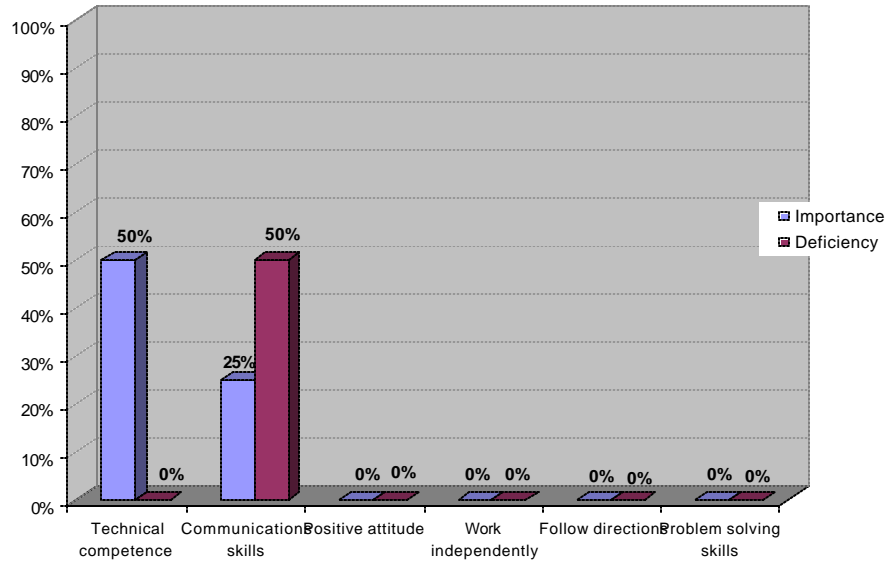


Figure 120. Refuse Collectors: Skill Importance and Deficiency

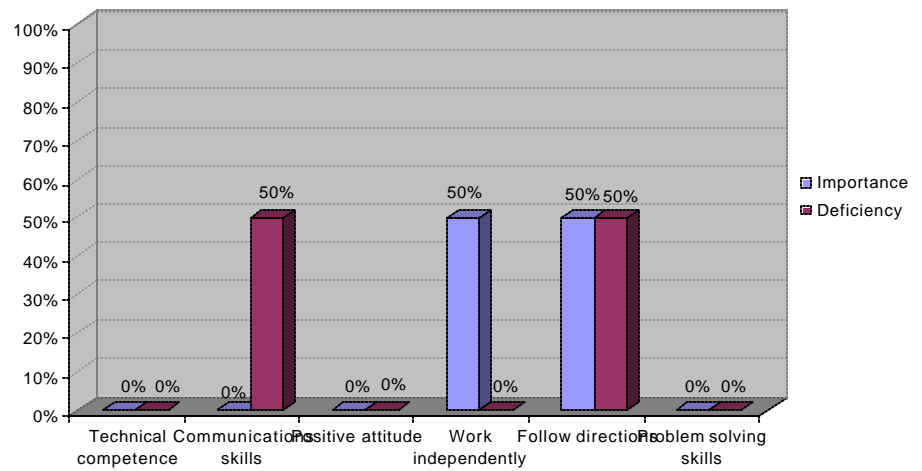


Figure 121. Electrical and Electronic Engineers: Skill Importance and Deficiency

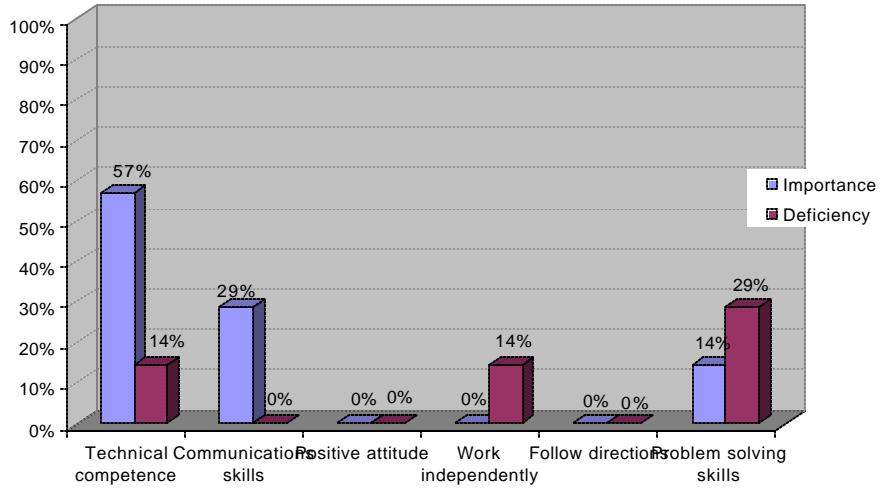
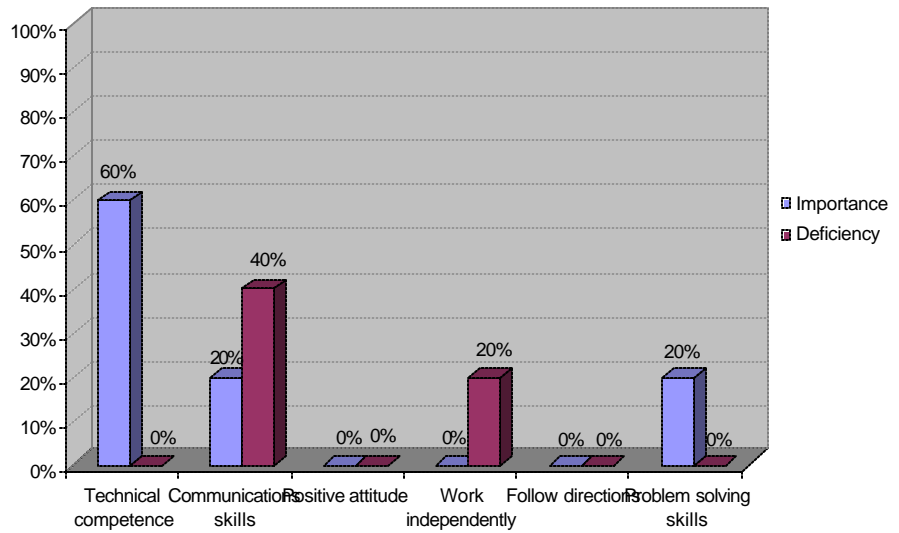


Figure 122. Instrumentation and Calibration Technicians: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, 25 to 50 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For EnE, every occupation received less than ten responses for either entry-level or experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in the EnE occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Instrumentation and Calibration Technicians had the highest median^{xxxv} wage and mean^{xxxvi} entry-level annual wage (\$43,680 and \$41,240, respectively) as well as the highest median and mean experienced annual wage (\$47,840 and \$46,887, respectively) of the EnE occupations examined. None of the EnE occupations presented received as much as \$50,000 as the experienced median wage.

Table 35. Energy and Environmental Services Industry Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Environmental Analysts & Health Specialists	Entry-Level	\$30,940	\$30,030	\$27,040	\$31,200
	Experienced	\$36,400	\$36,400	\$33,280	\$39,520
Refuse Collectors	Entry-Level	\$16,640	\$16,640	\$16,640	\$16,640
	Experienced	\$20,800	\$20,800	\$20,800	\$20,800
Electric and Electronic Engineers	Entry-Level	\$40,000	\$38,013	\$27,040	\$47,000
	Experienced	\$42,000	\$41,733	\$31,200	\$52,000
Instrumentation / Calibration Technicians	Entry-Level	\$43,680	\$41,240	\$27,040	\$53,000
	Experienced	\$47,840	\$46,687	\$31,221	\$61,000

The wage data presented here was filtered by taking out the extreme highs and lows for each occupation. For Instrumentation and Calibration Technicians, Environmental Analysts and Health Specialists, and Electric and Electronic Engineers, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Refuse Collectors, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xxxv}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Electric and Electronic Engineers the entry-level median wage of \$40,000 means that half of the *entry-level* wages given for Electric and Electronic Engineers lie above \$40,000 and the other half of Electric and Electronic Engineers *entry-level* wages lie below \$40,000.

^{xxxvi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Health Services

The Health Services (HSVC) cluster is made up of firms that provide medical and health-related services to the public through hospitals and other medical facilities.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 84 percent of HSVC employees worked full-time, 16 percent worked part-time, and five percent were temporary employees (see Table 36). The current workforce of more than 75,000 employees is expected to increase by one percent in the next 12 months^{xxxvii}. The expected increase in industry employment represents approximately 400 new jobs for Orange County.

Table 36. Industry Employment Practices^{xxxviii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
HSVC	75,403	62,966 84%	12,437 16%	3,901 5%	394 1%

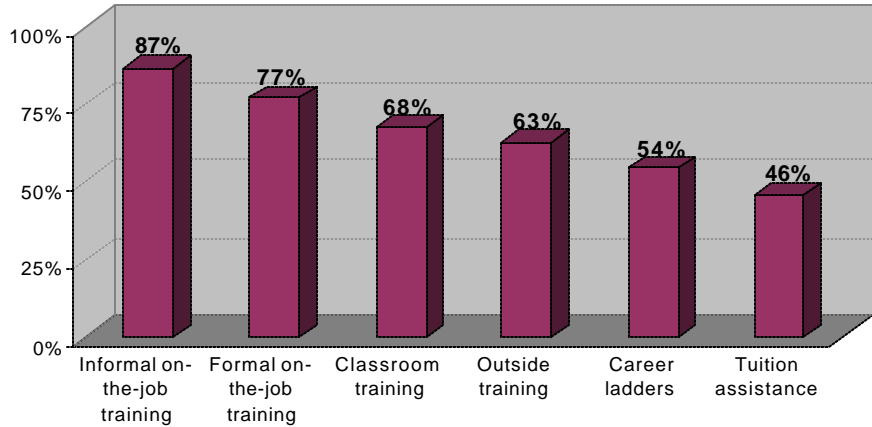
^{xxxvii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xxxviii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 87 percent of firms reported that they typically utilized informal on-the-job training at their business location, 77 percent used formal on-the-job training, 68 percent utilized in-house classroom training, 63 percent offered employer-paid outside training, 54 percent used career development or career ladders, and 46 percent offered employees tuition assistance at a college or university (see Figure123).

Figure 123. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 15 percent of Health Services firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table37). In the last 12 months, approximately one in every 333 employees within Health Services was hired using an H-1B Visa (see Table38).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 37. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
877	5,862	14.96%

Table 38. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
226	75,403	0.30%

Health Services Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For Health Services, the survey examined ten occupations: Registered Nurse, Certified Nursing Aides, Licensed Vocational Nurses, Radiology Technologists, Physical Therapy Assistants, Certified Home Health Aides, Non-Certified Home Health Aides, Medical Assistants, Occupational Therapists, and Paramedics. Due to insufficient sample size, occupational data will not be presented for Paramedics. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the ten occupations included in the HSVC survey. Respondents were then asked detailed, occupation-specific questions about six occupations that were randomly selected from among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Licensed Vocational Nurses and Non-Certified Home Health Aides are expected to have the highest percentage turnover of the occupations examined (17%), whereas Radiology Technologists (1%) and Medical Assistants (2%) should have the lowest. Physical Therapy Assistants and Licensed Vocational Nurses had the highest 12-month rate of expected growth among HSVC occupations, with 11 percent and seven percent, respectively. Medical Assistants (-7%), Certified Nursing Aides (-5%), and Occupational Therapists (-1%) each had a negative expected growth rate over the next 12 months. Certified Nursing Aides will have the most openings in the next 12 months (789) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 39).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 39. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xxxix}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Certified Nursing Aides	8,134	10.8%	14%	-5%	789
Licensed Vocational Nurses	2,894	3.8%	17%	7%	701
Registered Nurses	10,993	14.6%	3%	0%	344
Non-Certified Home Health Aides	1,304	1.7%	17%	0%	217
Physical Therapy Assistants	809	1.1%	7%	11%	147
Certified Home Health Aides	1,201	1.6%	5%	2%	92
Occupational Therapists	778	1.0%	6%	-1%	43
Radiology Technologists	744	1.0%	1%	1%	19
Medical Assistants	555	0.7%	2%	-7%	-30
Cluster Total	75,403	100%	9%	1%	6,998

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

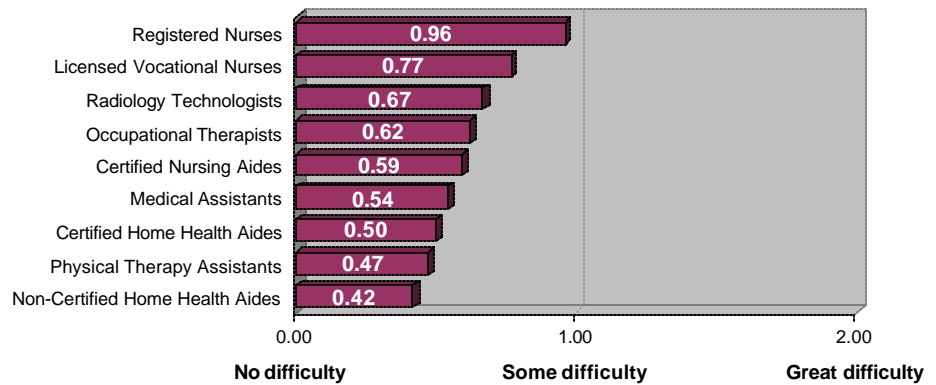
^{xxxix}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had ‘great difficulty’, ‘some difficulty’, or ‘no difficulty’ finding experienced and non-experienced applicants, respectively, for each of the nine HSVC occupations. Responses to these questions were coded according to a difficulty scale where ‘great difficulty’ = +2, ‘some difficulty’ = +1, and ‘no difficulty’ = 0. A score of 1.00 would indicate that, on average, firms had ‘some difficulty’ finding experienced applicants. HSVC firms had the most difficulty locating experienced Registered Nurses (0.96), followed by Licensed Vocational Nurses (0.77), Radiology Technologists (0.77), and Occupational Therapists (0.62).

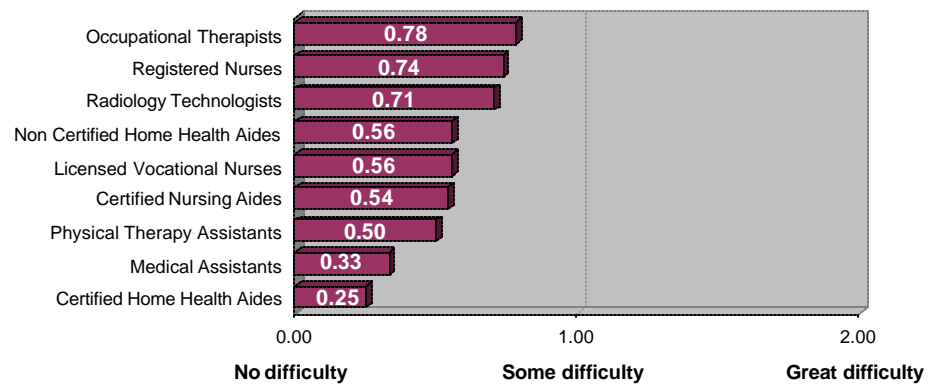
Figure 124. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Occupational Therapists (0.78), Registered Nurses (0.74), and Radiology Technologists (0.71), whereas firms had a low level of difficulty finding non-experienced Certified Home Health Aides (0.25).

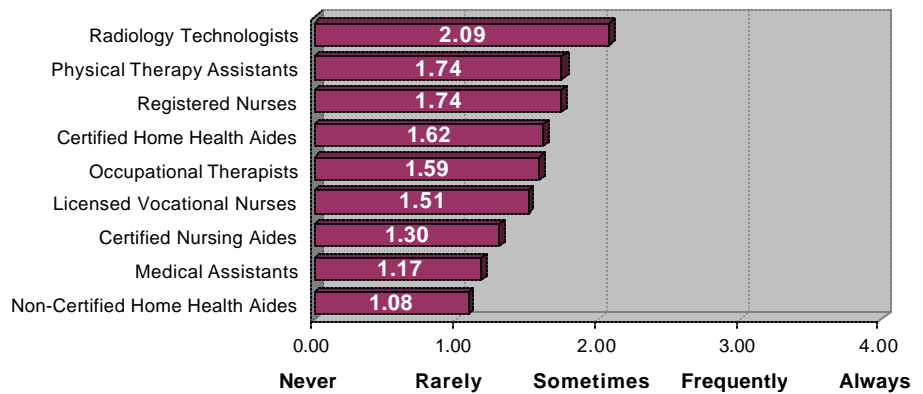
Figure 125. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Radiology Technologists (2.09) was the occupation most often recruited from outside the County, followed by Physical Therapy Assistants (1.74), Registered Nurses (1.74), and Certified Home Health Aides (1.62). It should be noted that for nine of the ten occupations, firms ‘rarely’ to ‘sometimes’ recruited outside the County.

