Employer engagement with new apprenticeships in the electrotechnology industry

Final Report

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1. Introduction

1.1 Background

Apprenticeships have been a critical element in skill formation in Australian industry over the last two centuries. They continue to be central to the supply of skills within many industries and occupations, particularly in the skilled trades. There has also been strong growth in the number of places in vocational education and training and in higher education in the last decade. An important aspect of this growth in the last few years at least has been the expansion in apprenticeship and traineeship places, now combined under the comprehensive title of New Apprenticeships.

Nevertheless, there has been growing concern among a number of industry sectors, particularly those in the skilled trade areas, over the adequacy of the supply of skills, particularly apprentices. Various studies of apprenticeships in recent years have revealed a range of barriers to increasing the level of apprentice numbers (e.g. DETYA 1998, DEWRSB 1998, 1999, Dumbrell et al forthcoming). These concerns led to a concerted effort by industry and government to examine and overcome skill shortage issues in a range of industry sectors.

In September 1999 the Hon Dr David Kemp MP, Minister for Education, Training and Youth Affairs, met with Chief Executive Officers of the Australian Chamber of Commerce and Industry, the Business Council of Australia and the Australian Industry Group to examine skill shortage issues in the traditional trades, including the electrotechnology trades. This gave rise to the Commonwealth Government's National Industry Skills Initiative which established a series of Working Groups to examine skill shortages in particular industry sectors.

The Electrotechnology Working Group was established and prepared a report on skill shortages in electrotechnology in 2000. Based on analytical work carried out by the NCVER and the Department of Employment, Workplace Relations and Small Business (DEWRSB), the NCVER published a report titled *Evidence of skill shortages in the electrotechnology trades*. In the report, it was concluded that some skill shortages were emerging in Australia's skilled electrotechnology trades.

Data supplied to NCVER by the Department of Employment, Workplace Relations and Small Business (DEWRSB) indicated that net migration and wastage from the electrotechnology trades in general is projected to be relatively low and lower than for trades generally. However, DEWRSB's skilled vacancy survey showed substantial growth in electrotechnology skilled vacancies during 1998 and 1999.

The report concluded that issues of continuing concern include the level of retention within apprenticeships as well as the current and expected high levels of demand in certain sectors. In particular, it was found that apprentice and trainee completions are not sufficient to supply all the projected employment growth and greater priority needs to be placed on training pathways outside of the new apprenticeship system.

The report also suggests that, in the future, employers in the electrotechnology trades will need to consider looking further than teenagers for new entrants as the number of young people aged 15 to 24 years will stagnate in the future. The report also suggests that even more critical than increasing numbers in training will be the issue of the relevance and quality of training for existing workers, as well as new entrants, to the electrotechnology trades to keep apace of the rapid technological changes in the industry. The key findings of the Taskforce's report were that

1. There are current skill shortages in identified electrotechnology trade areas despite growth in numbers in structured training.

2. There are growing employment rates in high technology areas, especially voice and data communications.

3. At the same time, enterprises are undergoing structural changes resulting in increased contract work leading to market demands for new skill sets.

4. New apprenticeship opportunities are not adequate and employer investment remains low. This demonstrates that not enough employers currently recognise the benefits of training nor are they aware of the potential for flexible training arrangements under new apprenticeships.

5. There are critical issues for the industry in areas of demand for traditional trade skills and for new skill sets and the supply of skilled workers:

    - High employment growth in specific sectors requiring more skilled tradespersons and new technology skill sets, and

    - Supply of skilled workers remains an issue as qualified tradespersons leave the industry for alternative careers.

6. Flexibility in addressing skills needs and shortages is affected by licensing, safety and technical-based regulation.

7. There is a need for employers, industry and training personnel to consider flexible and alternative pathways for trainees and apprentices in order to:

    - Make a career in electrotechnology both more attractive and more accessible, and

    - Provide appropriate training pathways that will lead to improved retention rates and outcomes appropriate to market demand.

In subsequently formulating its Action Plan in July 2000, the Taskforce focussed on three specific projects arising out of its initial report to the Minister. These projects are

- Careers project
- Employer engagement survey
- Group Training Targeted Initiative Program.

The NCVER has prepared this report for the Electrotechnology Working Group and the Commonwealth Department of Employment, Training and Youth Affairs on the second of these as part of the Commonwealth Government's Industry Skills Initiative through contract with the Department of Education, Training and Youth Affairs.

This report looks specifically at the triggers of employer engagement with apprentices in the electrotechnology sector against the background of increasing levels of new apprenticeships.

1.2 Methodology

The project consisted of four parts:

- A literature review
- A statistical analysis of trends in industry and new apprentice trends
- A qualitative interview phase with firms in the industry
- A survey of employers in the industry.

Literature review

The literature review examined previous research on employer uptake of training across industries, focusing on drivers of employer recruitment. It found that most literature had concentrated on the processes of training within the enterprise and the benefits of training to employers. Relatively little research has been conducted on drivers for apprentice employment.

Statistical analysis of trends in industry and new apprentice trends

Desktop analysis was undertaken looking at broad employment patterns and forecasts using ABS data and information provided by the DEWRSB. NCVER data on New Apprentices was looked at based on trends between 1995 and 2000. Issues of skill shortage and trends in demand and supply of skill to the industry were examined against this background.

Qualitative interview phase with firms in the industry

Seventeen interviews were conducted in Brisbane, Sydney and rural NSW between 29 and 31 January 2001. Fourteen of these interviews were with firms ranging from sole trader to major employer. Seven were traditional trainers (i.e. those who had recruited an apprentice more than three years ago), two were recent trainers (under three years) and five were non-trainers (i.e. those who had never employed an apprentice). Three group training companies were also interviewed.

The main purpose of the interviews was to identify the factors influencing an employer's decision to engage an apprentice, as well as gaining an understanding of their attitudes and experiences while working with and training an apprentice.

Survey of employers

A survey of contractors in the electrotechnology industry was undertaken during March/April 2001 to gain a better understanding of their engagement with new apprentices, specifically to understand who does and doesn't employ an apprentice. The firms surveyed were sampled from NECA's membership database. A randomly selected sample was stratified by State, business size and sector to ensure a representative sample of firms was interviewed. A response rate of 70% was achieved. Typically the respondent to the surveys was the owner/manager of the business (89%) or in the case of larger firms, a senior manager (11%). Group Training Companies were not included in the survey of employers. As a result, the survey does not report on the behavior of group training companies. The survey's emphasis is on how employers engage with apprentices, whether they are employed directly or through a group training company.

In order to gain a better understanding of firms' motivations the sample was segmented into three groups:

- Traditional trainers – those that took on an apprentice more than 3 years ago
- Recent trainers – those that had taken on an apprentice for the first time in the last three years, and
- Non trainers – those not currently employing an apprentice.

A sample quota was set up for each group to enable a reasonable level of analysis. The resulting quotas were as follows:

- Traditional trainers – 350
- Recent trainers – 200
- Non trainers – 350.

Firms were initially asked to answer a number of 'screening' questions to determine which segment they belonged to. As a result, just over 2200 firms were interviewed and reported information on their business characteristics and details on whether they employed an apprentice or not. Of this group, 901 businesses answered further questions relating to why they did and did not employ apprentices.

Firms are distinguished by size as follows:

- Sole trader
- Two to five employees (micro firm)

- Six to nineteen employees (medium)
- Twenty or more employees (large)

A regression analysis was undertaken based on survey findings.

Apprentices in this study refer to a contract of training which would normally take four years of work and on and off-the-job training to complete.

2. Key Findings

The two principal drivers of apprentice employment in the electrotechnology industry are:

- Firm size, and
- Availability / continuity of work.

Larger firms are much more likely to employ apprentices with 82% of all apprentices employed by medium and large firms. About two thirds of all apprentices (68%) were employed directly with the remaining third (32%) being hosted through a group training company.

However, employers attracted to recruiting apprentices in the last three years are more likely to be in smaller firms than employers who traditionally recruit apprentices (63% compared to 37%). This suggests that recent changes to New Apprenticeships may have attracted smaller employers to recruit apprentices.

Apprentices comprise a considerable proportion of the workforce employed by micro and medium-sized firms. Approximately one in three micro business employees is an apprentice compared to one in five among medium-sized and one in ten in larger firms. Micro and medium sized firms also employ a disproportionate share of apprentices within the industry considering their contribution to total employment. Together they account for nearly half of all apprentice employment (49%) but under a third (31%) of total employment. Large businesses, which employ just over half of all apprentices, account for over two thirds (68%) of total employment in the sector. This finding shows that apprentices contribute to a greater extent to commercial outcomes of smaller businesses in the electrotechnology sector and are a more important source of labour.

2.1 Background to the industry

Supply and demand in the sector

The electrotechnology industry turnover in Australia in 2000 was $50 billion, with the contracting sector accounting for $6.1 billion.

The industry has the third highest trade workforce behind building and construction and the metal trades (2.1% of total employment in Australia). However, total employment in the electrotechnology trades declined by 1.7% between 1998 (179,100) and 2000 (173,100).