Figure 126. Recruitment Outside of Orange County

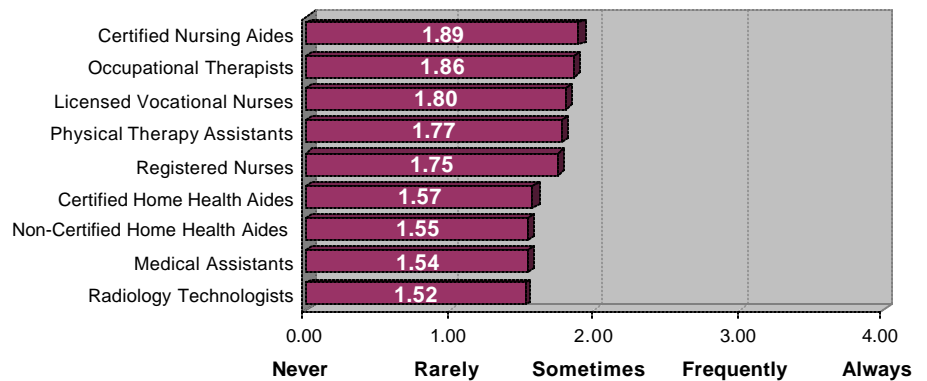


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Certified Nursing Aides in part-time positions with greater frequency than they did any other HSVC occupation, but even so, their frequency of hiring part-time Certified Nursing Aides still only averaged 'sometimes' (1.89). For each of the nine occupations surveyed, firms indicated that, on average, they 'rarely' to 'sometimes' hired individuals part-time (see Figure 127).

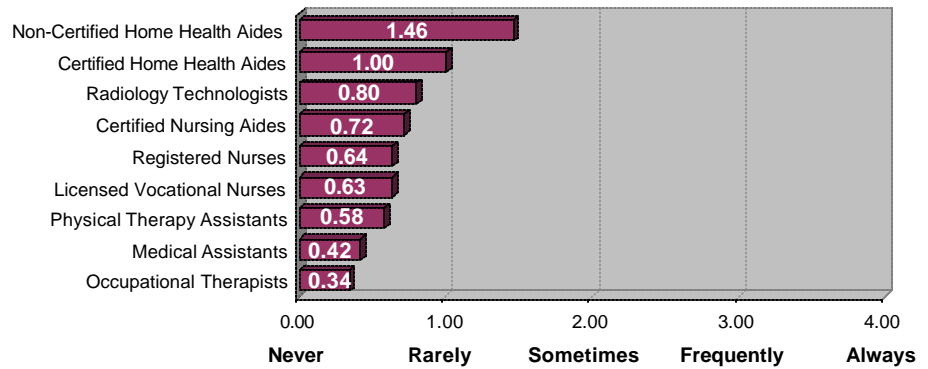
Figure 127. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Non-Certified Home Health Aides (1.46) was the occupation where temporary employees were most frequently hired, followed by Certified Home Health Aides (1.00) and Radiology Technologists (0.80). It should be noted that the frequency of hiring temporary workers for seven of the nine HSVC occupations ranged between 'never' and 'rarely', with firms hiring temporary Occupational Therapists (0.34) with the lowest frequency (see Figure 128).

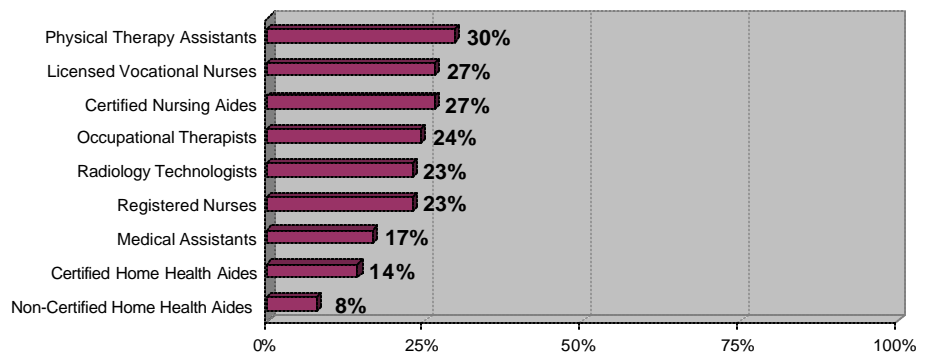
Figure 128. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the nine HSVC occupations. Thirty percent of firms hired non-English speaking Physical Therapy Assistants, followed by Licensed Vocational Nurses (27%), Certified Nursing Aides (27%), and Occupational Therapists (24%).

Figure 129. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Health Services survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

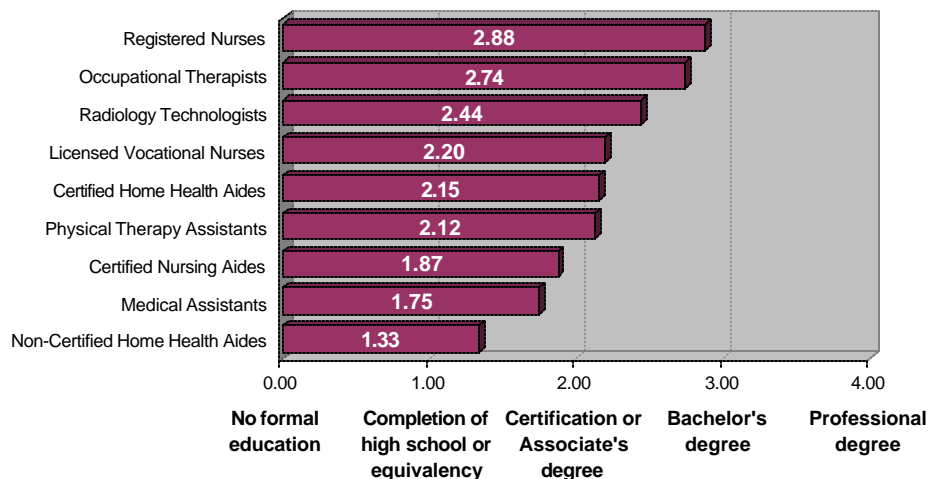
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the nine HSVC occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where 'Professional degree' = +4, 'Bachelor's degree' = +3, 'Certification or Associate's degree' = +2, 'completion of high school or equivalency' = +1, and 'no formal education requirements' = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least 'Certification or an Associate's degree'.

Registered Nurses had the highest average education requirement (2.88), with most respondents agreeing the position required a Bachelor's degree. Non-Certified Home Health Aides had the lowest average educational requirements (1.33), with respondents indicating that applicants needed, on average, slightly more than completion of high school or its equivalent to be successful. For six of the nine positions examined, respondents indicated that at least a Certificate or Associate's degree was the average education level of successful applicants (see Figure 130).

Figure 130. Mean Education Requirements by Occupation

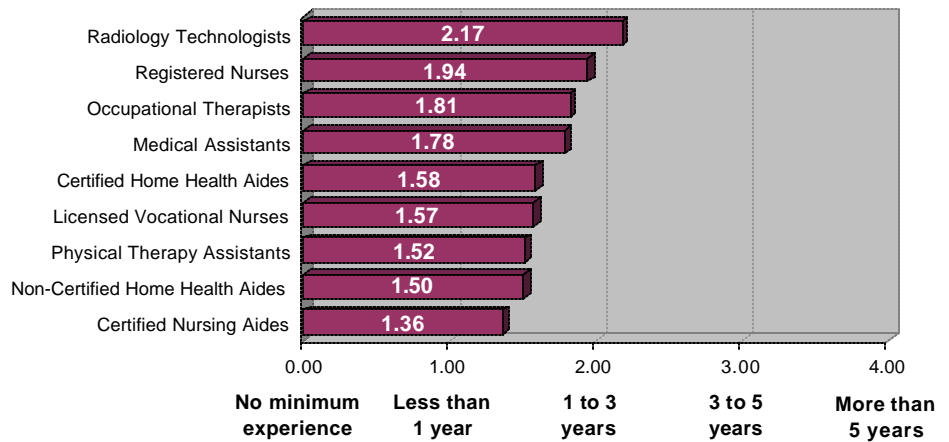


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to Question 19 were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Radiology Technologists had the highest average experience requirement (2.17) of the nine occupations examined, followed by Registered Nurses (1.94), Occupational Therapists (1.81), and Medical Assistants (1.78). On the opposite end of the spectrum, Certified Nursing Aides had the lowest average experience requirements (1.36) for applicants’ success (see Figure 131).

Figure 131. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each HSVC occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

Seventy-eight percent of firms felt technical competence specific to the position was the most important skill for Radiology Technologists and only 19 percent of firms felt that their employees were currently deficient in this skill. For Non-Certified Home Health Aides, 54 percent of firms felt that interpersonal and communication skills were the most important and 15 percent of firms noted that employees were deficient in communication skills. Figures 132 through 140 display skill importance and deficiency by each occupation.