The supply of skills to meet growing demand is potentially below demand despite having relatively high levels of qualified tradespeople in the workforce (70%). This arises because:

- The proportion of the skilled workforce in training is about 8% compared with 11% for the whole skilled trades workforce
- Retention rates for new apprentices are at around 68%
- The number in training in newer high technology areas remains low compared to traditional areas such as electricians.

Over the period 1995 to 2000 the numbers of apprentices in training grew by 1.0% annually compared to 3.6% growth for all trades. Commencements (lead trend indicators) fell at about 1% annually with most of the decline occurring between 1999 and 2000 (-20.8%). Communications commencements grew strongly to 2000 (20.7%) from a low base. Growth has slumped by 36.2% between 1999 and 2000. In 2000 commencement in communications constituted only 3% of total commencements in the sector.

Apprenticeships continue to be dominated by young people (15 to 24) who make up over 85% of all those in training although the older age group (25+) experienced the strongest growth

over the period. The traditional model of four year contracts of training continues to be preferred (over 95% two years or more).

Overall, the supply and stock of skills in the industry suggest the industry is in a relatively strong position in terms of skill level. However, changes in the structure of the industry and new skill demands are likely to put pressure on the industry where currently two thirds of the apprentices in the sector (68.6%) are 'traditional' electricians with only around 2% in communications.

Voice and data exemplifies the changing structure of the industry. Although it is a relatively new and emerging area within the electrotechnology sector, a large proportion of firms (45%) were operated within it. This is also an area likely to be impacted by the use of new technologies and will therefore demand different skills to those traditionally required by the industry.

Prospects for increased opportunities for New Apprentices

Almost half (48%) of all firms interviewed employed an apprentice.

The outlook for recruitment in the industry over the short to medium term is quite positive. According to firms surveyed, the recruitment of apprentices to the industry should increase over the next three years with about a quarter (27%) of firms currently training an apprentice expecting to increase recruitment. This compares with nearly 60% expecting to maintain current levels of recruitment and 10% expecting to reduce recruitment.

The survey reveals a useful distinction between 'traditional' trainers, that is those firms that have been regularly employing apprentices for many years, and 'recent' trainers – those that have employed apprentices only within the last three years.

Recent trainers were more optimistic in their outlook than traditional trainers with 42% expecting to increase recruitment compared to 18%. However, traditional trainers expect to maintain current levels of recruitment (63%).

Additionally most firms (57%) who had never employed an apprentice in the past would be likely to do so should business prospects improve.

There is very little difference between the average time spent in the industry by the different sized firms. The only differences are that sole traders (28 years) have slightly more experience than all other businesses and, recent trainers (20 years) have less experience than both traditional (27 years) and non-trainers (27 years).

General Attitudes to Apprenticeships

All employers overwhelmingly view training apprentices as a good way to bring new skills into the industry with non-trainers slightly more inclined to this view (94%) compared to traditional trainers (89%) and recent trainers (91%). The view that more apprentices are needed to replace skill was equally strongly supported. Given that half the respondents to the survey started out as an apprentice themselves this is probably not a surprising result.

Larger employers are more likely to view apprentices as cost-effective to employ with around two thirds supporting this view (65%).

Most employers agreed that it was difficult to find good people and that young people should do some vocational subjects at school. This view was supported equally among traditional and recent employers of apprentices and those without any. Almost half employers think that the new flexible arrangements make it easier to employ an apprentice with recent trainers more likely to agree (52%).

The survey found that trainees were virtually unknown in the industry. There would seem to be a need to investigate whether New Apprenticeships can be extended into the industry into areas not currently covered by traditional apprenticeships. This needs to be balanced with the very high levels of support for current arrangements surrounding apprentices.

2.2 Key Drivers of employer engagement

Firm size

Research conducted for this report supports earlier research findings that enterprise size is strongly associated with both diversity and volume of training (Smith/Hayton 99) and that apprentice and trainee training is an important component of overall training (Kapuscinski 00).

Many of the firms interviewed were very small with 66% employing five or fewer employees. Smaller firms were less likely to employ apprentices with less than a half (46%) of micro businesses (2-5) taking on apprentices compared with over three quarters (78%) of medium size businesses and nearly 90% of large employers.

However, employers attracted to recruiting apprentices in the last three years are more likely to be in smaller firms than employers who traditionally recruit apprentices (63% compared to 37%). This suggests that recent changes to New Apprenticeships may have attracted smaller employers to recruit apprentices.

Small firms were less likely to employ apprentices directly with only a third (34%) of micro businesses (2-5 employees) directly employed an apprentice, compared with (61%) of medium and two thirds (69%) of larger firms.

Non-trainers are predominantly very small businesses. Almost nine out of ten (89%) are either sole traders or firms with fewer than five employees. Traditional trainers are more evenly spread across firms with 37% in micro businesses, 42% in medium size firms and 20% in larger businesses. Traditional trainers train more than 4 out of 5 new apprentices (89%) with the majority of these being in larger firms (49%).

Firm size also correlates closely with uptake of apprentices and larger employers were more likely to think they got better skilled workers by employing apprentices (10%) than micro-businesses (5%).

The challenge for the industry is to retain current levels of apprenticeship uptake most importantly in the new and emerging areas such as communications/ voice and data. Predominantly larger firms (6+ employees) operate in this sector of the industry although a substantial proportion (43%) of micro businesses (2 to 5 employees) also operate in the sector. This was the second largest sector of operations for micro businesses after light and power (in which most firms reported operating 88%).

Labour market structure

Mitigating factors in future recruitment include both lack of work and the "type" of work. These two factors relate closely to the structure of the industry which is made up to a large extent of small contractors in a highly volatile market dominated by short contract cycles. In addition, the type of work in the industry requires high level skill which makes it difficult to employ inexperienced and unskilled labour.

The industry is one where firms mainly engage in short term contracts (53% of those surveyed) and where long term contracts are relatively uncommon with only a quarter of firms engaging in this type of contract. Sole traders (10%), micro businesses (20%) and non-trainers (17%) were even less likely to engage in long term contracts and as a result would have to contend with an even more volatile working environment.

About two-thirds of firms employing an apprentice were accustomed to using sub-contractors from within the industry to help complete jobs. Most identified the need for highly skilled workers as the reason for using sub contractors (58% of traditional trainers and 63% of recent trainers).

For non-trainers, the flexibility of employing sub-contractors rated nearly as highly (44%) as the need for skilled workers (49%). For micro firms, skills were more important than for larger firms.

Of those who did not employ apprentices, over a third (37%) cited the “nature of work” as a reason for not taking on apprentices. Capacity to expand (“I just want to stay small”) ranked second followed by “insufficient work”. As noted, earlier, reasons given for employing contractors in place of apprentices because of the need for high skill levels, coupled with regulatory requirements may well account for the large proportion citing “nature of work” as an obstacle to employment. About a half of these employers said they might consider taking on an apprentice in future. Overwhelmingly the factor most likely to influence this decision was an increase in workload with well over half (57%) responding positively.

Business cycle

The report also supports earlier hypotheses that the role of the business cycle and the existence of a training culture appear to have an impact on provision of apprentice and trainee training (Kapuscinski 2000).

The report confirms economic and labour market reasons as a key driver of employer uptake of apprentices. This is particularly evident for employers who have recently taken on apprentices over half (53%) of whom did so to get new labour, and for those who have not taken on apprentices at all, over half (57%) of whom said they would if they had more work. This was less significant for large firms.

Recent trainers seemed to be more likely to be motivated by economic and labour market reasons. They were concerned to see their labour supply maintained, although about a quarter of recent trainers were also keen to put something back into the industry.

Traditional trainers appeared to be motivated quite strongly by what might be called altruistic reasons in addition to labour market needs. They wanted to put something back into the industry and to preserve their enterprise’s traditions in training tradespersons. Slightly more employers in this group also thought apprentices were a cost-effective source of labour (14% compared to 12%). Their longer experience may have given these employers a better appreciation of the returns to investment reaped by the enterprise (and the industry) over time as well as the benefits of apprenticeships in ensuring a supply of skilled labour.

For traditional employers of apprentices, the capacity to train to their own requirements (37%, "allows us to train in the company ways") and to return something back to the industry (36%) were also prominent drivers in addition to labour market requirements (19%).

The main benefits of taking on an apprentice were seen as the capacity for flexible and customised training (“train to suit the way I work”: 47%), followed some considerable way behind by “a cost effective source of labour” (23%). These responses were similar across all firm sizes with flexibility and customisation slightly more important to larger firms and cost slightly more important to smaller firms.

Financial incentives

Historical data indicates that financial incentives do have a positive influence on the behavior of firms regarding the employment of apprentices (NCVER:2001). When respondents were presented with the statement "current financial incentives are sufficient", employers strongly disagreed, with 50% of traditional and recent trainers sharing this view and 42% of non-trainers. Also there is a feeling by some firms, particularly non-trainers (36%) that employing apprentices was not cost effective. Existing trainers while very positive about the need to train apprentices nevertheless viewed apprentices as expensive with one in five trainers (19%) reporting that apprentices 'cost you money'.

In addition one in eight (13%) non-trainers indicated they would be influenced by greater financial incentives to take on an apprentice. Given the views reported by employers, it would appear there is scope for a more targeted incentive regime aimed at new and prospective employers. Such a scheme may have dividends in the immediate future.