Figure 132. Registered Nurses: Skill Importance and Deficiency

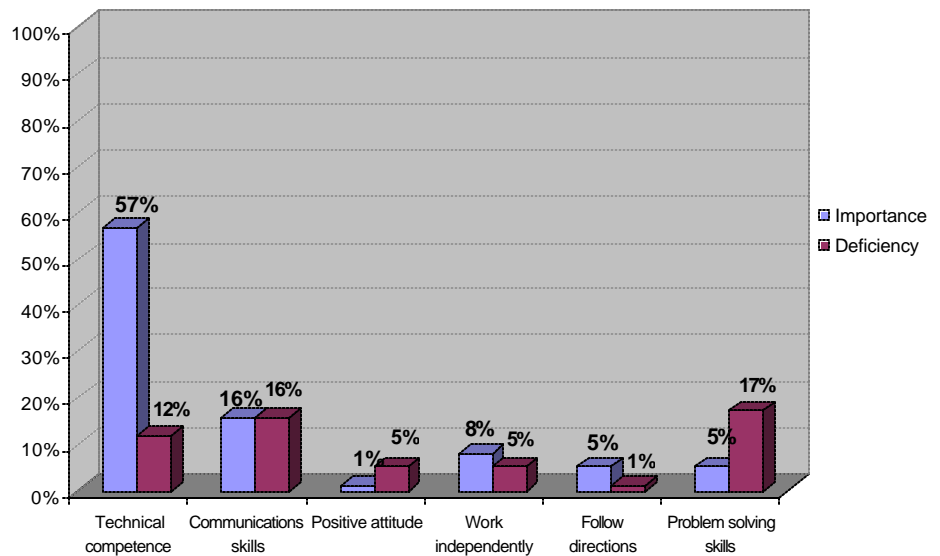


Figure 133. Certified Nursing Aides: Skill Importance and Deficiency

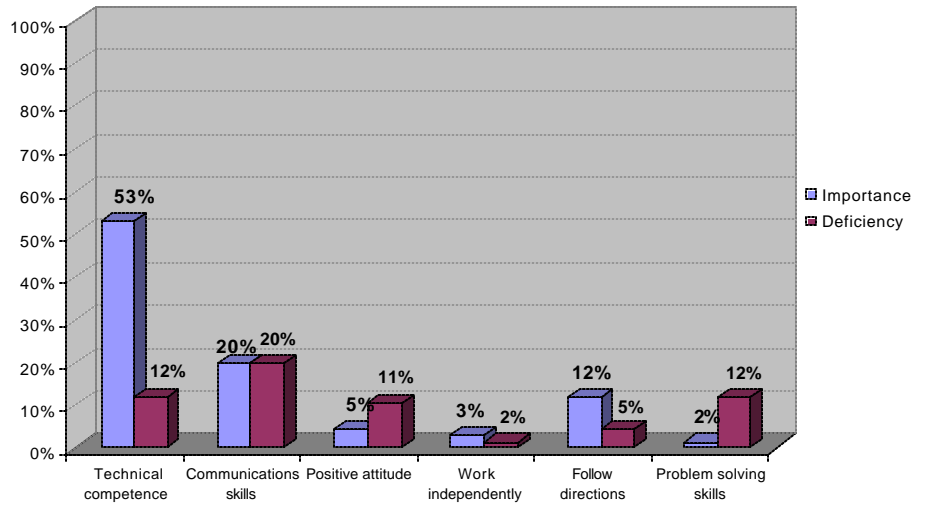


Figure 134. Licensed Vocational Nurses: Skill Importance and Deficiency

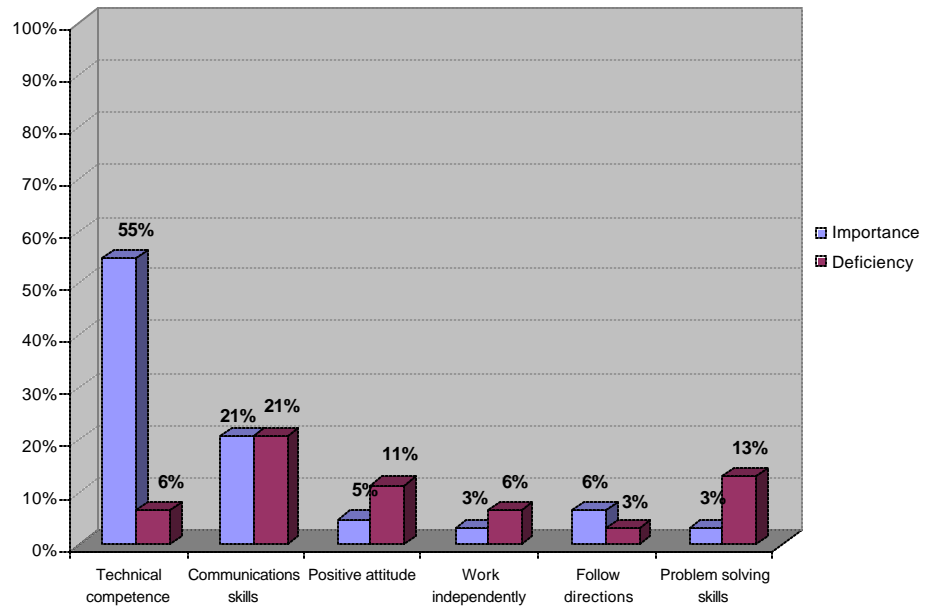


Figure 135. Radiology Technologists: Skill Importance and Deficiency

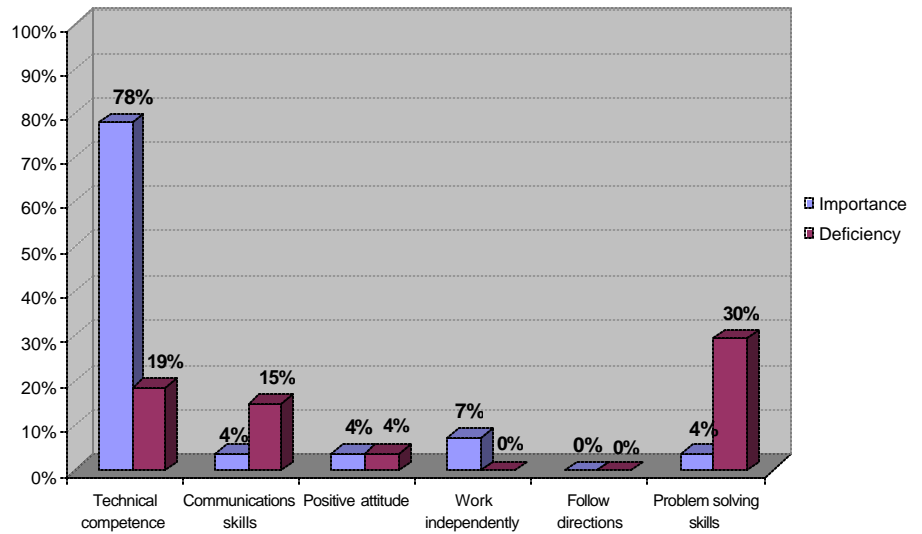


Figure 136. Physical Therapy Assistants: Skill Importance and Deficiency

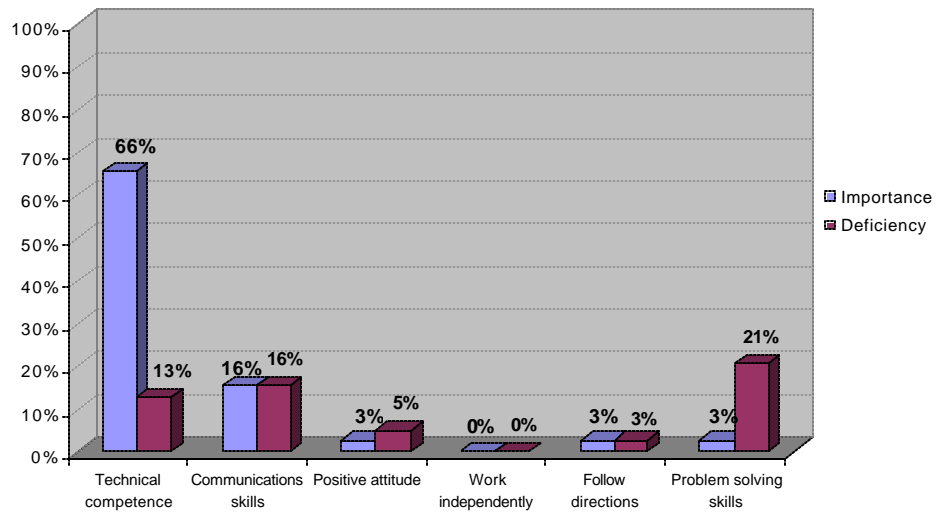


Figure 137. Certified Home Health Aides: Skill Importance and Deficiency

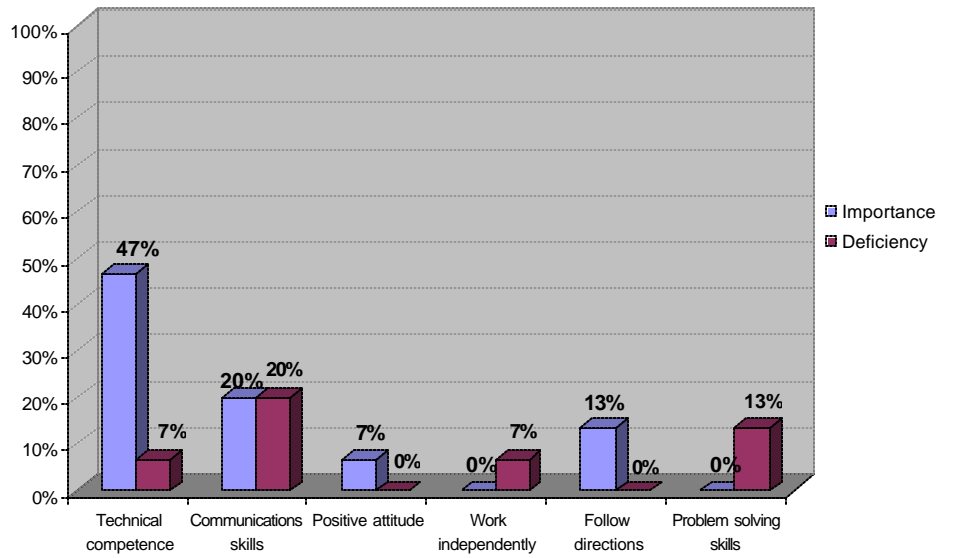


Figure 138. Non-Certified Home Health Aides: Skill Importance and Deficiency

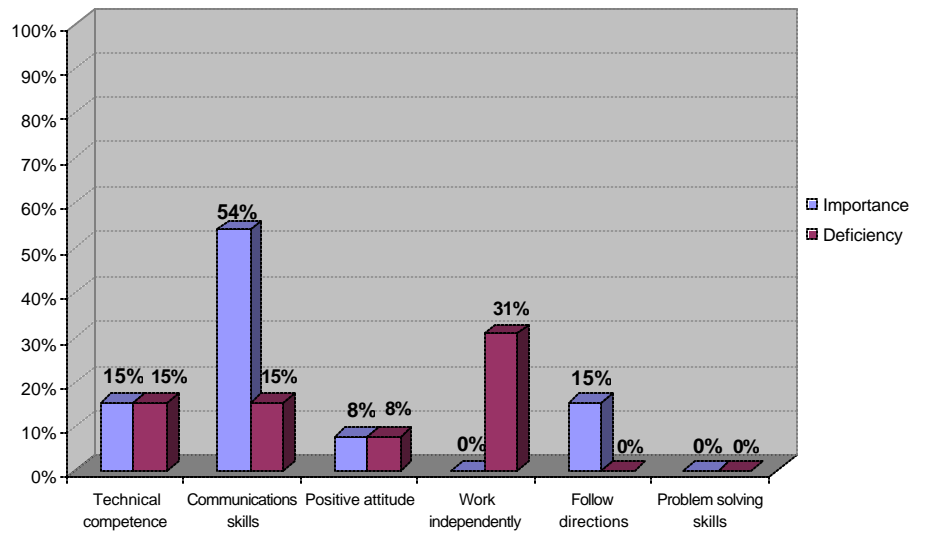


Figure 139. Medical Assistants: Skill Importance and Deficiency

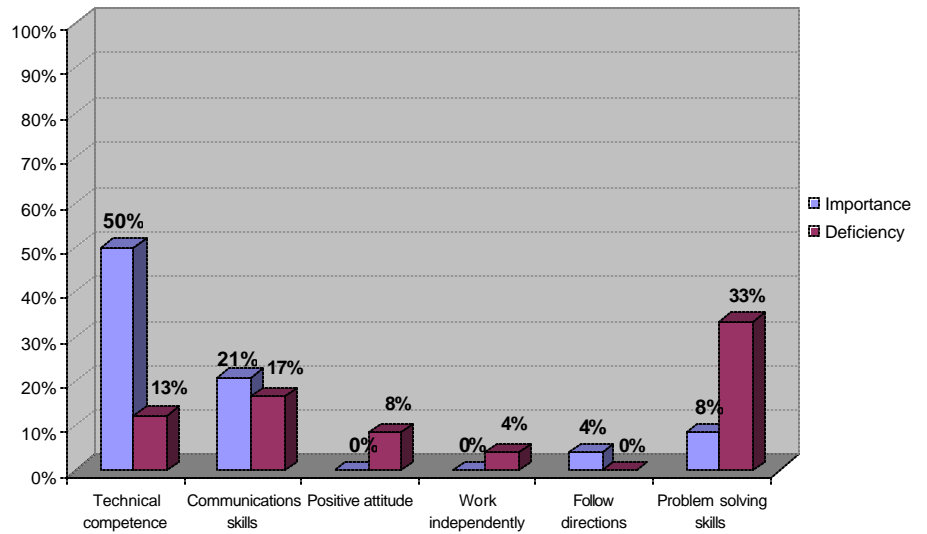
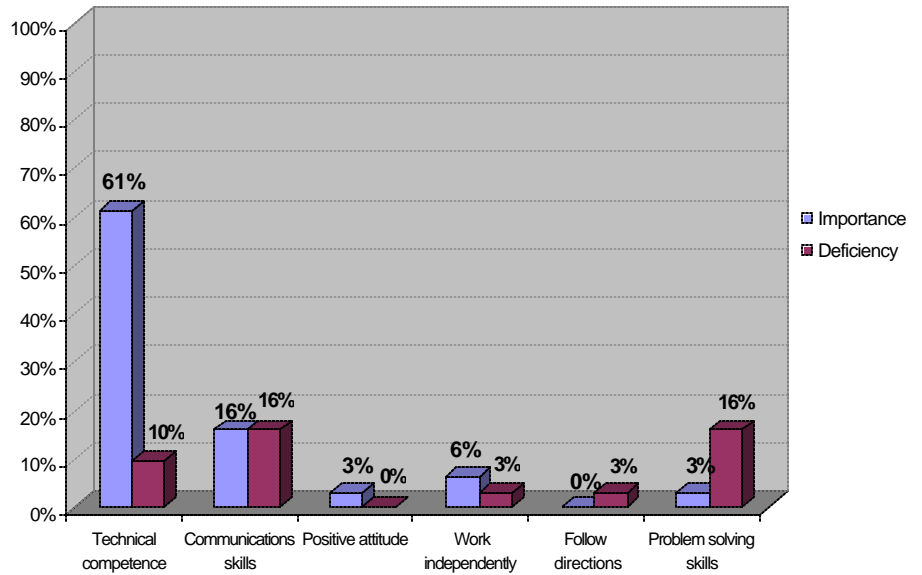


Figure 140. Occupational Therapists: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, 10 to 35 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For HSVC, Certified Home Health Aides and Non-Certified Home Health Aides received less than ten responses for both entry-level and experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Registered Nurses had the highest median^{xl} and mean^{xli} entry-level annual wage (\$45,760 and \$44,580, respectively) as well as the highest median and mean experienced annual wage (\$52,000 and \$50,625, respectively) of the HSVC occupations examined. Radiology Technologists, along with Registered Nurses, were the only occupations in HSVC to receive more than \$40,000 as the experienced median wage.

Table 40. Health Services Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Registered Nurses	Entry-Level	\$45,760	\$44,580	\$18,720	\$75,000
	Experienced	\$52,000	\$50,625	\$22,880	\$78,000
Certified Nursing Aides	Entry-Level	\$18,928	\$20,727	\$14,560	\$41,600
	Experienced	\$21,216	\$23,127	\$16,432	\$43,680
Licensed Vocational Nurses	Entry-Level	\$33,280	\$32,805	\$14,560	\$49,920
	Experienced	\$35,360	\$35,992	\$19,760	\$56,160
Radiology Technologists	Entry-Level	\$36,400	\$33,878	\$20,000	\$49,400
	Experienced	\$40,560	\$41,293	\$25,000	\$54,000
Physical Therapy Assistants	Entry-Level	\$31,200	\$33,540	\$15,000	\$66,560
	Experienced	\$35,360	\$38,273	\$16,640	\$72,800
Certified Home Health Aides	Entry-Level	\$33,800	\$31,720	\$22,880	\$37,440
	Experienced	\$35,464	\$34,008	\$24,960	\$38,480
Non-Certified Home Health Aides	Entry-Level	\$18,720	\$20,020	\$16,640	\$31,200
	Experienced	\$19,760	\$21,348	\$16,640	\$31,200
Medical Assistants	Entry-Level	\$22,880	\$23,395	\$15,000	\$35,360
	Experienced	\$29,120	\$28,983	\$15,000	\$43,680
Occupational Therapists	Entry-Level	\$35,360	\$41,205	\$27,040	\$66,560
	Experienced	\$39,520	\$44,379	\$31,200	\$70,720

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Registered Nurses and Radiology Technologists, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Certified Nursing Aides, Licensed Vocational Nurses, Physical Therapy Assistants, Certified Home Health Aides, Non-Certified Home Health Aides, Medical Assistants, Occupational Therapists, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xl}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Registered Nurses the entry-level median wage of \$45,760 means that half of the *entry-level* wages given for Registered Nurses lie above \$45,760 and the other half of Registered Nurses *entry-level* wages lie below \$45,760.

^{xli}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Professional & Business Services

The Professional and Business Services (PFSV) cluster is made up of firms that provide a wide array of professional services *to the business community including management, legal, architectural, and personnel supply services*. The PFSV cluster within Orange County plays a dynamic and vital role in the regional economy.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 90 percent of PFSV employees worked full-time, ten percent worked part-time, and two percent were temporary employees (see Table 41). The current workforce of almost 138,000 employees is expected to increase by two percent in the next 12 months^{xlii}. The expected increase in industry employment represents over 2,000 new jobs for Orange County.

Table 41. Industry Employment Practices^{xliii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
PFSV	137,922	124,494 90%	13,428 10%	2,441 2%	2,080 2%

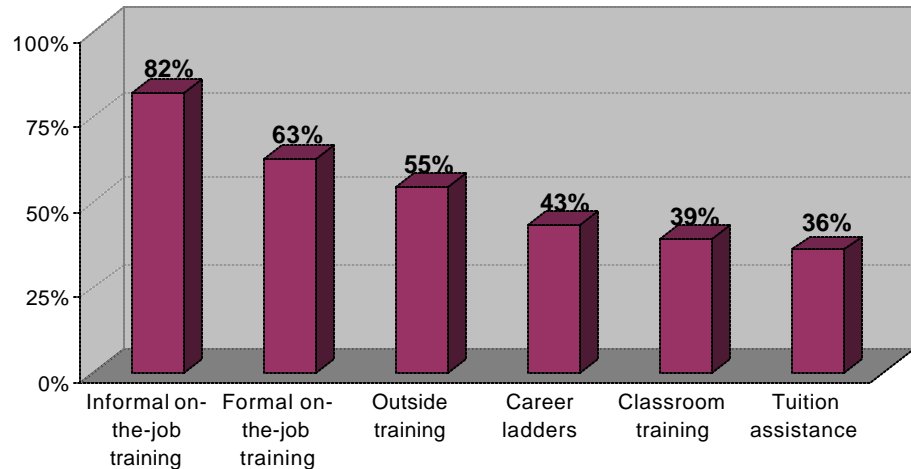
^{xlii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xliii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 82 percent of firms reported that they typically utilized informal on-the-job training at their business location, 63 percent used formal on-the-job training, 55 percent offered employer-paid outside training, 43 percent used career development or career ladders, 39 percent utilized in-house classroom training, and 36 percent offered employees tuition assistance at a college or university (see Figure 141).

Figure 141. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 12 percent of Professional and Business Services firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table 42). In the last 12 months, approximately one in every 120 employees within Professional and Business Services was hired using an H-1B Visa (see Table 43).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 42. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
1,173	9,461	12.40%

Table 43. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
1,156	137,922	0.84%

Professional and Business Services Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For Professional and Business Services, the survey examined 12 occupations: Financial Managers, Accountants and Auditors, Account Collectors, Accounting Clerks, Administrative Services Managers, Employment Interviewers, Drafters / Computer Assisted Drafters, Systems Analysts, Sales Agents, Telemarketers and Solicitors, Paralegal Personnel, Legal Secretaries. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the 12 occupations included in the PFSV survey. Respondents were then asked detailed, occupation-specific questions about six occupations that were randomly selected from among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Telemarketers and Solicitors and Paralegal Personnel are expected to have the highest percentage turnover of the occupations examined (35% and 25%, respectively), whereas Employment Interviewers (3%) and Account Collectors (5%) should have the lowest. Telemarketers and Solicitors and Systems Analysts had the highest 12-month rate of expected growth among PFSV occupations, with 26 percent and 22 percent, respectively. Accounting Clerks (-5%) was the only occupation with negative expected growth over the next 12 months. Sale Agents will have the most openings in the next 12 months (752) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table 44).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 44. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xliv}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Sales Agents	5,720	4.1%	7%	6%	752
Administrative Managers	1,302	0.9%	10%	16%	337
Systems Analysts	1,086	0.8%	8%	22%	320
Financial Managers	1,179	0.9%	15%	11%	309
Telemarketers and Solicitors	493	0.4%	35%	26%	300
Legal Secretaries	1,481	1.1%	13%	6%	286
Accountants and Auditors	1,596	1.2%	14%	4%	274
Drafters / CAD	844	0.6%	9%	19%	233
Employment Interviewers	2,019	1.5%	3%	7%	209
Paralegal Personnel	463	0.3%	25%	17%	193
Accounting Clerks	1,135	0.8%	17%	-5%	139
Account Collectors	948	0.7%	5%	6%	109
Cluster Total	137,922	100%	11%	2%	17,822

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

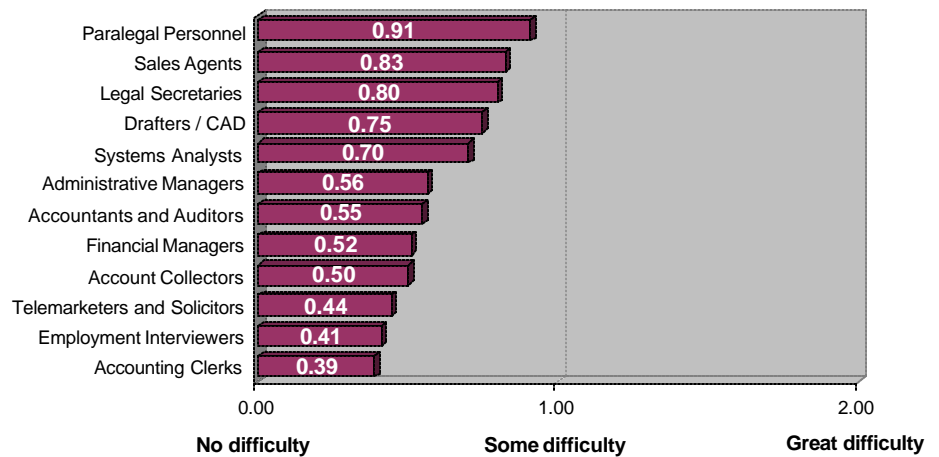
^{xliv}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 12 PFSV occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. PFSV firms had the most difficulty locating experienced Paralegal Personnel (0.91), Sales Agents (0.83), Legal Secretaries (0.80), Drafters / Computer Assisted Drafters (0.75), and Systems Analysts (0.70).