The use of Group Training Companies

While the report does not focus on the behaviour of group training companies, it does provide useful information on the extent of group training usage by businesses.

It seems that for most employers the experience of using a GTC is a positive one. Only a quarter (23%) of those who acted as GTC hosts believed direct employment to be preferable to using a GTC.

Even though employers appear to be happy using GTCs the most preferred method (37%) of employment is to directly employ an apprentice. Less than one in five (18%) employers currently host an apprentice through a GTC.

In terms of industry structure, the most striking feature of the electrotechnology industry is the high proportion of small firms - one in five (20%) businesses are sole traders and almost half (46%) have between 2-5 employees. Given the structure of the industry it is surprising to see that larger firms are more likely to employ an apprentice through a group training company than smaller firms. This is even more surprising given that one of the aims of Group Training Companies is to facilitate participation in the apprenticeship system by small enterprises.

It is clear that group training companies have become a significant 'player' in the employment of apprentices within the industry. As a result, the role and extent of Group Training Companies should be examined to see if there is greater capacity to assist small and medium size firms to employ apprentices in the electrotechnology sector. Currently, only 14% of micro businesses use group training companies compared to 29% of medium and nearly half of larger companies (43%).

Apprentice supervision and training

Many of the barriers to and perceived disadvantages in employing apprentices seemed to be related to the youthfulness and lack of skills and experience of apprentices and the associated problem that their management cost the employer skilled staff resources. This was perceived as an overall cost to the firm. This perception was consistent across firm size and between recent and traditional trainers with 24% of employers of the view that "apprentices do not have skills in early years to be of much use". Twenty three percent thought they took "a lot of supervision". Nineteen per cent thought "they cost you money".

It is apparent also from the survey that many employers consider that young people often receive inadequate preparation at school for entry to an apprenticeship.

It was also apparent that most tradesmen involved in managing apprentices have not had any specific training in this role. Most employers regarded such training as unnecessary, often on the basis that the tradesmen had been apprentices once themselves. The survey found, for example, that three-quarters of those firms that did have regular meetings with their apprentices to review their progress had tradesmen trained in managing apprentices. It does seem therefore that such training has a positive impact on training practices.

The survey results also suggest that most survey respondents had limited procedures for reviewing the progress of their apprentices. It is likely that improved levels of support for apprentice supervisors in the area of managing apprentices and other training in the industry would improve the ability of supervising tradesmen to relate to young people and provide specific skills in reviewing progress.

2.3 Conclusion and recommendations

The electrotechnology industry is continuing to expand and is moving into increasingly high skilled areas of new technology. Although the industry appears to enjoy reasonable levels of skill and qualifications in its workforce, particular issues related to the business and economic cycle which drive employment may mean reduced supply of adequate skill levels in the future. Coupled with an increasing use of sub-contracting and reduced firm size, these factors may inhibit future growth and expansion in New Apprenticeships without further intervention by both industry and government.

The over riding issue of a potentially volatile economic and business cycle is an on-going problem in a number of trades, particularly building and construction and electrotechnology.

Despite these structural constraints, the outlook for further growth in New Apprenticeships appears to be reasonably optimistic with expansion expected in the short term to medium term. There is also a high level of support among employers in the electrotechnology industry for the apprenticeship system and general satisfaction with current arrangements in place for taking on apprentices.

The biggest disincentive for employers in recruiting apprentices are structural and labour market issues relating to the predominantly contractual nature of work and the high level of skill increasingly demanded of employees in the industry. These reasons have a far greater impact on micro firms and sole traders which dominate the industry.

In response to the report findings the following key areas have been identified to enhance future growth of New Apprenticeships and skills training in the electrotechnology industry.

School to work arrangements

Employers are concerned with the level of skills of new entrants, especially in the early years of their apprenticeship. Most agreed (more than three quarters of employers) that young people should do some vocational training in school. In addition, many employers regard the necessary supervisory 'costs' associated with ensuring new entrants develop a high level of skills as an expensive overhead. School to work issues are therefore a concern and need to be addressed.

The Business Education Partnership Advocate (BEPA) arrangements should be integrated into any strategy that addresses the issue of school to work transition. The BEPA work undertaken to date should provide valuable data in the formulation of any future strategy.

It is recommended that:

- resources be provided to support and build on the work already undertaken under BEPA to improve the skills of new entrants to the industry.

Alternative Pathways

The traditional four-year apprenticeship has served the sector well and continues to do so. However, there is an increasing demand evidenced by this research that more flexible arrangements are needed to widen access for new entrants to the industry. This research identifies demand for high level skills as a disincentive for apprenticeship recruitment to meet the sector's labour and skill needs with 49% of non-training employers citing this as a reasons for not using apprentices. It is likely that this is also arises from the need to meet licensing arrangements.

The need for flexibility both within current apprenticeship and licensing requirements as well as strategies to meet occupational skill requirements through alternative pathways will be critical to meeting ongoing skill needs of the sector. Work needs to be undertaken to identify possible alternative pathways so that new skill formation is not inhibited. The GTC Targeted Placement Program is an example which will provide a sound basis for future work on this issue.

It is recommended that:

- alternative pathways be further investigated, developed and trialled over the next three years
- such pathways to encompass the need for high skill levels at point of entry to the sector and alternatives (eg school-based) to industry pathways
- industry aggressively promote and advocate alternative pathways to businesses.

Group Training Companies

The role of Group Training Companies in providing continuity of employment and training to apprentices and to assisting employers to overcome difficulties experienced with administrative, legislative and supervisory responsibility for apprentices is evident in the industry.

The emphasis in this report has been on how employers engage with apprentices rather than on the behaviour of GTCs. As such the behaviour of GTC employers in contrast to direct employment is largely unknown and needs to further analysed. Nevertheless it is clear from the findings that GTCs provide a service to employers which encourages uptake of apprentices. As such they contribute to employer engagement and their capacity to do this should be further utilised by government.

The predominance of large firms using GTCs is further evidence of the success of the scheme in attracting employers. Nevertheless, further strategies are needed to attract smaller employers to GTCs given their overall dominance of the sector. The capacity of sole traders to recruit apprentices even with the assistance of GTCs is in some doubt given their predominance among non-trainers. Currently, only 14% of micro businesses use group training companies compared to 29% of medium and nearly half of larger companies (43%). There is likely to be considerable potential among micro employers and it is suggested that this area be looked as a priority by industry, government and GTC.

It is recommended that:

- targeted resources be provided to increase the number of group training electrotechnology projects under the Group Training New Apprenticeships Targeted Initiatives Programme for small and medium sized firms;
- the benefits of group training be promoted/marketed to medium sized firms in the industry.
- further work be undertaken to establish the consistency between the survey findings of direct employment with employment through GTCs.

Targeted Incentives and Employer Subsidies

Incentives can influence the engagement decision and 50% of employers thought current incentives were insufficient. Historical evidence (NCVER:2001) suggests a correlation between employer recruitment of apprentices and the introduction of incentives and subsidies. However, across the board changes may not be needed if incentives and subsidies can be targeted to specific areas of skill need. These areas should first be identified through industry and labour market analysis. This will ensure available resources are strategicallyy applied and results can be monitored and evaluated.

Incentive arrangements could

- Identify employers in those sectors where demand is expected to exceed supply
- Encourage non-training employers to take on an apprentice
- Encourage traditional training employers to continue taking on apprentices
- Encourage traditional training employers to increase their commitment.

It is recommended that:

- a review of current levels of incentive and subsidy arrangements be undertaken which identify areas of undersupply
- any such review should take particular note of areas of emerging skill need in the electrotechnology area, specifically in the vital areas of communication/ voice and data already noted
- a targeted incentives regime be developed taking into account the above.

Meeting Sectoral Skill Demands

This report and earlier research (NCVER:1999) shows skill shortages within the industry are sectoral with growth patterns varying across occupations. Communications/ voice and data have been identified in this report as areas of growth.

To meet this need, it is proposed that a targeted brokerage role between industry, training providers and potential new employers be established within industry. In large part the infrastructure to do this already exists through group training companies, Industry Skill Centres and existing industry bodies and New Apprenticeship Centres.

The position would

- provide a placement service for apprentices and employers, having regard to identified skill demands emerging from industry and labour market analyses
- Insure necessary training was available and that existing training is tailored to meet new requirements.
- Facilitate placement in regions of high demand and within appropriate firms
- Provide input to any industry analysis of skill demand.

Industry and labour market analysis

The challenges facing the Electrotechnology industry will change as new technologies becomes outdated and new production methods of providing services take hold. The ability to fully understand changes that are taking place in a timely manner is crucial in order to meet the industries constantly changing skill requirements. Research, such as this report, that pulls together statistics from a variety of sources on a regular basis is important for the industry to stay abreast of its skill and employment needs.

While there is currently a considerable quantum of research and statistics available through such agencies as DEWRSB, NCVER and the ABS, it needs to be tailored to the specific needs of the Electrotechnology Industry. Statistics that focus on tracking skill demand issues within particular industry sectors are important. More emphasise is needed on the analysis of sector specific labour market trends and there impact on the industry. This information needs to be produced on a regular and timely basis so that it becomes an integral part of the planning processes that industry and government undertake.