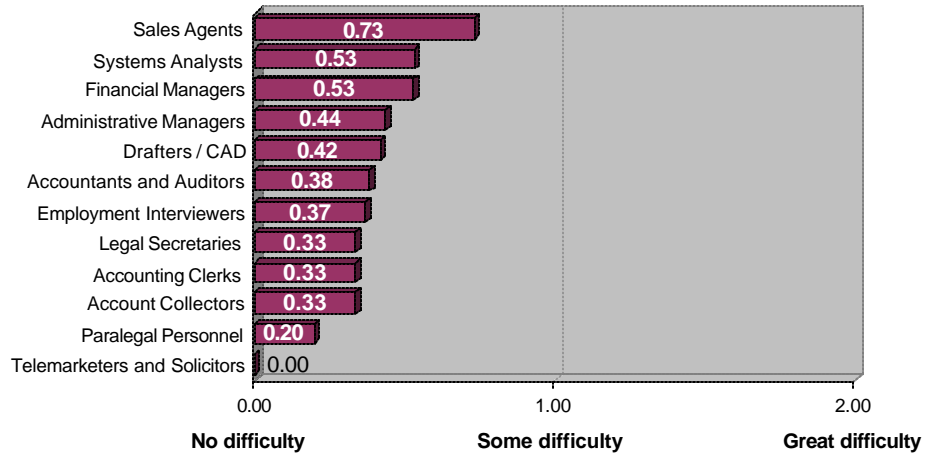
Figure 142. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Sales Agents (0.73), Systems Analysts (0.53), and Financial Managers (0.53), whereas firms did not have any difficulty finding non-experienced Telemarketers and Solicitors (0.00).

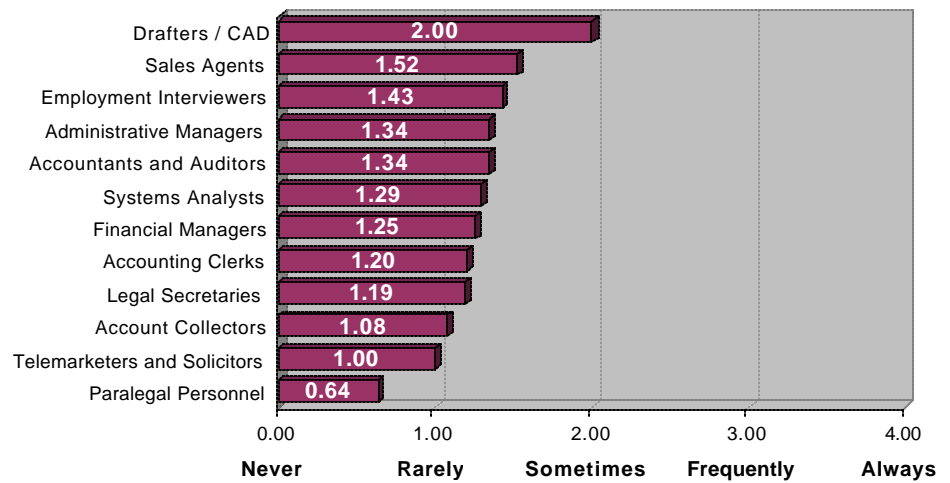
Figure 143. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they 'always', 'frequently', 'sometimes', 'rarely', or 'never' recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' recruited outside Orange County for a given occupation. On average, Drafters / Computer Assisted Drafters (2.00) was the occupation most often recruited from outside the County, followed by Sales Agents (1.52), Employment Interviewers (1.43), Administrative Services Managers (1.34), and Accountants and Auditors (1.34). It should be noted that for 11 of the 12 occupations, firms 'rarely' to 'sometimes' recruited outside the County.

Figure 144. Recruitment Outside of Orange County

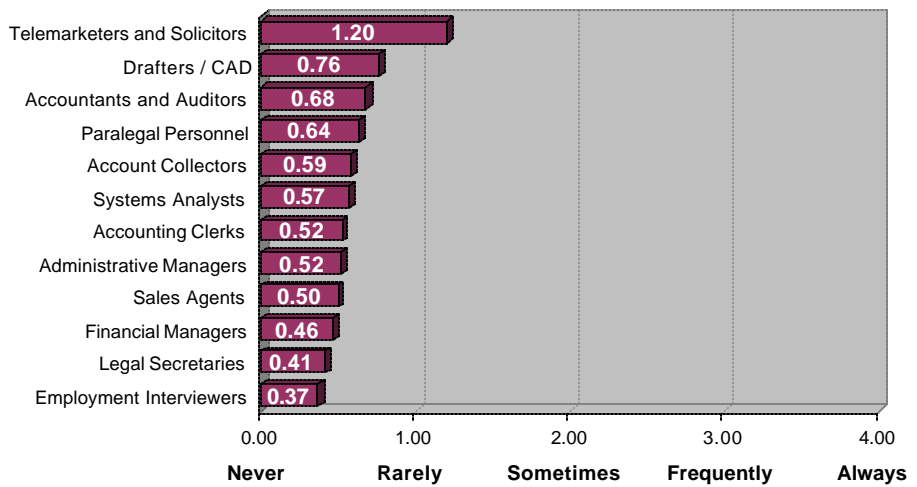


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Telemarketers and Solicitors in part-time positions with greater frequency than they did any other PFSV occupation, but even so, their frequency of hiring part-time Telemarketers and Solicitors still only averaged between 'rarely' and 'sometimes' (1.20). For 11 of the 12 occupations surveyed, firms indicated that, on average, they 'never' to 'rarely' hired individuals part-time (see Figure 145).

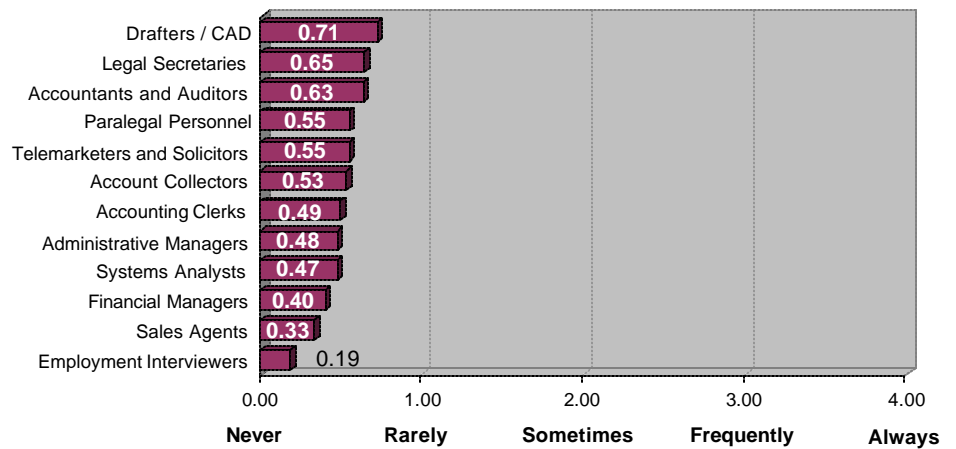
Figure 145. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Drafters / Computer Assisted Drafters (0.71) was the occupation where temporary employees were most frequently hired, followed by Legal Secretaries (0.65) and Accountants and Auditors (0.63). It should be noted that the frequency of hiring temporary workers for each of the 12 PFSV occupations ranged between 'never' and 'rarely', with firms hiring temporary Employment Interviewers (0.19) with the lowest frequency (see Figure 60).

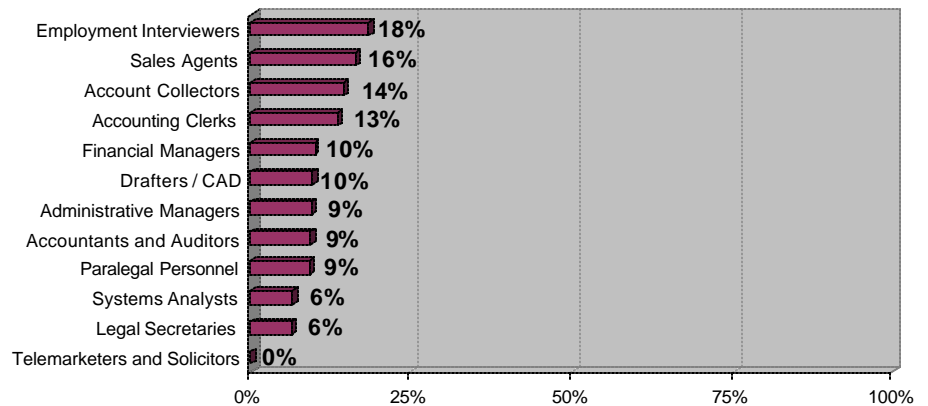
Figure 146. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the 12 PFSV occupations. Eighteen percent of firms hired non-English speaking Employment Interviewers, followed by Sales Agents (16%), Account Collectors (14%), and Accounting Clerks (13%). On the other end of the spectrum, none of the firms hired non-English speaking Telemarketers and Solicitors.

Figure 147. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Professional and Business Services survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

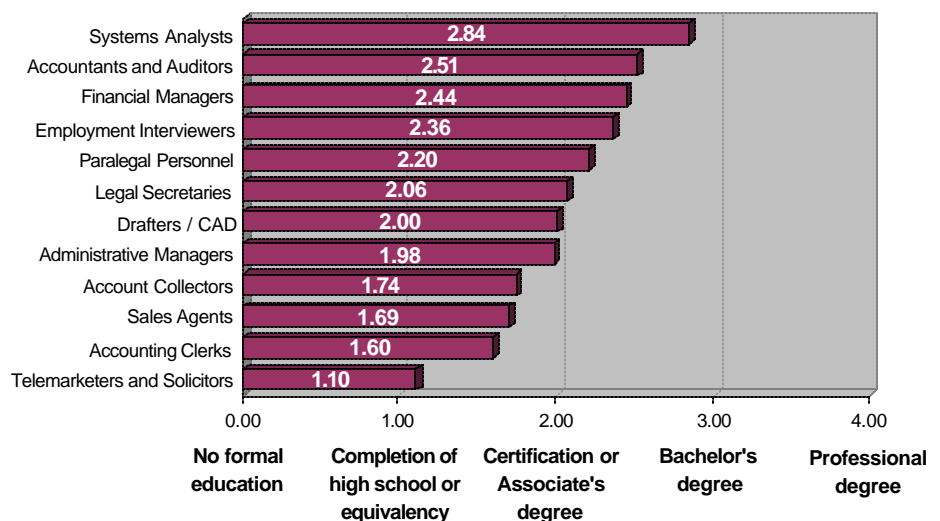
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the 12 PFSV occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where 'Professional degree' = +4, 'Bachelor's degree' = +3, 'Certification or Associate's degree' = +2, 'completion of high school or equivalency' = +1, and 'no formal education requirements' = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least 'Certification or an Associate's degree'.

Systems Analysts had the highest average education requirement (2.84), with most respondents agreeing the position required a Bachelor's degree. Telemarketers and Solicitors had the lowest average educational requirements (1.10), with respondents indicating that applicants needed, on average, slightly more than completion of high school or its equivalent to be successful. For seven of the 12 positions examined, respondents indicated that at least a Certificate or Associate's degree was the average education level of successful applicants (see Figure 148).

Figure 148. Mean Education Requirements by Occupation

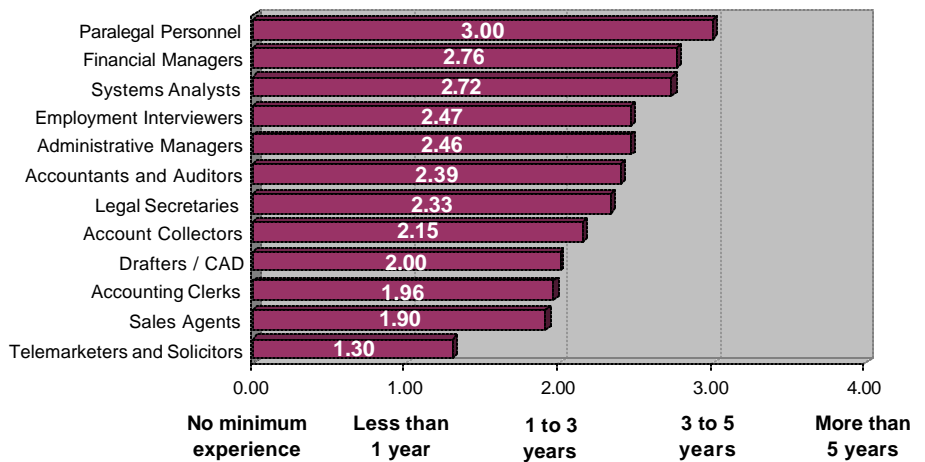


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to Question 19 were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Paralegal Personnel had the highest average experience requirement (3.00) of the 12 occupations examined, followed by Financial Managers (2.76), Systems Analysts (2.72), Employment Interviewers (2.47), and Administrative Services Managers (2.46). On the opposite end of the spectrum, Telemarketers and Solicitors had the lowest average experience requirements (1.10) for applicants’ success (see Figure149).

Figure 149. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each PFSV occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

Fifty-eight percent of firms felt technical competence specific to the position was the most important skill for Systems Analysts and only 13 percent of firms felt that their employees were currently deficient in this skill. For Accounting Clerks, 26 percent of firms felt that interpersonal and communication skills were the most important and 23 percent of firms noted that employees were deficient in communication skills. Figures 150 through 161 display skill importance and deficiency by each occupation.

Figure 150. Financial Managers - Skill Importance and Deficiency

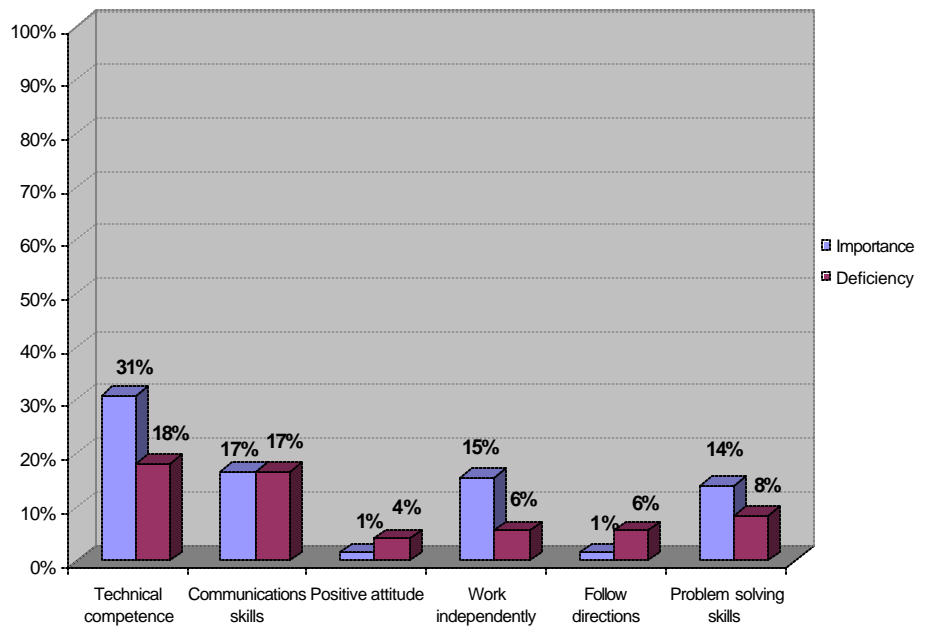


Figure 151. Accountants and Auditors: Skill Importance and Deficiency

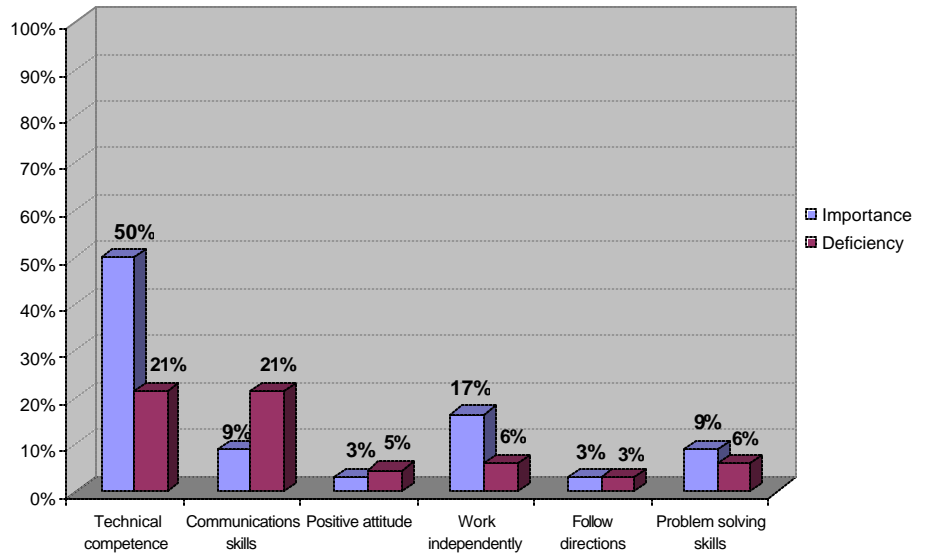


Figure 152. Account Collectors: Skill Importance and Deficiency

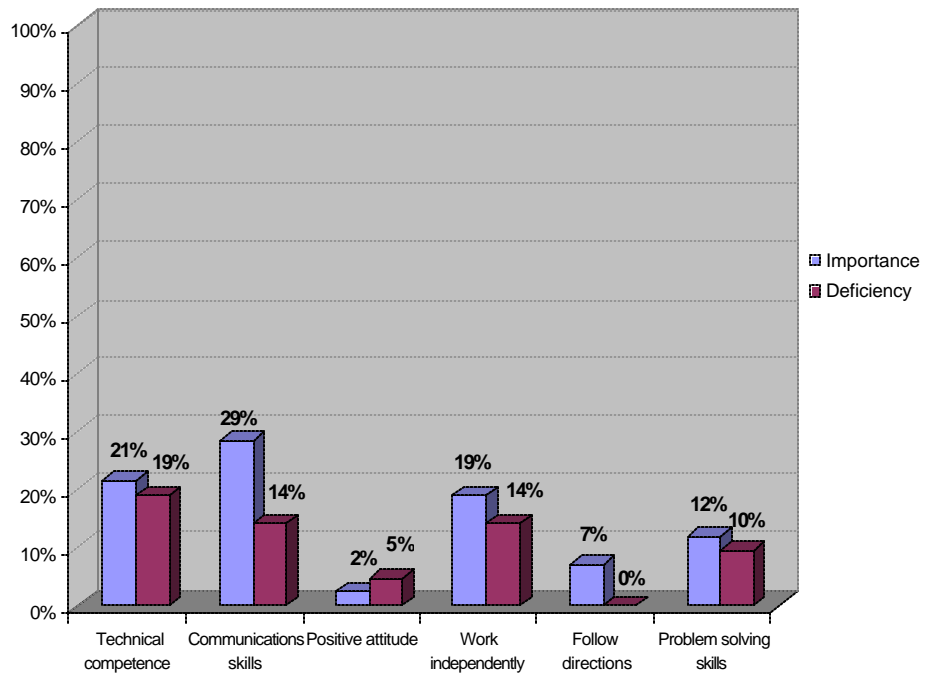


Figure 153. Accounting Clerks: Skill Importance and Deficiency

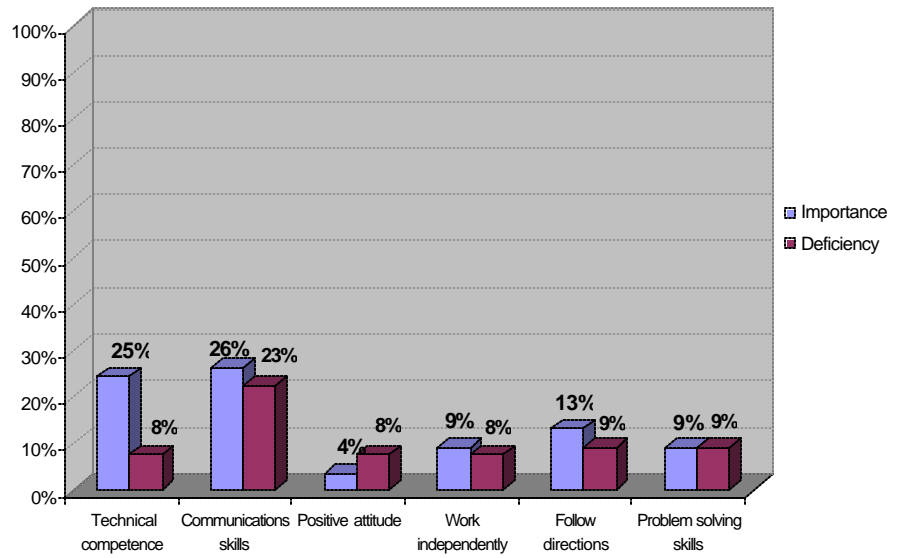


Figure 154. Administrative Services Managers: Skill Importance and Deficiency

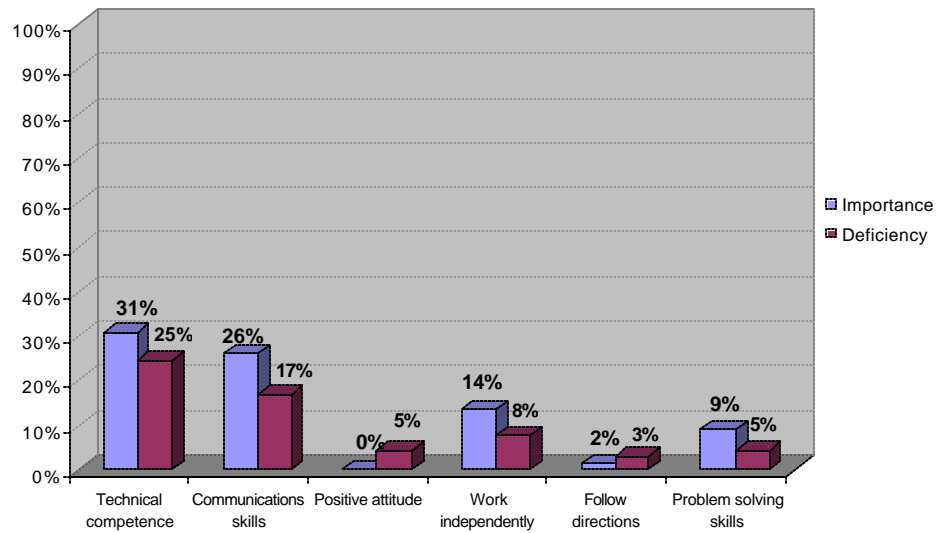


Figure 155. Employment Interviewers: Skill Importance and Deficiency

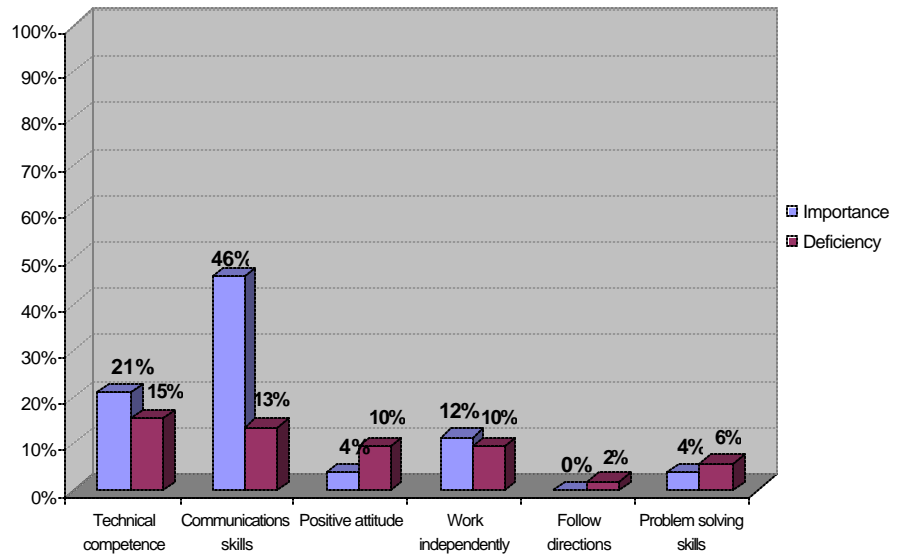


Figure 156. Drafters / Computer Assisted Drafters: Skill Importance and Deficiency