Key elements of analysis include:

- Identifying emerging skill sets and new requirements
- Econometric studies to identify demand in each sector
- Statistical analysis of labour force demand and supply
- Trend analysis and projections of apprentice and other key data.

Such information should be made available through a website that allows access to sophisticated and targeted information. Such information should be available to all those in the industry involved in human resource issues in the industry including industry associations, employers, RTOs, government and others.

It is recommended that:

- further resources be made available so that existing information relating to skill shortages can be tailored to the needs of the Electrotechnology Industry (and possibly others)
- such information be available through a website and build on existing work.

3. Employer Engagement with Apprentices

3.1 Overview

The overall conclusion to be drawn from the survey is that the outlook for apprentice recruitment in the industry over the short to medium term is quite positive. According to the responses given by participants in the survey the recruitment of apprentices in the industry should increase over the next 3 years, given that more than a quarter (27%) of firms currently training apprentices expect to increase their recruitment compared with about 10% who expect to reduce their recruitment.

Additionally, most of those firms currently not employing apprentices would be likely to consider taking on an apprentice if their business prospects improved. For both those currently training apprentices and those not, the offering of further financial incentives did not appear to be a significant issue. Current trainers did not perceive financial incentives as failing to cover their costs, while only about 13% of non-trainers rated increasing financial incentives as an incentive to take on apprentices in the future. Nevertheless a more targeted incentive regime aimed at new and prospective employers may have dividends in the immediate future as about one in five trainers (19%) think apprentices 'cost you money'.

Clearly then the increase in apprentice intake in the industry will be determined by economic conditions over the next three, however the trend is likely to be positive.

The survey reveals a useful distinction between 'traditional' trainers, that is those firms that have been regularly employing apprentices for many years, and 'recent' trainers – those that have employed apprentices only within the last three years.

Recent trainers seemed to be more likely to be motivated by economic and labour market reasons. They were concerned to see their labour supply maintained, although about a quarter of recent trainers were also keen to put something back into the industry. The traditional trainers appeared to be motivated quite strongly by what might be called altruistic reasons in addition to labour market needs. They wanted to put something back into the industry and to preserve their enterprise's traditions in training tradespersons. Their longer experience may have given these employers a better appreciation of the returns to investment reaped by the enterprise (and the industry) over time as well as the benefits of apprenticeships in ensuring a supply of skilled labour**.** Certainly larger employers were more likely to think they got better skilled workers by employing apprentices (10%) than the micro-businesses (5%).

Firms not currently employing apprentices, but which had previously had apprentices, identified a lack of work as the main barrier to taking on apprentices. An increase in the demand for their services was identified as the best incentive to take on an apprentice.

The over riding issue of the economic and business cycle is a more intractable problem but is one that may be partly overcome by multiskilling between traditional electrotechnology trades with New Apprenticeships or even between trades so as to mitigate the effects of seasonal and cyclical down turns on apprentices. Such an approach would facilitate movement in and out of the sector to other contract opportunities.

Firm size also correlates highly with the capacity and willingness of employers to take on apprentices**,** with larger firms more likely to directly employ apprentices. Less than a half (46%) of micro businesses (2-5 employees) employed an apprentice, compared with over three quarters (78%) of medium and nearly 90% of larger firms. The role and extent of group training companies should be examined to see if there is greater capacity to assist small and medium size firms to employ apprentices in the electrotechnology sector. Currently only 14%of micro businesses use group training companies compared to a third (43%) of larger businesses.

Many of the barriers to and perceived disadvantages in employing apprentices seemed to be related to the youthfulness and lack of skills and experience of apprentices and the associated problem that their management cost the employer skilled staff resources.

It was also apparent that most tradesmen involved in managing apprentices have not had any specific training in this role. Most employers regarded such training as unnecessary, often on the basis that the tradesmen had been apprentices once themselves. The survey found, for example, that three-quarters of those firms that did have regular meetings with their apprentices to review their progress had tradesmen trained in managing apprentices. It does seem therefore that such training has a positive impact on training practices.

The survey results also suggest that most survey respondents had limited procedures for reviewing the progress of their apprentices. It is likely that improved levels of support for apprentice supervisors in the area managing apprentices and other training in the industry would improve the ability of supervising tradesmen to relate to young people and provide specific skills in reviewing progress.

The survey found that trainees were virtually unknown in the industry, with more than half of the trainees employed in the surveyed firms all employed in just one firm. There would seem to be a need to investigate whether New Apprenticeships can be extended into the industry into areas not currently covered by traditional apprenticeships.

3.2 Characteristics of firms in the Electrotechnology Industry

Firm size and trainer type

The most striking feature of the industry is the high proportion of small firms within it. One in five (20%) businesses are sole traders and almost half (46%) had between 2-5 employees (see Table 1) at the site where the survey was conducted. Only one in ten businesses (10%) had 20 or more employees.

Also from Table 1 it can be seen that about half of all businesses surveyed have been classified as non trainers (49%), that is they do not currently employ an apprentice. About four in ten (41%) are traditional trainers and one in ten (10%) are considered recent trainers.

Traditionally, when an analysis is undertaken by firm size, the categories are defined as small (1-19 employees), medium (20-49 employees) and large (100 plus employees). However, given the structure of the electrotechnology industry an analysis has been undertaken which defines businesses in the following way:

- Sole trader (1 person business)
- Micro businesses (2-5 employees)
- Medium businesses (6-19 employees)
- Large businesses (20 employees or more)

Table 1 Size of firms within the electrotechnology industry by trainer type

	Traditional trainers %	Recent trainers %	Non-trainer %	All Businesses %
sole trader (1)			41	20
micro business (2-5)	37	63	48	46
medium (6-19)	42	29	9	25
large (20+)	20	8	2	10
Total	41	10	49	100

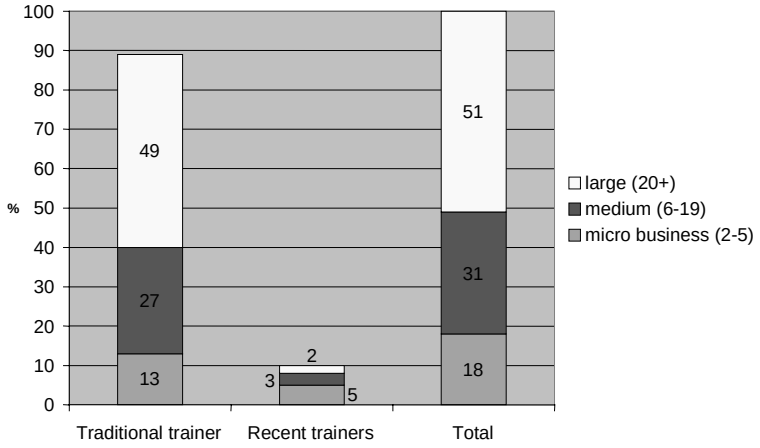
Non trainers are predominantly very small businesses. Almost nine out of every ten (88%) are either sole traders or businesses with less than 5 employees. On the other hand traditional trainers are characterised by a more even spread of firm sizes. About a third (37%) are micro-businesses, more than a third (42%) are medium sized business and 20% are large businesses. Recent trainers are quite different again and lie somewhere between the non-trainers and traditional trainers. Nearly two thirds are micro-businesses (63%), almost a third (29%) are medium sized businesses and less than one in ten (8%) are large businesses.

Firms employing apprentices

Business size is the single biggest determinate of apprentice employment. The biggest employers of apprentices are the larger sized firms. Figure 1 indicates that 51% of apprentices are employed in firms who have 20 or more employees even though these firms comprise only 10% of all businesses within the industry. The next largest employer of apprentices is firms with 6-19 employees (medium) who account for about a third of employment (31%). These firms represent approximately a quarter of all businesses in the industry. Micro-businesses, while accounting for almost half of all businesses in the industry employ only 18% of the apprentices.

The difference in the size of the businesses has direct implications for the employment of apprentices. Traditional trainers, which are made up of relatively high numbers of medium and large business, are responsible for employing 89% of apprentices. Recent trainers employ only 11 % of apprentices within the industry.

Figure 1: Apprentice employment by trainer type and size of business



Just over a third of businesses (37%) within the survey employed an apprentice directly and almost a fifth (18%) hosted an apprentice through a group training company. Combining these two types of apprentice employment shows that 48% of businesses within the industry currently have an apprentice.

As can be seen from Table 2 below smaller firms are less likely to employ an apprentice than larger firms. Less than half (46%) the micro businesses employed an apprentice compared to over three quarters (78%) of medium and nearly 90% of large firms.

Table 2 Firms that employ/host at least one apprentice by firm size and trainer type

	Employs Apprentice directly %	Hosts an apprentice through a GTC %	Employs/hosts an apprentice of any kind %
micro business (2-5)	34	14	46
medium (6-19)	62	29	78
large (20+)	69	43	86
Traditional trainers	76	36	98
Recent trainers	69	31	94
Total	37	18	48

Fewer than 14% of firms in the 2-5 size group were hosts to GTC apprentices, a surprising result given that one of the aims of GTCs is to facilitate participation in the apprenticeship system by small enterprises. In fact Table 2 shows clearly that the bigger the company the more likely they are to utilise GTCs.

The role of group training companies in providing continuity of employment and training to apprentices and to assisting employers to overcome difficulties experienced with administrative, legislative and supervisory responsibility for apprentices is evident in the industry.

The predominance of medium size and large firms use of GTCs is further evidence in the success of the scheme in attracting employers. Nevertheless, further strategies are needed to attract smaller employers to GTCs given their overall dominance of the sector. The capacity of sole traders to recruit apprentices even with the assistance of GTCs is in some doubt given their predominance among non-trainers. However, there is likely to be considerable potential among micro employers and it is suggested that this area be looked as a priority by industry, government and GTC.

Table 3 Ratio of apprentices to employees by size of business and trainer type at survey location

Business Size (number of employees) and Trainer Type	Ratio	Proportion of total employment %
sole traders	n.a.	2
micro (2-5)	0.35	12
medium (6-19)	0.22	19
large (20+)	0.1	68
Traditional Trainer	0.29	71
Recent Trainer	0.26	11
Non-Trainers	n.a.	18

Apprentices comprise a considerable proportion of the workforce employed by micro and medium-sized firms. Approximately one in three micro business employees is an apprentice compared to one in five among medium-sized and one in ten in larger firms (see Table 3). In addition, micro and medium sized firms employ a disproportionately larger share of apprentices than large firms when the total employment of firms is analysed. Medium sized businesses employ nearly a third of all apprentices in the sector but account for only 19% of total employment. Similarly, micro businesses employ 18% of apprentices but account only 12% of total employment in the sector. Large firms on the other hand employ half of all apprentices but account for over two thirds (68%) of all employment in the sector

These findings show that apprentices contribute to a large extent to commercial outcomes of smaller businesses in the electrotechnology sector and are a more important source of labour. It also indicates that for smaller businesses the decision to employ an apprentice and the choice of the right candidate is more likely to be of much higher importance than for larger firms. In addition, smaller businesses are more likely to be affected by changes to apprentice numbers or modifications to the apprenticeship system.

Table 4 Number of apprentices by size of firm and trainer type

	1 %	2 %	3-5 %	6 + %
micro business (2-5)	80	18	2	
medium (6-19)	33	34	31	2
large (20+)	11	6	30	53
Traditional trainers	43	24	21	12
Recent trainers	74	16	8	2
Total	49	22	19	10

Apprentices tend to be employed in small numbers within firms with half (49%) the trainers employing only one apprentice with another quarter (22%) employing 2 apprentices. Only 10% of trainers employed more than 5 apprentices.

As would be expected, larger firms were more likely to employ more then 5 apprentices than smaller firms. Like wise, traditional trainers were also more likely than recent trainers to employ more than 5 apprentices. This is not unexpected given there is a higher proportion of larger firms within the traditional trainer group.

Very few firms employed trainees with only 8% reporting this in the survey. Again it was the larger firms that were more likely to employ trainees with almost a quarter (22%) of large businesses and one in ten (10%) medium sized businesses doing so. The total number of trainees employed were split fairly evenly between the large and medium sized firms. Trainees were virtually non existent within micro- businesses.

Traditional (12%) and recent trainers (13%) were as likely as each other to employ a trainee. Although traditional trainers accounted for nearly nine out of every ten (87%) employed. No information was provided on the nature of the traineeships undertaken by these trainees which makes further conclusions about them more difficult.

Market sectors in which firms operate

A Major characteristic of the industry is that firms of all sizes tend to work in a number of different sectors and undertake quite different types of work.

As can be seen from Table 5, 83% of firms operated in the commercial sector, while about two-thirds operated in the residential (68%) and industrial sectors (65%). Only a third operated within the retail sector (32%). This is generally true for firms of all sizes however there are some differences. Sole traders tended to be more concentrated in the residential sector than other sized firms and less so in

the industrial sector. Non trainers were also slightly more likely to work in the residential sector than were traditional or recent trainers. This is not surprising given that over a third of non-trainers are sole traders. The residential sector is more volatile than the other sectors. This uncertainty would make work planning more difficult and presumably make it more difficult to commit to long term employment associated with apprentices.

Table 5 Market sectors within which firms operate

	Residential	Commercial	Industrial	Retail	Other
	%	%	%	%	%
sole trader (1)	85	78	57	28	2
micro business (2-5)	75	85	65	32	1
medium (6-19)	56	85	67	33	1
large (20+)	33	81	76	37	4
Traditional trainers	63	88	70	36	1
Recent trainers	68	88	65	39	3
Non trainers	73	79	61	28	1
Total	68	83	65	32	2

N.B. Multiple responses mean percentage total more than 100

In addition to their market sector, firms were asked to describe the type of work they undertook. The next table shows the type of work that surveyed firms reported undertaking.

Table 6 Type of work undertaken size of firm and trainer type

	Voice and data	Light and and power	Security	Fire evacuation	Air conditioning	Building automation
	%	%	%	%	%	%
sole trader (1)	29	95	25	13	37	20
micro business (2-5)	43	90	33	16	39	33
medium (6-19)	54	84	36	23	40	42
large (20+)	58	77	41	34	32	48
Traditional trainers	55	89	39	24	42	44
Recent trainers	44	89	33	21	41	31
Non trainers	35	88	28	14	35	27
Total	45	88	33	19	38	34

N.B. Multiple responses mean percentage total more than 100

Again firms tended to undertake a range of different types of work. Almost 90% of firms were involved in light and power, although a relatively large proportion also operated in the areas of voice and data (45%) and air conditioning/refrigeration (38%). About one third operated in the security and building automation areas. This was generally true of all businesses regardless of their size or whether they trained apprentices or not.

However, there were some difference in the type of firms undertaking voice and data and building automation work. Sole traders (29%) and to a lesser extent micro-businesses (43%) were less likely to participate in these areas than larger businesses. Non-trainers (35%) were also less likely to work in voice and data than trainers of any type.

3.3 Industry Structure

Work contracts within the industry

The electrotechnology industry is one where businesses mainly engage in short term contracts (53%) or small ad-hoc jobs (52%). Long-term contracts are relatively uncommon in the industry with only a quarter of firms mainly engaging in this form of work contract. Sole traders (10%), micro businesses (20%) and non-trainers (17%) were even less likely to engage in long term contracts then other businesses and as a result would have to contend with a more volatile working environment. The more volatile working environment would generate greater business uncertainly, which would not be conducive to long term employment contracts such as an apprenticeship.

Table 7 Type of work contracts by size of firm and trainer type

	Mainly long term %	Mainly short term %	Small ad hoc jobs %	Other %
sole trader (1)	10	49	64	4
micro business (2-5)	20	61	54	5
medium (6-19)	37	49	46	7
large (20+)	54	37	38	7
Traditional trainers	33	53	47	6
Recent trainers	30	63	55	2
Non trainers	17	52	56	6
Total	25	53	52	6

N.B. Multiple responses mean percentage total more than 100

Use of sub contractors

The use of sub-contractors within the industry is widespread with two thirds of firms making use of this form of labour hire. Micro-businesses were more likely to use sub-contracted labour then other sized firms, while traditional trainers are less likely than both recent and non-trainers.

About two-thirds of firms employing apprentices also were in the habit of using sub-contractors from within the industry to help complete jobs. Most identified the need for highly skilled workers as the reason for using sub-contractors (Fig. 2). However, these employers also consider the flexibility of the working arrangement when deciding whether or not to engage a sub-contractor. For policy makers this is important as it opens up an opportunity to increase the use of apprentices by enhancing the role of group training companies which are able to offer the desired flexibility. When non-trainers were asked why they use sub-contracted tradesmen rather than apprentices the aspect of flexibility was nearly as important to them as the issue of skills (Fig. 3). This finding further underlines the role that group training companies may able to play in increasing apprentice numbers in the electrotechnology industry.

Table 8 Use of sub-contractors by size of firm and trainer type

	Firm currently using sub-contractors %
sole trader (1)	67
micro business (2-5)	74
medium (6-19)	66
large (20+)	59
Traditional trainers	64
Recent trainers	73
Non trainers	70
Total	68

Figure 2: Most trainers that use sub-contractors instead of apprentices do so because they require highly skilled workers; N = 372; multiple responses mean percentages total more than 100