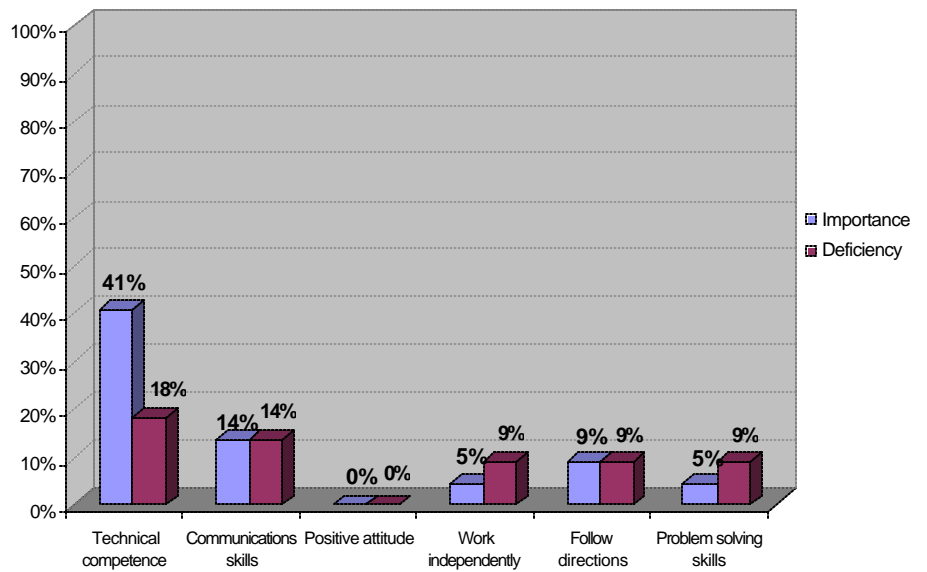


Figure 157. Systems Analysts: Skill Importance and Deficiency

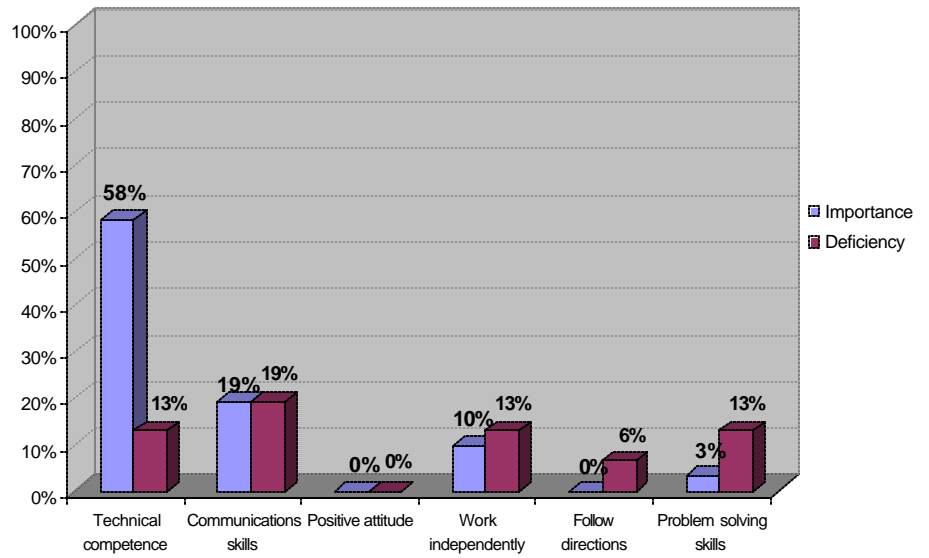


Figure 158. Sales Agents: Skill Importance and Deficiency

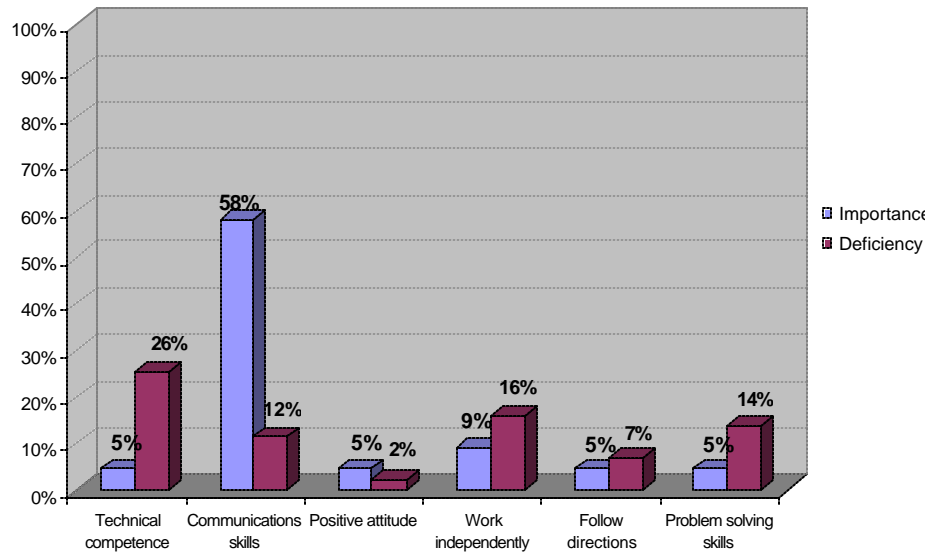


Figure 159. Telemarketers and Solicitors: Skill Importance and Deficiency

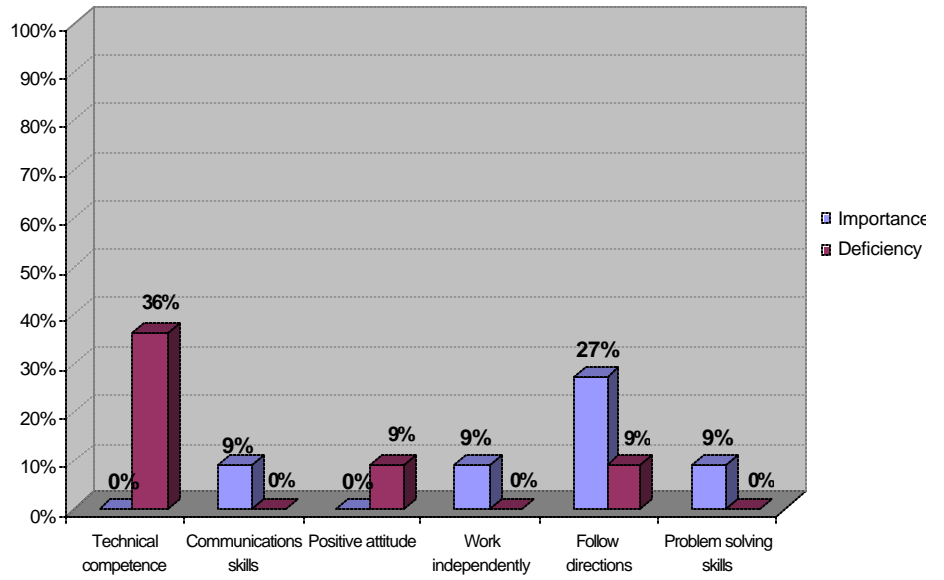


Figure 160. Paralegal Personnel: Skill Importance and Deficiency

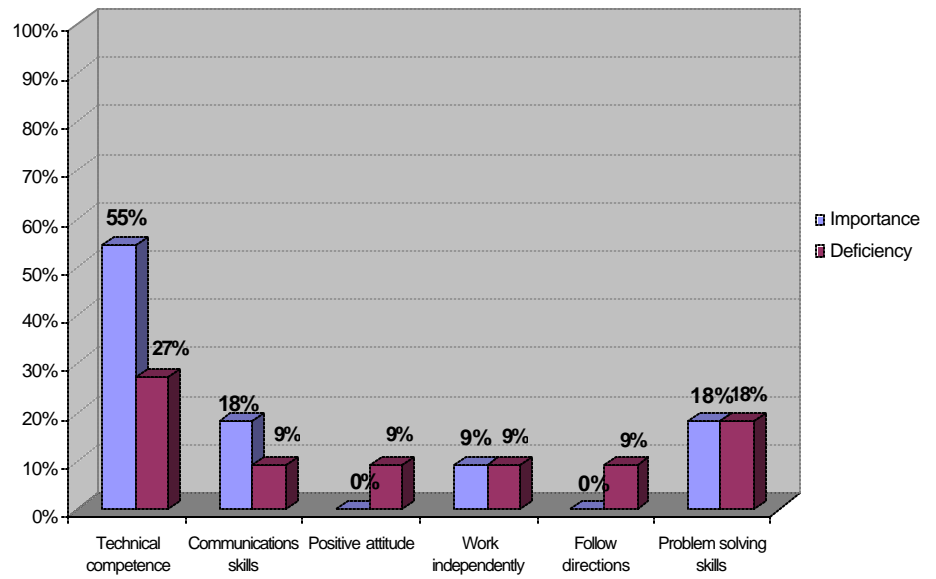
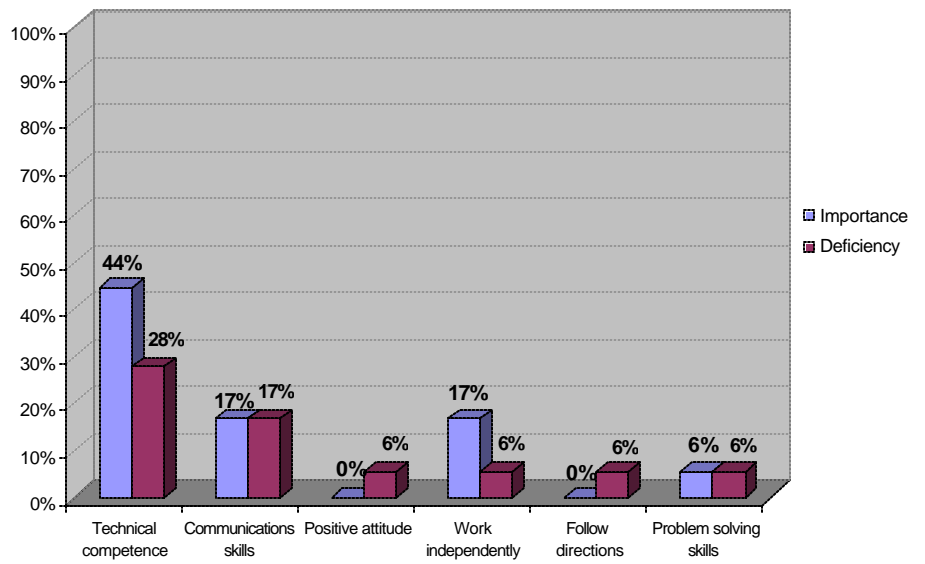


Figure 161. Legal Secretaries: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, five to 33 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For PFSV, Telemarketers and Solicitors, Paralegal Personnel, and Legal Secretaries received less than ten responses for both entry-level and experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Systems Analysts had the highest median^{xlv} and mean^{xlvi} entry-level annual wage (\$52,000 and \$47,947, respectively) as well as the highest median and mean experienced annual wage (\$58,240 and \$52,907, respectively) of the PFSV occupations examined. Financial Managers, along with Systems Analysts, were the only occupations in PFSV to receive more than \$50,000 as the experienced median wage.

Table 45. Professional and Business Services Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Financial Managers	Entry-Level	\$50,000	\$47,434	\$24,960	\$85,000
	Experienced	\$53,500	\$49,882	\$31,200	\$85,000
Accountants and Auditors	Entry-Level	\$35,000	\$37,468	\$22,880	\$72,800
	Experienced	\$40,500	\$42,578	\$22,880	\$77,000
Account Collectors	Entry-Level	\$27,000	\$25,349	\$15,500	\$39,000
	Experienced	\$31,000	\$30,243	\$18,720	\$50,000
Accounting Clerks	Entry-Level	\$28,000	\$27,085	\$15,000	\$43,500
	Experienced	\$31,200	\$30,888	\$20,500	\$48,000
Administrative Managers	Entry-Level	\$28,040	\$31,406	\$23,000	\$55,000
	Experienced	\$32,240	\$36,269	\$24,960	\$75,000
Employment Interviewers	Entry-Level	\$31,500	\$34,962	\$15,000	\$80,000
	Experienced	\$33,500	\$37,741	\$18,000	\$90,000
Drafters / CAD	Entry-Level	\$35,360	\$35,025	\$24,960	\$45,000
	Experienced	\$40,260	\$43,450	\$31,200	\$72,800
Systems Analysts	Entry-Level	\$52,000	\$47,947	\$20,000	\$80,000
	Experienced	\$58,240	\$52,907	\$26,000	\$89,440
Sales Agents	Entry-Level	\$28,000	\$30,330	\$16,640	\$55,000
	Experienced	\$31,100	\$33,561	\$16,640	\$58,000
Telemarketers and Solicitors	Entry-Level	\$20,610	\$23,510	\$14,560	\$41,600
	Experienced	\$21,880	\$27,060	\$16,640	\$47,840
Paralegal Personnel	Entry-Level	\$31,200	\$37,400	\$21,000	\$60,000
	Experienced	\$34,980	\$39,865	\$23,500	\$66,000
Legal Secretaries	Entry-Level	\$31,200	\$34,166	\$20,000	\$45,000
	Experienced	\$37,500	\$37,500	\$23,000	\$52,000

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Financial Managers, Accountants and Auditors, Employment Interviewers, Drafters / Computer Assisted Drafters, Systems Analysts, and Sales Agents, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Account Collectors, Accounting Clerks, Administrative Services Managers, Telemarketers and Solicitors, Paralegal Personnel, and Legal Secretaries, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^{xlv}The median wage represents the mid point in the range of responses if data points are put in sequential order. For Accountants and Auditors the entry-level median wage of \$35,000 means that half of the *entry-level* wages given for Accountants and Auditors lie above \$35,000 and the other half of Accountants and Auditors *entry-level* wages lie below \$35,000.

^{xlvi}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Tourism

The Tourism (TOUR) cluster is made up of firms that provide and arrange a wide array of amusement, recreation, and visitor services. These include hotels and motels, restaurants, travel agencies, and car rental companies.

Question 1 - How many full-time employees work from your business location?

Question 2 - How many part-time employees work from your business location?

Question 3 - Considering the total number of full and part time employees, what percentage of them are temporary?

Question 4 - How many total employees do you expect to have 12 months from now?

Overall, 35 percent of TOUR employees worked full-time, 65 percent worked part-time, and 16 percent were temporary employees (see Table 46). The current workforce of approximately 148,000 employees is expected to decrease by one percent in the next 12 months^{xlvii}. The expected decrease in industry employment represents a loss of approximately 1,800 jobs for Orange County.

Table 46. Industry Employment Practices^{xlviii}

	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment over 12 Months
TOUR	148,064	51,538 35%	96,526 65%	22,983 16%	-1,818 -1%

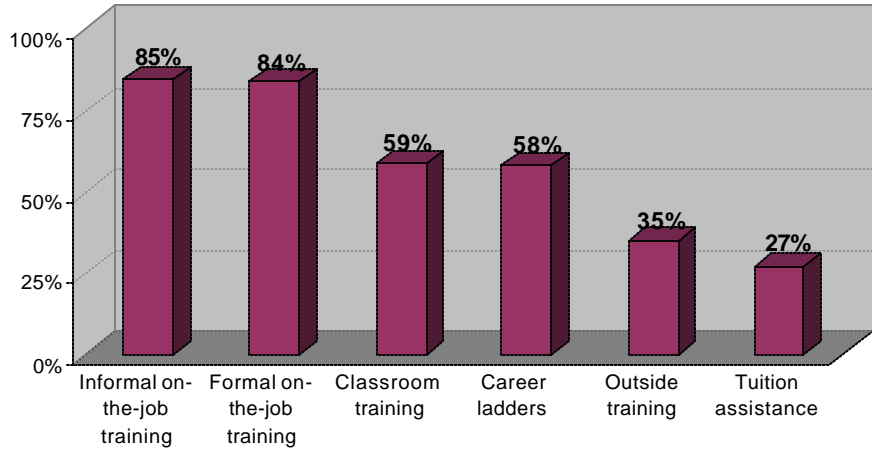
^{xlvii}The survey was administered from March 13, 2002 through April 30, 2002. Any questions asking about the past or future 12-month period should be interpreted as 12 months prior to, or after, the survey administration period.

^{xlviii}Throughout the report, percentages obtained from survey data were applied to the cluster employment total and firm total obtained from Employment Development Department (EDD) data.

Question 5 - Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

In terms of employee development practices, 85 percent of firms reported that they typically utilized informal on-the-job training at their business location, 84 percent used formal on-the-job training, 59 percent utilized in-house classroom training, 58 percent used career development or career ladders, 35 percent offered employer-paid outside training, and 27 percent offered employees tuition assistance at a college or university (see Figure162).

Figure 162. Frequency of Employee Development Practices



Question 6 - Has your business hired employees for any occupation at your location using H-1B Visas?

Approximately 22 percent of Tourism firms have, at one time, used H-1B Visas to hire employees for an occupation (see Table47). In the last 12 months, approximately one in every 323 employees within Tourism was hired using an H-1B Visa (see Table48).

Question 7 - Over the last twelve months from your location, how many employees has your business hired using H-1B visas?

Table 47. Number of Firms that Have Ever Used H-1B Visas to Hire Employees

# of Firms Hiring Using H-1B Visas	Total Firms	% of Total Firms
1,409	6,339	22.22%

Table 48. Number of Employees Hired With H-1B Visas in the Last 12 Months

# of H-1B Visa Employees Hired	Total Employment	% of Total Employees
457	148,064	0.31%

Tourism Occupational Assessment

Question 8 - Do you have employees who fit this occupational description at your business location?

For Tourism, the survey examined 12 occupations: Amusement / Recreation Attendants, Cashiers, Guards / Watch Guards, Guides, Waiters and Waitresses, Food Preparation Workers, Restaurant Cooks, Food Service and Lodging Managers, Bartenders, Maid and Housekeeping Cleaners, Hotel Desk Clerk / Concierges, Travel Agents. Due to insufficient sample size, occupational data will not be presented for Guides, Hotel Desk Clerk / Concierges, and Travel Agents. (See Appendix A for the definition used for each occupation within the survey.)

Respondents were first asked whether their company employed individuals, at their business location, for any of the 12 occupations included in the TOUR survey. Respondents were then asked detailed, occupation-specific questions about six occupations that were randomly selected from among the occupations present at a particular company.

Question 9 - As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Amusement / Recreation Attendants, Cashiers, and Guards / Watch Guards are expected to have the highest percentage turnover of the occupations examined (41%, 37%, and 37%, respectively), whereas Bartenders (14%) and Food Service and Lodging Managers (16%) should have the lowest. Waiters and Waitresses and Restaurant Cooks had the highest 12-month rate of expected growth among TOUR occupations, with 16 percent and 13 percent, respectively. Bartenders (-5%) and Amusement / Recreation Attendants (-2%) was the only occupation with negative expected growth over the next 12 months. Waiters and Waitresses will have the most openings in the next 12 months (1,954) after taking into account the number currently employed, the expected turnover, and the growth rate for that position (see Table49).

Question 10 - How many of the current employees within this occupation will not be working at this company in the same position twelve months from now?

Question 11 - As I read each of the occupations, please tell me how many individuals you estimate will be employed in each of the occupations 12 months from now.

Table 49. Occupational Retention, Turnover, and Growth for the Next 12 Months^{xlix}

	Number Employed	% of Cluster Employment	Expected Turnover	Growth Rate	Openings
Waiters and Waitresses	3,924	3%	34%	16%	1,954
Restaurant Cooks	2,261	2%	26%	13%	866
Food Preparation Workers	1,859	1%	24%	12%	682
Cashiers	1,339	1%	37%	7%	591
Amusement / Recreation Attendants	572	0.4%	41%	-2%	221
Food Service & Lodging Managers	979	1%	16%	5%	204
Bartenders	1,001	1%	14%	-5%	84
Guards / Watch Guards	150	0.1%	37%	11%	72
Maid & Housekeeping Cleaners	121	0.1%	21%	0%	26
Cluster Total	148,064	100%	11%	-1%	14,583

The average turnover and projected employment figures should not be construed as long-term characteristics of each specific occupation, but an indication of respondents' expectations for the next 12 months.

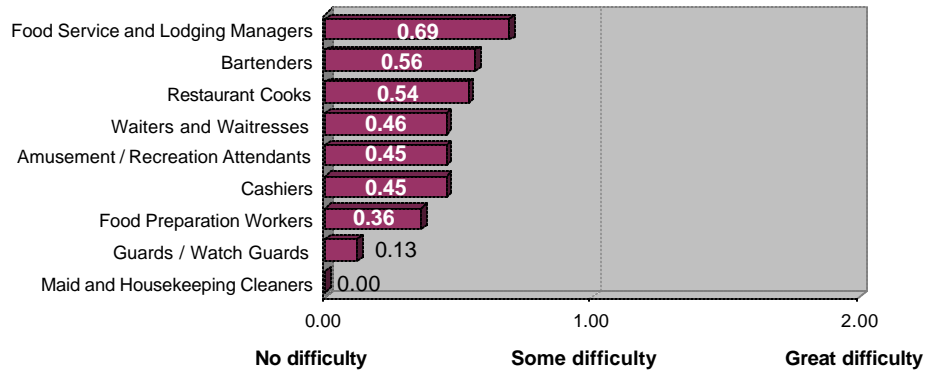
^{xlix}The percentages for average turnover and average growth rate as well the number employed in each occupation were calculated with respondents data applied to the industry cluster employment levels published by the Employment Development Department (EDD) to obtain the figures shown here. With the exception of the number currently employed, the data represent a 12-month projection.

Difficulty Finding Applicants and Recruitment Practices

Question 12 - For the same list of occupations, I'm interested in the level of difficulty your business has in finding experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding experienced applicants.

Respondents were asked whether they had 'great difficulty', 'some difficulty', or 'no difficulty' finding experienced and non-experienced applicants, respectively, for each of the 12 TOUR occupations. Responses to these questions were coded according to a difficulty scale where 'great difficulty' = +2, 'some difficulty' = +1, and 'no difficulty' = 0. A score of 1.00 would indicate that, on average, firms had 'some difficulty' finding experienced applicants. TOUR firms had the most difficulty locating experienced Food Service and Lodging Managers (0.69), Bartenders (0.56), and Restaurant Cooks (0.54). On the other end of the spectrum, firms did not have any difficulty finding experienced Maid and Housekeeping Cleaners (0.00).

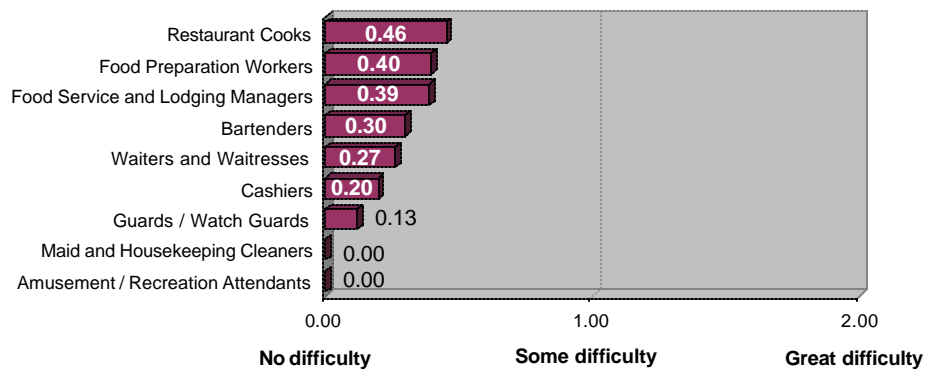
Figure 163. Difficulty Finding Experienced Applicants



Question 13 - For those occupations where you hire entry-level applicants, please gauge the difficulty your business has in finding non-experienced applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding non-experienced applicants. If you do not hire entry-level applicants for the position, please say so.

Overall, firms had the most difficulty finding non-experienced Restaurant Cooks (0.46), Food Preparation Workers (0.40), and Food Service and Lodging Managers (0.39), whereas firms did not have any difficulty finding non-experienced Amusement / Recreation Attendants or Maid and Housekeeping Cleaners (0.00 each).

Figure 164. Difficulty Finding Non-Experienced Applicants



Question 14 - We're interested in how often your business recruits individuals from outside Orange County for a position. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside Orange County for a position in that occupational category.

Respondents were asked whether they ‘always’, ‘frequently’, ‘sometimes’, ‘rarely’, or ‘never’ recruit outside Orange County for an occupation. Responses to this question were coded according to a frequency scale where ‘always’ = +4, ‘frequently’ = +3, ‘sometimes’ = +2, ‘rarely’ = +1, and ‘never’ = 0. A score of 2.00 would indicate that, on average, firms ‘sometimes’ recruited outside Orange County for a given occupation. On average, Amusement / Recreation Attendants (1.40) was the occupation most often recruited from outside the County, followed by Restaurant Cooks (1.06), Bartenders (1.05), and Food Service and Lodging Managers (1.00). It should be noted that for four of the nine occupations, firms ‘rarely’ to ‘sometimes’ recruited outside the County.

Figure 165. Recruitment Outside of Orange County

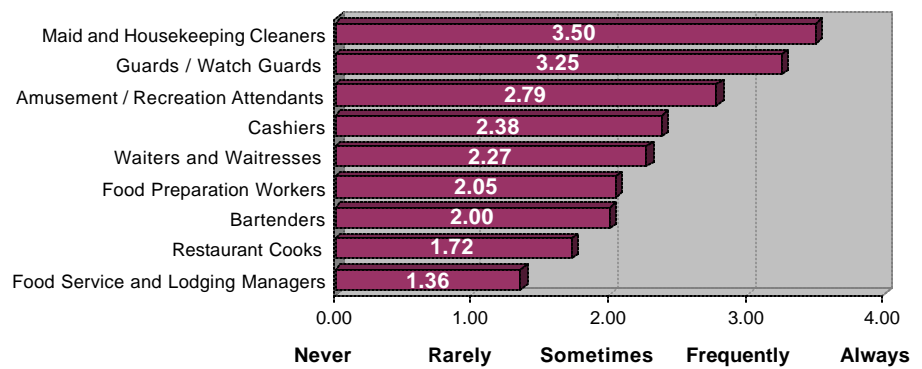


Hiring Practices

Question 15 - For the same list of occupations, we'd like to know how often your business hires part-time workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires part-time workers for a position in that occupational category.

Respondents were asked how often their businesses hire part-time and temporary workers, respectively, at their business location. The responses to these questions were coded according to a frequency scale where 'always' = +4, 'frequently' = +3, 'sometimes' = +2, 'rarely' = +1, and 'never' = 0. A score of 2.00 would indicate that, on average, firms 'sometimes' hired part-time or temporary workers. Firms hired Maid and Housekeeping Cleaners in part-time positions with greater frequency than they did any other TOUR occupation (3.50), followed by Guards / Watch Guards (3.25), and Amusement / Recreation Attendants (2.79). For five of the nine occupations surveyed, firms indicated that, on average, they 'sometimes' to 'frequently' hired individuals part-time (see Figure 166).

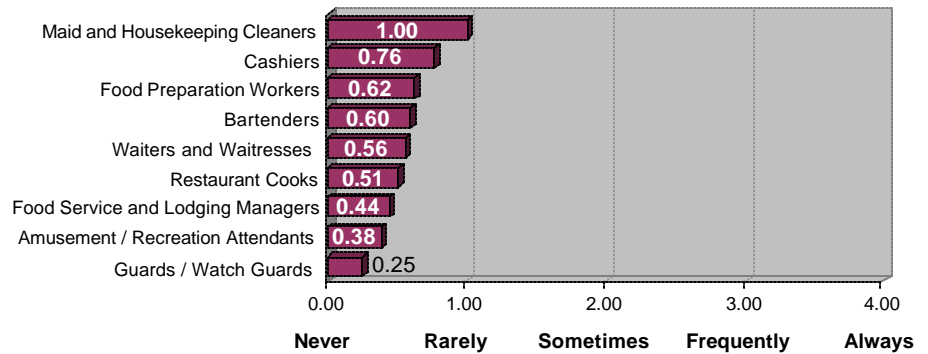
Figure 166. Frequency of Hiring Part-Time Employees



Question 16 - Same question, only this time we're interested in temporary workers. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires temporary workers for a position in that occupational category.

Of the occupations examined, Maid and Housekeeping Cleaners (1.00) was the occupation where temporary employees were most frequently hired, followed by Cashiers (0.76) and Food Preparation Workers (0.62). It should be noted that the frequency of hiring temporary workers for eight of the nine TOUR occupations ranged between 'never' and 'rarely', with firms hiring temporary Guards / Watch Guards (0.25) with the lowest frequency (see Figure 167).

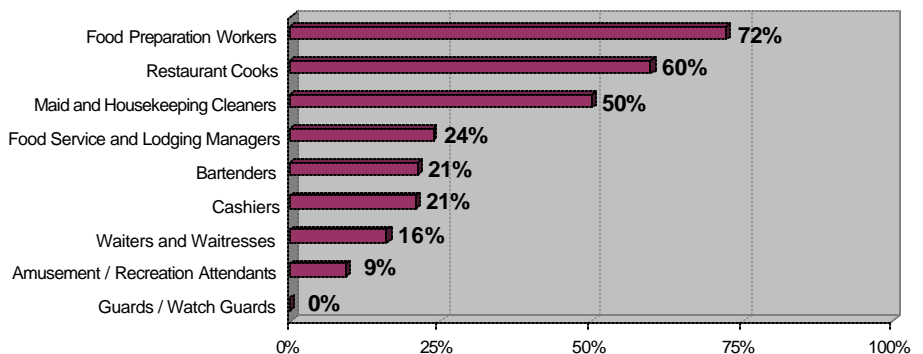
Figure 167. Frequency of Hiring Temporary Employees



Question 17 - As I read the same list of occupations, please tell me for each occupation whether your business location hires applicants who do not speak English.

Firms were next asked to indicate whether or not their business location hires applicants who do not speak English for each of the nine TOUR occupations. Seventy-two percent of firms hired non-English speaking Food Preparation Workers, followed by Restaurant Cooks (60%), Maid and Housekeeping Cleaners (50%), and Food Service and Lodging Managers (24%). On the other end of the spectrum, none of the firms hired non-English speaking Guards / Watch Guards.

Figure 168. Percentage of Business Locations that Hire Non-English Speaking Applicants



Education, Experience and Skill Assessments

The Tourism survey determined the average education and experience requirements for successful applicants for each occupation, as well as the most important skill and the most deficient skill associated with each occupation.

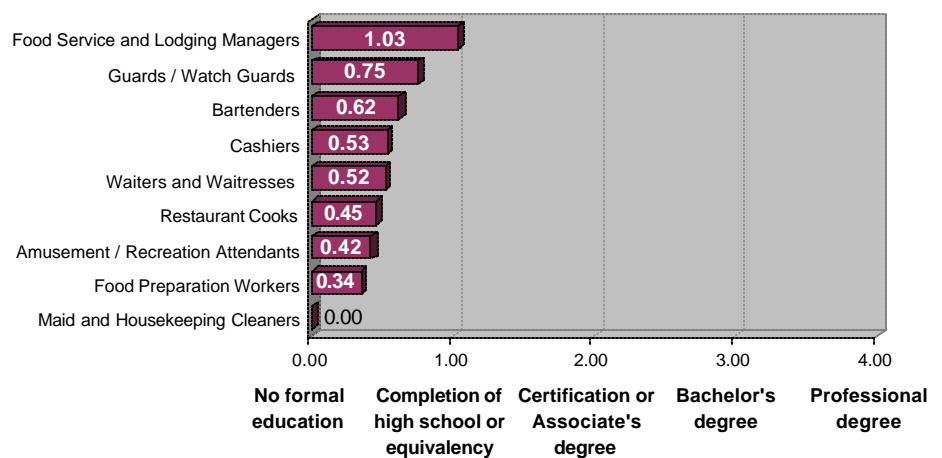
Because firms were asked to indicate the *average or typical* education and experience level required for successful applicants within each of the nine TOUR occupations, responses should not be interpreted as the *optimal* level of education or experience for each occupation.

Question 18 - What is the average level of education for successful applicants in this occupation at your business location?

Responses to this question were coded according to an education scale where 'Professional degree' = +4, 'Bachelor's degree' = +3, 'Certification or Associate's degree' = +2, 'completion of high school or equivalency' = +1, and 'no formal education requirements' = 0. A score of 2.00 would indicate that, on average, firms required applicants have at least 'Certification or an Associate's degree'.

Food Service and Lodging Managers had the highest average education requirement (1.03), with firms agreeing the position required a completion of high school or its equivalency. Maid and Housekeeping Cleaners had the lowest average educational requirements (0.00), with respondents indicating that applicants needed, on average, no formal education to be successful (see Figure 169).

Figure 169. Mean Education Requirements by Occupation

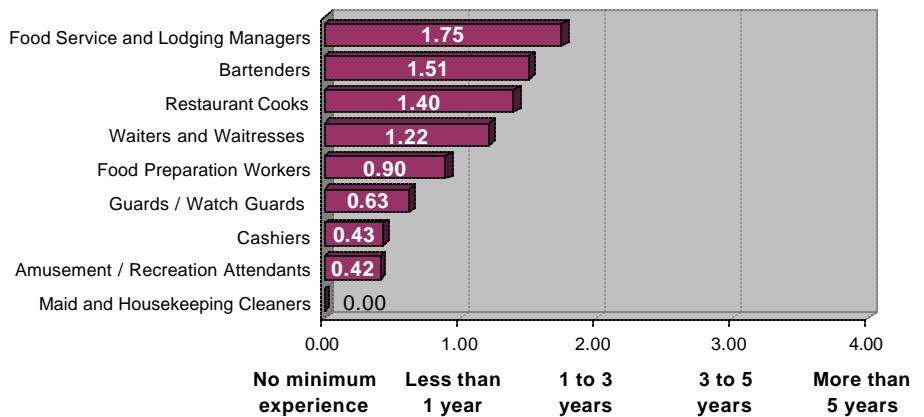


Question 19 - What is the average level of experience for successful applicants in this occupation at your business location?

Responses to Question 19 were coded according to an experience scale where ‘more than five years related experience’ = +4, ‘three to five years of related experience’ = +3, ‘one to three years of related experience’ = +2, ‘less than a year of related experience’ = +1, and ‘no minimum experience requirements’ = 0. A score of 3.00 would indicate that, on average, firms required applicants have at least ‘three to five years of related experience’.

Food Service and Lodging Managers had the highest average experience requirement (1.75) of the nine occupations examined, followed by Bartenders (1.51), Restaurant Cooks (1.40), and Waiters and Waitresses (1.22). On the opposite end of the spectrum, Maid and Housekeeping Cleaners had the lowest average experience requirements (0.00) for applicants’ success (see Figure 170).

Figure 170. Experience Requirements by Occupation



Question 20 - I'm going to read a list of general skills. Please tell me which one of these skills are most important when considering applicants for _____?

Question 21 - I'm going to read the same list of general skills once more. Please tell me which of these skills, _____ are currently most deficient in?

Firms were next asked to consider five general skill sets and determine which of those skills is most important when considering applicants for each TOUR occupation and the skill where current employees exhibit the most deficiency. The general skills included in the survey were: 'Technical competence specific to the position', 'Interpersonal and communication skills', 'Conscientious and maintains a positive attitude', 'Able to work independently', 'Able to follow directions', and 'Creative problem solving skills'.

For six of the nine occupations, firms felt that interpersonal and communication skills were the most important when considering applicants. In particular, 58 percent of firms rated interpersonal and communication skills were the most important for Waiters and Waitresses and 22 percent of firms noted that employees were deficient in communication skills. Figures 171 through 179 display skill importance and deficiency by each occupation.