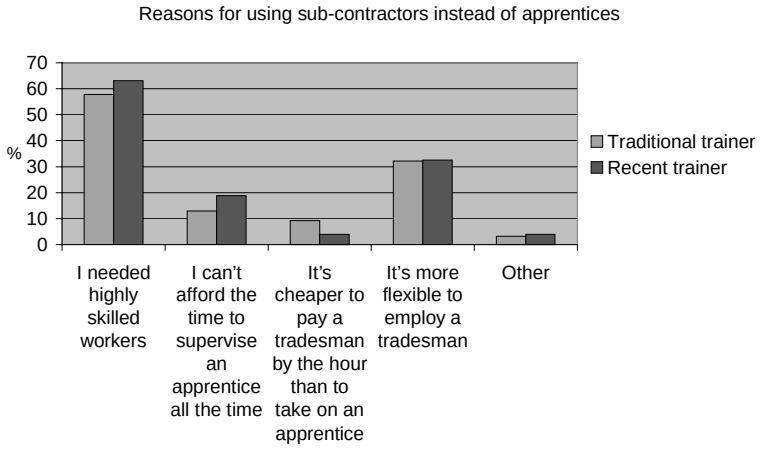
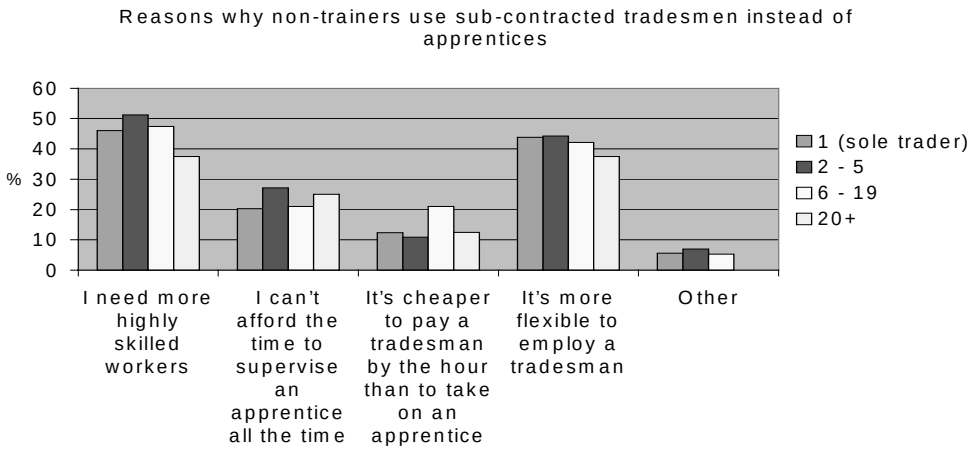


Figure 3: When non-trainers decide whether to use a sub-contracted tradesmen or an apprentice flexibility of the arrangement is nearly as important as skills; N = 245; multiple responses mean percentages total more than 100



Age and industry experience

The average age of the survey respondents was 45 years. The average age of respondents within the different sized businesses was close to this average. Recent trainers were on average a younger (40 years) group of respondents than both traditional (46 years) and non-trainers (46 years). It is one of the few areas where traditional trainers are actually similar to non-trainers. It also highlights an important point. It indicates that on average recent trainers are only becoming trainers after they have had a reasonable level of experience within the industry. Most recent trainers are joining the trainer ranks in their mid-thirties.

This is reinforced when you consider the time the different groups have spent in the industry. Again there is very little difference between the average time spent in the industry by the different sized firms. The only differences are that sole traders (28 years) have slightly more experience than all other businesses and, recent trainers (20 years) have less experience than both traditional (27 years) and non-trainers (27 years).

What this shows in that non-trainers have probably already made up their mind to be just that non-trainers. Given their age it is unlikely that many of this group will have the motivation, energy and/or dedication required to suddenly create a business that will grow to a size that is likely to employ apprentices. It appears that if non-trainers have not formed a reasonably sized business by the age of forty then they are probably unlikely to do so ever.

Table 9 Average age and time spent in industry by size of firm and trainer type

	Age (average) %	Time spent in industry (average) %
sole trader (1)	47	28
micro business (2-5)	44	25
medium (6-19)	44	25
large (20+)	46	25
Traditional trainers	46	27
Recent trainers	40	20
Non trainers	46	27
Total (Average)	45	25

Recent trainers are relatively young, have good experience and the motivation to take on the higher level managerial tasks required of apprenticeship employment. They are probably the more dynamic cohort of the tradesmen group. In fact, it would be interesting to know how much time recent trainers spend on their own or in a business without an apprentice, before they decide to take on an apprentice. This information was not obtained in the survey.

An analysis was undertaken of the survey data by State, where sample size permitted. Generally there were few differences between States on most of the key items. Two differences that did emerge were that trainers within Western Australia were more likely to use group training companies than other States, and firms within New South Wales were more likely to use the services of sub contractors than other States.

3.4 Firms currently employing apprentices

The following section looks at the specific views of current trainers within the industry as to why they employ apprentices and the perceived advantages and disadvantages of doing so. It also looks at the differences and similarities in views expressed by both recent and traditional trainers. Past and future recruitment patterns are briefly investigated as well as trainers preferred method of training and how they manage their existing apprentices.

Reasons for employing apprentices

Traditional and recent trainers were asked similar but slightly different questions around the reasons they take on apprentices. Recent trainers were asked why they had recently decided to take on an apprentice while traditional trainers were asked why they customarily take on apprentices. Although the questions were phrased differently they are close enough for comparison purposes.

Firstly, there were a number of similarities between the two groups of trainers. The reasons given by trainers can be categorised into two types of responses, more hard-edged economic/labour market reasons and the more altruistic reasons that are detailed below:

- **Economic/labour market**
  - Cost effective source of labour
  - to increase labour supply
  - can train them in the company way
  - it's a away of replacing tradesmen that leave
  - I need the help
- **Altruistic**
  - To put something back into the industry
  - I was approached by a young person or family member
  - Give young kids a chance/job

The economic/labour market reasons were cited most often by all trainers and would appear to be the more important. While the more altruistic reasons are still fairly significant it should be noted that trainers are able to be 'altruistic' if they the financial capacity to take on employers in the first place.

Table 10 Recent trainers - reasons for employing apprentices by size of firm

	Micro business (2-5)	Medium (6-19)	large (20+)	Total
	%	%	%	%
Economic/Labour market				
To increase my labour supply	55	46	60	53
Can train them in our own way	20	21	0	19
It's a cost effective source of labour	8	20	13	12
To bring new ideas to the business	1	3	0	2
Altruistic/other				
To put something back into the industry	23	26	53	27
I was approached by a young person or their relative	7	3	7	6
Family member	5	0	0	3
I was approached by a GTC	1	0	0	1
Other	7	12	7	9

Within traditional trainers the larger firms are more likely to employ apprentices as a way of replacing tradesmen that leave (32%) and to put something back into the industry (43%). Smaller firms are more likely to report they need the help (37%).

There are some significant differences between the reasons given by recent and traditional trainers. The most common reasons given by recent trainers for taking on an apprentice were predominantly related to economic/labour market conditions. Specifically, recent trainers wanted to:

- increase their labour supply (53%)
- to train apprentices in their own way (19%)
- a cost-effective source of labour (12%)

Over a quarter of recent trainers (27%) also mentioned altruistic reasons namely to "put something back into the industry."

The traditional trainers' most frequently given reasons for employing apprentices were nearly equally divided between "It allows us to train workers in the company way" and "It lets me put something back into the industry." The need for additional labour, in this question expressed as "It's a way of replacing tradesmen that leave" was much less significant a reason in comparison with recent trainers, representing less than 20% of the reasons given by traditional trainers.

Table 11 Traditional trainers - Reasons for employing apprentices by size of firm

	Micro business (2-5) %	Medium (6-19) %	Large (20+) %	Total %
Economic/labour market				
It allows us to train workers in the company way	33	39	39	37
It's a way of replacing tradesmen that leave	6	22	32	19
I needed the help	37	14	9	20
They are a cost effective source of labour	14	16	12	14
It's the way we've always done things	4	10	7	7
Altruistic/other				
It lets me put something back into the industry	31	34	43	36
Give young kids a chance/job	19	11	9	13
I get approached by a potential appr or GTC	2	0	0	1
Other	2	4	3	3

Benefits of employing an apprentice

The traditional and recent trainers were asked about the benefits of employing apprentices. Employers saw three different types of benefits that flowed from employing apprentices. The benefits were focussed on:

- Economic factors
- Quality of training
- Other, usually altruistic factors

The economic and quality of training issues appear to be of roughly equal importance with over half of trainers citing these advantages (see Table below).

Table 12 Main benefit of taking on an apprentice by size of firm

	Micro business (2-5)	Medium (6-19)	Large (20+)	Total
	%	%	%	%
Economic				
Cost effective source of labour	24	22	22	23
Ongoing invest in the business	15	15	25	17
Help with workload	18	7	4	11
Cheaper to hire an apprentice	7	9	8	8
Quality of training				
I get to train them to suit the way I work	41	55	46	47
You get better skilled workers	5	12	10	8
It produces employees loyal to the company	10	10	19	12
Altruistic/other				
Put something back into the industry	12	13	17	14
Give kids a chance	6	8	8	7

Tailoring training to suit the business was the single most important reason. There was a greater number of different economic reasons with nearly a third (31%) reporting that apprentices were a more cost effective/cheaper source of labour. Being able to put something back into the industry (14%), to give kids a chance (7%) and the ability to develop greater loyalty to the company (12%), were also seen as important advantages.

There were some differences by firm size. Large businesses were more inclined to view apprentices as an on-going investment in the business and as a way of developing loyal employees within the business. They were also more likely to be more altruistic in that they saw apprenticeship employment as putting something back into the industry. Micro businesses on the other hand were more likely to see the more immediate advantages of apprentices. They saw the easing of their workload as relatively more important.

Traditional and recent trainers viewed the benefits of apprenticeship employment in a similar way. Traditional trainers seemed to have a slightly longer term view of apprentice employment and were and were more likely (20%) than recent trainers to (12%) to see apprentices as an ongoing investment in the business. Recent trainers were a little more focussed on the more immediate benefits with more (16%) citing help with their workload than traditional trainers (8%).

Table 13 Main benefit of taking on an apprentice by trainer type

	Traditional Trainer %	Recent Trainers %	Total
Economic			
Cost effective source of labour	20	27	23
Help with workload	8	16	11
Ongoing invest in the business	20	12	17
Cheaper to hire an apprentice	7	10	8
Quality of training			
I get to train them to suit the way I work	46	48	47
It produces employees loyal to the company	14	9	12
You get better skilled workers	9	7	8
Altruistic/other			
Put something back into the industry	13	14	17

Disadvantages of employing an apprentice

When asked to identify the main disadvantages of employing apprentices the reasons given were more diverse, with no one response making up a quarter of the total. The next table provides details of the responses to this question.

While the reasons given are diverse the responses do seem to be related, with apprentices' lack of skills and their need for supervision obviously related. Again the requirement for supervision clearly means additional labour costs are incurred in this supervision, hence the sizeable response to the reason "They cost you money".

This cluster of reasons relating to the youth and inexperience of apprentices was clearly more significant a disadvantage than reasons relating to bureaucratic matters such as the paperwork required with recruiting an apprentice or any failure of financial incentives to cover the costs of apprentices. It also appears that employers in the electro-technology sector have no major concerns with the relevance of the off-the-job training in TAFE to their job-related needs. The long term duration of an apprenticeship also did not feature as a major disadvantage.

The responses to the issue of apprentice disadvantages were almost identical when analysed by firm size. The only real difference of note was that smaller businesses, especially micro businesses (28%) were far more likely to report supervision requirements as an issue than large businesses.

These findings suggest that any policy initiatives directed at increasing the recruitment of apprentices into the industry need to be directed at supporting apprentices and their employers in the on-the-job component of their training. Evidence presented elsewhere in this paper shows that the supervisors of apprentices are unlikely to have had any training in the delivery of training on-the-job. While this is a problem that is widespread throughout many industries - at least 25% of VET practitioners possess no post-school qualifications.

Table 14 Main disadvantages of apprentices by firm size

	Micro business (2-5) %	Medium (6-19) %	Large (20+) %	Total %
Time apprentice spends away from work at TAFE/Tech	16	16	19	17
They take a lot of supervision	28	22	12	23
Apprentices do not have skills in early years to be of much use	26	22	23	24
They cost you money	21	15	23	19
They might leave at end of training	5	4	5	4
They are young and irresponsible	17	19	15	17
Financial incentives do not cover the costs	5	4		3
Paperwork associated with taking one on	5	3	1	3
Insufficient work	7	7	6	7
Long term commitment	2	6	4	4
No disadvantage	12	13	22	15

It would seem that one obvious way to address the concern over lack of skills and the associated problems of supervisory costs and time could in part be through the development of updated versions of the former pre-apprenticeship programs that have operated in some apprenticeship areas in the past. This approach would aim to provide some basic skills before the apprentice arrived in the workplace.

VET in schools is another area worth investigating. While the number of students undertaking VET in schools generally is increasing, a more targeted increase in the numbers undertaking specific electrotechnology related subjects would benefit the skill formation in students before commencement of an apprenticeship.

Table 15 Main disadvantages of apprentices by trainer type

	Traditional trainer %	Recent trainers %	Total
Time apprentice spends away from work at TAFE/Tech	17	17	17
They take a lot of supervision	18	29	23
Apprentices do not have skills in early years to be of much use	22	28	24
They cost you money	20	19	19
They might leave at end of training	5	3	4
They are young and irresponsible	20	14	17
Financial incentives do not cover the costs	3	3	3
Paperwork associated with taking one on	2	4	3
Insufficient work	7	6	7
Long term commitment	4	4	4
No disadvantage	14	16	15

Changes in apprentice recruitment

Trainers were questioned in relation to their recent history of apprentice recruitment. The question posed was "In the *past* 3 years have you increased, maintained or decreased the number of apprentices you have taken on?" Most commonly traditional trainers had maintained recruitment at a constant level, although a significant minority, almost a third, had actually increased their recruitment over recent years. Only a small proportion of traditional trainers, around 10%, had reduced their recruitment of apprentices over the last 3 years. Recent trainers also appear to have increased their recruitment activity (18%) over recent times, albeit

less so than traditional trainers. Recent trainers were also more likely to report they had reduced there level of recruitment (27%) than traditional trainers.

There were quite marked differences by firm size. The big employers of apprentices namely medium and large firms, reported much greater increases in recruitment activity with large firms (42%) reporting twice as much recruitment activity as smaller firms (21%). This finding coincides with strong employment growth reported in statistical collections over the past three years.

Table 16 Recent changes in apprenticeship recruitment by size of firm and trainer type

	Increase %	Decrease %	Maintain %
micro business (2-5)	21	9	70
medium (6-19)	36	12	52
large (20+)	42	11	46
Traditional trainers	33	10	57
Recent trainers	18	27	55
Total	32	11	57

Trainers were also asked about their future recruitment of apprentices.

Almost 60% of all trainers expecting to maintain their current levels of apprentice recruitment. Only 10% of all trainers expected their recruitment of apprentices to decline over the coming 3 years, while over a quarter (27%) expected an increase. Businesses of different sizes expected similar patterns of recruitment to apply in the future to those noted above.

Interestingly recent trainers (42%) were far more positive in their outlook than their traditional counter parts (18%). Traditional trainers (63%) were more likely to think the recruitment of apprentices would be maintained at there current levels than recent trainers (45%). Given that traditional trainers account for over 80% of apprentice employment their actions will determine the extent of future apprentice employment and while the outlook of this group is positive it appears to be less positive than in the previous three years. This would indicate that the level of recruitment will increase but the increase will be at a lower rate than has recently been experienced in the industry.

Table 17 Outlook for apprenticeship recruitment by size of firm and trainer type

	Increase %	Decrease %	Maintain %
micro business (2-5)	29	11	51
medium (6-19)	28	9	56
large (20+)	21	9	64
Traditional trainers	18	12	63
Recent trainers	42	5	45
Total	27	10	56

Preferred mode of apprentice training

Current employers of apprentices of were asked to identify their preferred mode of apprentice training, given the following options:

- Block release
- One day at TAFE, four days at work

- Totally on the job
- Other (please specify)

Clearly the traditional pattern of one day a week at TAFE remains the preferred model for apprentice training among employers in this industry. This preference was maintained by all firms regardless of size. There was a slight preference among smaller firms for totally on-the-job training, however in no size group was this approach favoured by more than 18% of firms.

Table 18 Preferred method of training by size of firm and trainer type

	One day at TAFE 4 days at work	Totally on the job	Block release	Other
	%	%	%	%
micro business (2-5)	58	18	22	2
medium (6-19)	61	14	23	2
large (20+)	56	12	30	3
Traditional trainers	58	14	27	2
Recent trainers	60	18	19	3
Total	59	15	24	2

Managing apprentices' training

Employers of apprentices were asked a series of questions about how they managed the training of their apprentices.

Perhaps the most significant finding was that only about 15% of businesses reported that their tradesmen had received training in how to manage apprentices. Earlier it was noted that the main disadvantage of employing apprentices was seen to be the age and inexperience of apprentices, and other factors associated with their youth. This lack of training in dealing with young adults is likely to be a major contributing factor to perceptions of problems in employing apprentices.

Larger sized firms with 20 or more employees were slightly more likely to have tradesmen trained in managing apprentices, with 17% of firms in this category reporting trained tradesmen. The following table shows the percentage of firms that offer training to tradesmen in managing apprentices, by the size of the firm and trainer type.

Table 19 Proportion of businesses that currently offer training to tradesmen in managing apprentices

	%
micro business (2-5)	12
medium (6-9)	16
large (20+)	17
Traditional trainers	16
Recent trainers	13
Total	15

Of those firms which currently employ apprentices only about 11% had accredited workplace trainers. Accredited workplace trainers were most likely to be found in larger firms. Half the firms surveyed who did not have tradesmen trained in managing apprentices believed that

training them to manage apprentices was not necessary. A further 11% said that the tradesmen were apprentices themselves once. Sixteen percent of respondents said they were unaware that such training was available.

Most firms, almost 90%, reported that they regularly circulated their apprentices among different tradesmen. As would be expected rotation was less likely to occur in the smallest firms (those in the 2-5 size range). A smaller proportion of firms, about 80%, reported having regular meetings or discussions with their tradesmen on the progress of apprentices. A similar proportion again, reported having regular meetings or discussions directly with their apprentices. Nearly three-quarters of the firms who had regular meetings with their apprentices had tradesmen trained in managing apprentices. This finding suggests that such training has a positive impact on the management of apprentices.

3.5 Firms not currently employing apprentices

This final section concentrates on the non-trainers, that is, those employers that do not currently employ an apprentice directly or host an apprentice through a group training company. It investigates why non-trainers do not currently have an apprentice and what might influence them to take on an apprentice in the future. The non-trainers are also segmented into two groups, those that have never employed an apprentice before and those that have.

Reasons for not employing apprentices

Almost half (49%) of the firms surveyed were classified as non-trainers. More than half of this group, nearly 58%, had however either directly employed apprentices in the past or had hosted apprentices from a group training company.

Just over 40% of firms not currently employing apprentices had never employed or hosted apprentices. Of this total, 37% were sole traders or micro-businesses.