Figure 171. Amusement / Recreation Attendants: Skill Importance and Deficiency

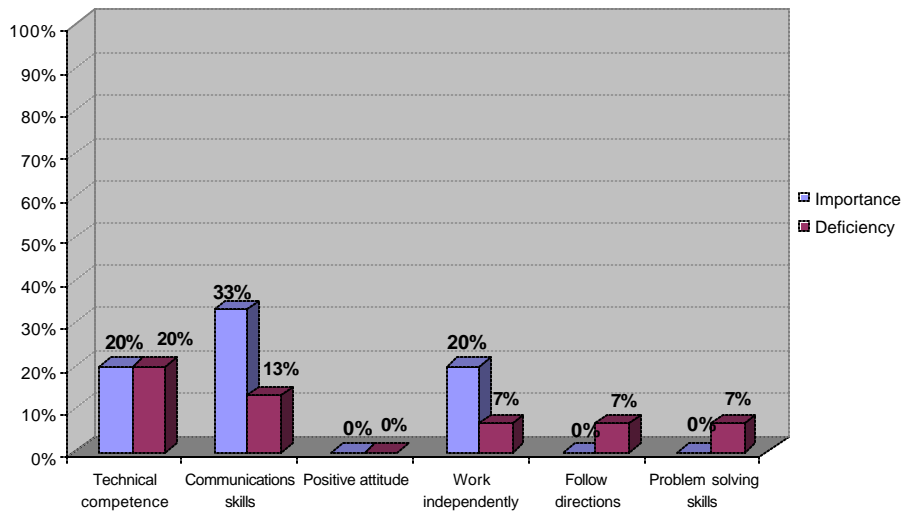


Figure 172. Cashiers: Skill Importance and Deficiency

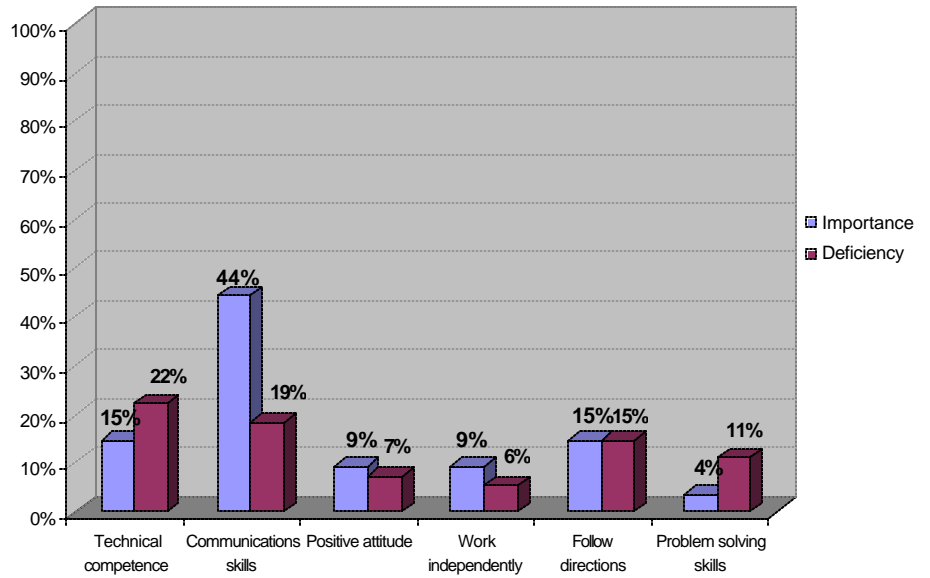


Figure 173. Guard / Watch Guards: Skill Importance and Deficiency

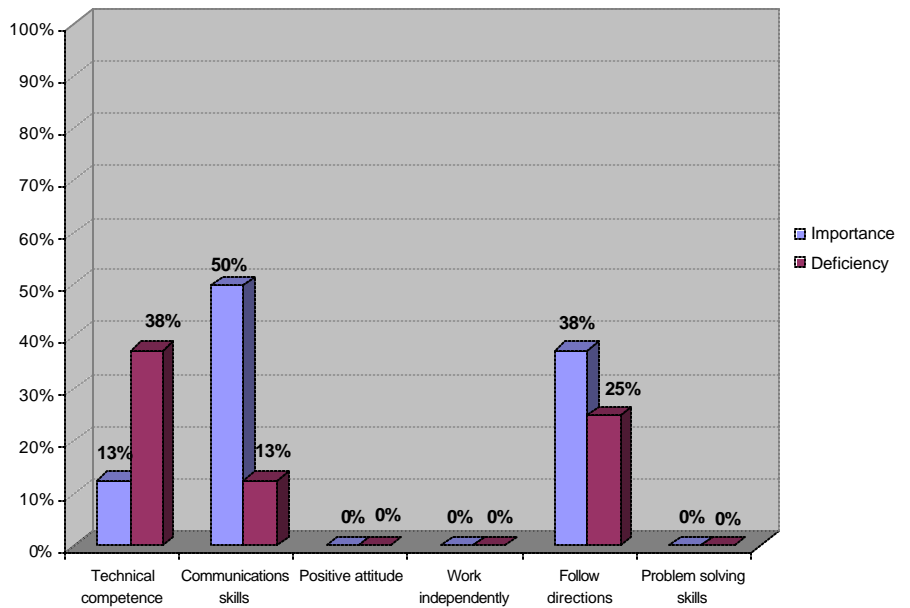


Figure 174. Waiters and Waitresses: Skill Importance and Deficiency

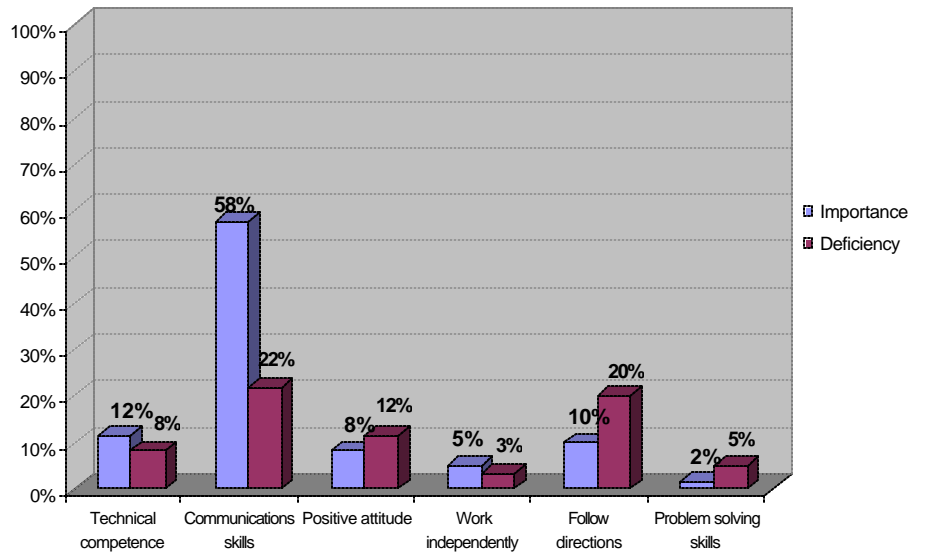


Figure 175. Food Preparation Workers: Skill Importance and Deficiency

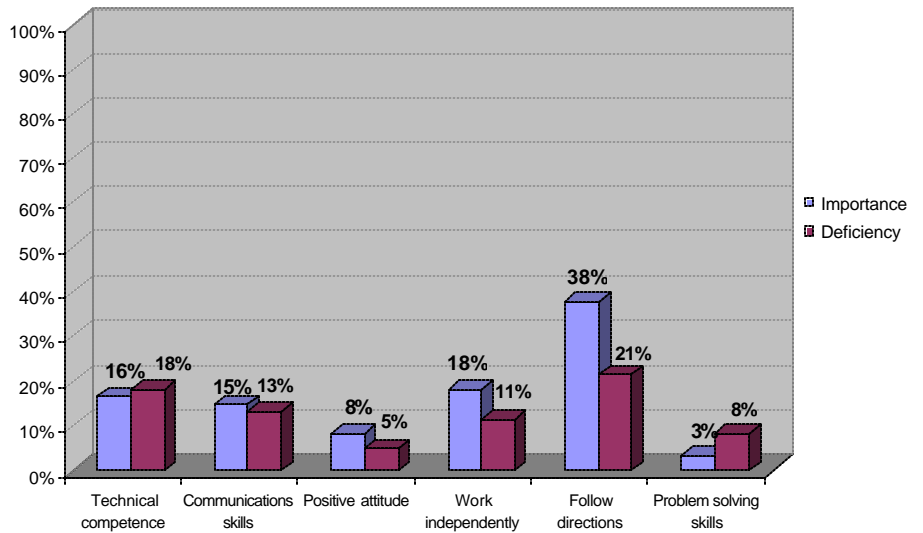


Figure 176. Restaurant Cooks: Skill Importance and Deficiency

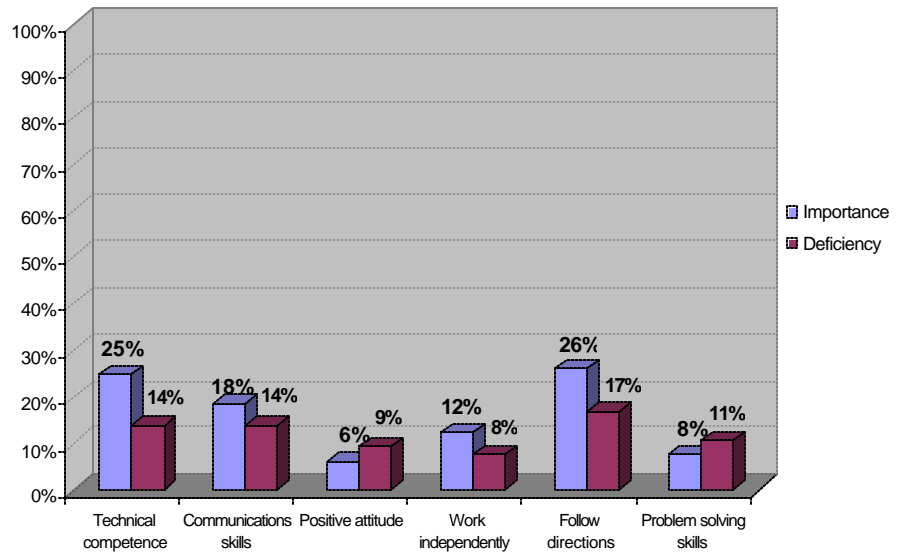


Figure 177. Food Service and Lodging Managers: Skill Importance and Deficiency

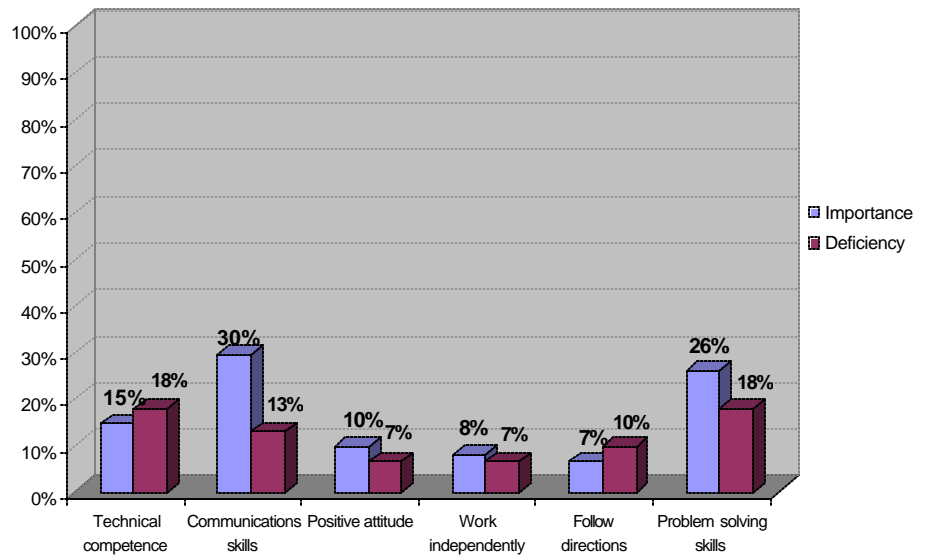


Figure 178. Bartenders: Skill Importance and Deficiency

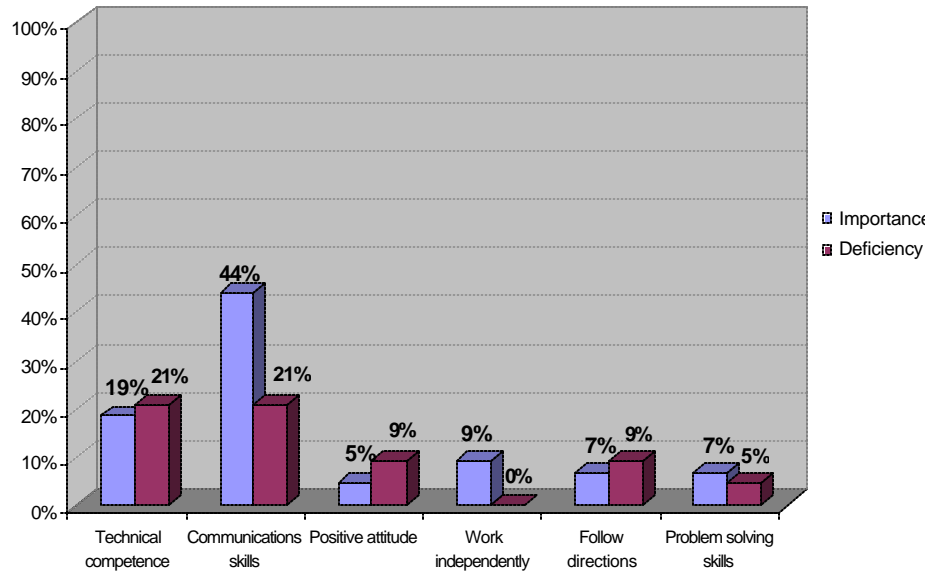
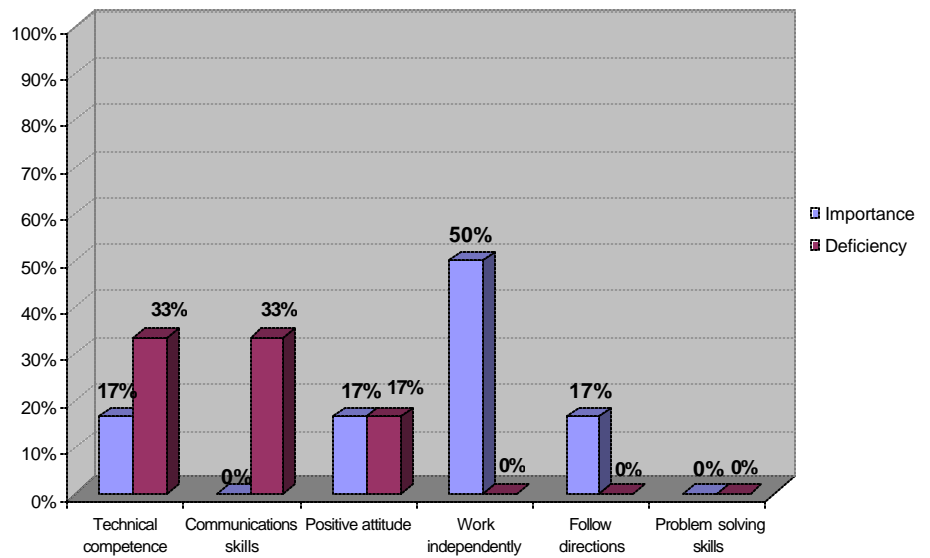


Figure 179. Maid and Housekeeping Cleaners: Skill Importance and Deficiency



Wages

The question of wages, as part of an occupational survey, presents specific challenges. Depending on the occupation, five to 33 percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For TOUR, Guards / Watch Guards and Maid and Housekeeping Cleaners received less than ten responses for either entry-level or experienced wages. For this reason, GRA cautions against generalizing the wages to the population of individuals employed in these occupations.

For those respondents that *did* provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages.

Question 22 - What is the typical pay for new hire employees in each of the occupational categories?

Question 23 - What is the typical pay for employees who have been with the company in that occupation for three or more years?

Food Service and Lodging Managers had the highest median^l and mean^{li} entry-level annual wage (\$25,000 and \$26,236, respectively) as well as the highest median and mean experienced annual wage (\$30,600 and \$30,795, respectively) of the TOUR occupations examined. Restaurant Cooks, along with Food Service and Lodging Managers, were the only occupations in TOUR to receive more than \$20,000 as the experienced median wage.

Table 50. Tourism Entry-Level and Experienced Annual Wages by Occupation

		Median	Mean	Minimum	Maximum
Amusement / Recreation Attendants	Entry-Level	\$14,040	\$14,116	\$14,040	\$14,560
	Experienced	\$14,560	\$16,224	\$14,040	\$24,960
Cashiers	Entry-Level	\$14,040	\$14,322	\$14,040	\$16,640
	Experienced	\$15,600	\$16,053	\$14,040	\$24,960
Guards / Watch Guards	Entry-Level	\$15,860	\$17,615	\$14,040	\$24,960
	Experienced	\$17,680	\$18,869	\$14,560	\$27,040
Waiters and Waitresses	Entry-Level	\$14,040	\$14,055	\$14,040	\$14,560
	Experienced	\$14,040	\$14,288	\$14,040	\$16,640
Food Preparation Workers	Entry-Level	\$14,560	\$15,234	\$14,040	\$20,800
	Experienced	\$16,640	\$17,500	\$14,040	\$24,960
Restaurant Cooks	Entry-Level	\$16,640	\$17,252	\$14,040	\$30,000
	Experienced	\$20,800	\$21,437	\$14,040	\$40,000
Food Service and Lodging Managers	Entry-Level	\$25,000	\$26,236	\$14,040	\$50,000
	Experienced	\$30,600	\$30,795	\$14,040	\$55,000
Bartenders	Entry-Level	\$14,040	\$15,474	\$14,040	\$24,960
	Experienced	\$14,560	\$17,044	\$14,040	\$31,200
Maid and Housekeeping Cleaners	Entry-Level	\$14,040	\$14,127	\$14,040	\$14,560
	Experienced	\$17,680	\$17,853	\$14,040	\$24,960

The wage data presented here were filtered by taking out the extreme highs and lows for each occupation. For Food Service and Lodging Managers, the valid entry-level and experienced annual wages were between \$14,001 and \$250,000. Wages falling outside this range were discarded. For Amusement / Recreation Attendants, Cashiers, Guards / Watch Guards, Waiters and Waitresses, Food Preparation Workers, Restaurant Cooks, Bartenders, Maid and Housekeeping Cleaners, the valid entry-level and experienced annual wages were between \$14,001 and \$100,000. Wages falling outside this range were discarded.

^lThe median wage represents the mid point in the range of responses if data points are put in sequential order. For Food Preparation Workers the entry-level median wage of \$14,560 means that half of the *entry-level* wages given for Food Preparation Workers lie above \$14,560 and the other half of Food Preparation Workers *entry-level* wages lie below \$14,560.

^{li}The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.