These firms were asked to provide their reasons for never employing apprentices. Given the size of these firms the results were predictable and are shown in the following table.

Table 20 Firms who have never employed an apprentice - reasons for not employing an apprentice by size of firm

	sole trader (1)	micro business (2-5)	medium (6-19)	large (20+)	total
	%	%	%	%	%
They cost too much	17	16	0	0	14
Too much commitment	15	16	9	0	14
Too much paper work	6	2	0	0	4
I just want to stay small	33	12	0	0	22
The nature of the work	30	37	64	57	37
I've never thought of it	6	8	0	0	6
Tradesmen are more cost effective	1	12	0	0	5
Insufficient work	15	18	9	0	15
Other	6	6	18	57	10

Almost 60% of the reasons fell into two categories, both of which suggest that trying to persuade these firms to take on apprentices would be challenging. The largest category, "The nature of the work" was the only reason given by larger firms, although small firms were most prevalent in this and all other categories. Moreover, those areas more readily addressable by government policy initiatives, such as "too much paper work" or "I've never thought of it" only accounted for around 10% of all reasons given.

These firms were also asked whether they had ever considered taking on an apprentice and

whether there was any future situation in which they might consider doing this. Nearly half said yes to both these questions, suggesting that there might be some prospect of increasing apprentice numbers among this group. About a quarter said no to both questions. Those who had never thought of putting on an apprentice were less likely to imagine a future situation under which they might employ an apprentice. Only about 13% of those who had never considered taking on an apprentice could imagine a future situation under which they might employ them.

Of the firms who had employed apprentices in the past but were not currently employing them the most common reason was a lack of work for them. The second most common reason was the nature of the work. Again the main reasons are not easily addressed by policy initiatives.

Table 21 Previous employers of apprentices - reasons for not employing an apprentice now by size of firm

	sole trader (1)	micro business (2-5)	medium (6-19)	large (20+)	total
	%	%	%	%	%
I wasn't happy with the GTC	2	4	4	0	3
They cost too much	13	19	13	0	16
Too much commitment	15	11	13	33	12
Too much paper work	6			0	2
I just want to stay small	22	5	9	0	10
The nature of the work	19	19	26	67	20
Tradesmen are more cost effective	0	1	4	0	1
Due to retire/Too old	15	6	4	0	8
Attitude problems/unreliable/lack of commitment/motivation	7	17	9	33	14
Not enough work for them	28	30	26	0	29
Other	2	14	17	33	11

Most of the firms in this category, about 60% had only directly employed apprentices, rather than through GTCs. Another 20% or so had both directly employed apprentices and hosted apprentices through a GTC. The 'nature of the work' more than likely relates to the need for highly skilled labour with most of the firms giving this reason were operating in the most common areas of light & power and voice & data.

Influences to employ an apprentice in future

Those who answered yes to whether there could be future situations under which they might employ apprentices were asked what issues might influence their decision. Overwhelmingly the factor that would influence this decision was whether their workload increased, with nearly 57% giving this reason. Other factors were of limited significance, as shown in the following table.

Access to a GTC did not seem to be an issue, nor again did paperwork associated with taking on an apprentice appear to be a deterrent, nor was the time taken off work by an apprentice a problem. Greater financial incentives appeared to be attractive to about one in eight respondents to this question.

The conclusion to be drawn from this analysis of firms not currently employing apprentices is that only increased demand for their services is likely to increase their employment of apprentices. The finding that only about 12% would be influenced by finding the right person is surprising, given other research undertaken into apprentice recruitment, (e.g. DETYA (1998) and DEWRSB (1998). These studies into apprenticeships in NSW and Victoria found that only

about 1 in 4 applicants for apprenticeship positions was judged suitable by the employer. The reasons for lack of suitability were mainly that applicants for apprenticeship positions lacked adequate vocational preparation and a positive attitude to further workplace learning.

Table 22 Influences to take on an apprentice by size of firm

	sole trader (1)	micro business (2-5)	medium (6-19)	large (20+)	total
	%	%	%	%	%
If employing an apprentice were easier	1	3	0	0	2
If I got more work	61	55	57	40	57
If I had access to a GTC	1	4	5	0	3
Simpler paper work	7	2	0	20	4
Greater financial incentives	13	13	14	0	13
If they did their training in their own time	1	1	0	0	1
If I found the right person/Someone with appropriate attitude	13	10	14	20	12
If business expands	9	4	10	20	7
If I had the right type of work	6	8	10	40	8
Other	4	11	0	0	7

It seems clear that many young applicants are judged not to be suitable for starting an apprenticeship on the basis of inadequate basic skills and their perceived attitude to work. Current trainers, past trainers and non-trainers all expressed variations on these themes as significant disadvantages in either employing apprentices or as a reason for not employing them. Policy responses to these concerns need to focus on examining the availability of pre-apprenticeship and related courses. Research should examine whether, when such courses exist, they represent a pathway into apprenticeships.

There is also clearly a concern that school is generally not providing an adequate preparation for apprenticeships for some young people. School-based vocational education courses should therefore be examined to determine whether any provide the range of basic vocational skills being sought by employers of apprentices. The industry should seek to influence school authorities to recognise the shortcomings of school curricula in meeting their expectations.

3.6 Employer attitudes toward training and employing apprentices

Employer Outlook

Firms were asked whether they thought they would increase or decrease the number of employees (not just apprentices) within the business over the next 12 months. Based on respondents answers the overall employment outlook was optimistic. Most of the firms surveyed, around two-thirds, expected their overall employment levels to remain about the same over the coming year. Nearly three times as many firms, 22% compared to 8%, expected an increase rather than a decrease in their employment level over the coming year. Larger size firms seemed more optimistic than the smallest firms in their predictions of employment growth. Similarly non-trainers were also less optimistic than both recent and traditional trainers. This is not unexpected given that smaller firms and non-trainers tend to operate in more volatile economic conditions than other types of business within the industry.

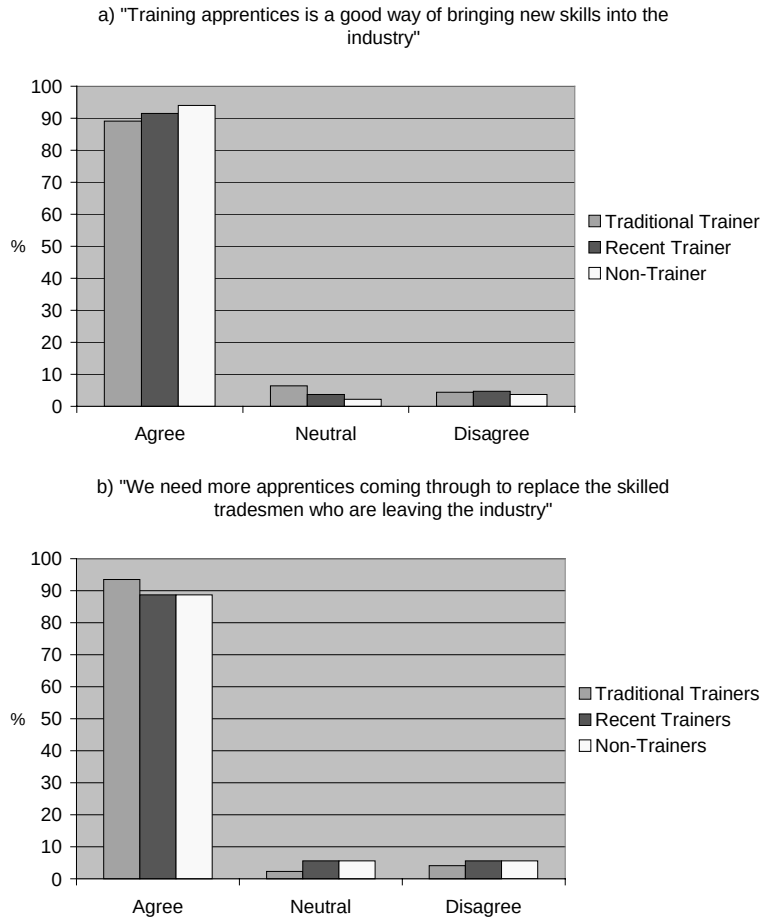
All employers were asked to respond to a range of statements to gauge their perceptions relating to apprentices in general and the apprenticeship system. The questions were the same for trainers and non-trainers alike.

Employer attitude toward apprentices

Overall, responses revealed a strong basic positive attitude towards apprentices and the existing apprenticeship system across the electrotechnology industry even among non-trainers. Respondents shared a strong belief that an increase in apprentice numbers is needed. Employers voiced little concern about systemic issues, instead the concerns raised related to the suitability of apprenticeship applicants and to factors that impact on the economic viability of an apprenticeship. While traditional trainers and recent trainers were mostly united in their response, differences in opinion were mainly found between trainers and non-trainers.

The industry's fundamental backing of apprenticeships is demonstrated in the respondent's strong united support for the views that training of apprentices is a good way of bringing new skills into the industry and that more apprentices are needed to replace skilled tradesmen who are leaving the industry (Fig. 4a and 4b). In line with this finding, more than two thirds of each respondent group voiced disagreement when presented with the statement that it would be better to train existing workers in the electrotechnology industry rather than to train more apprentices.

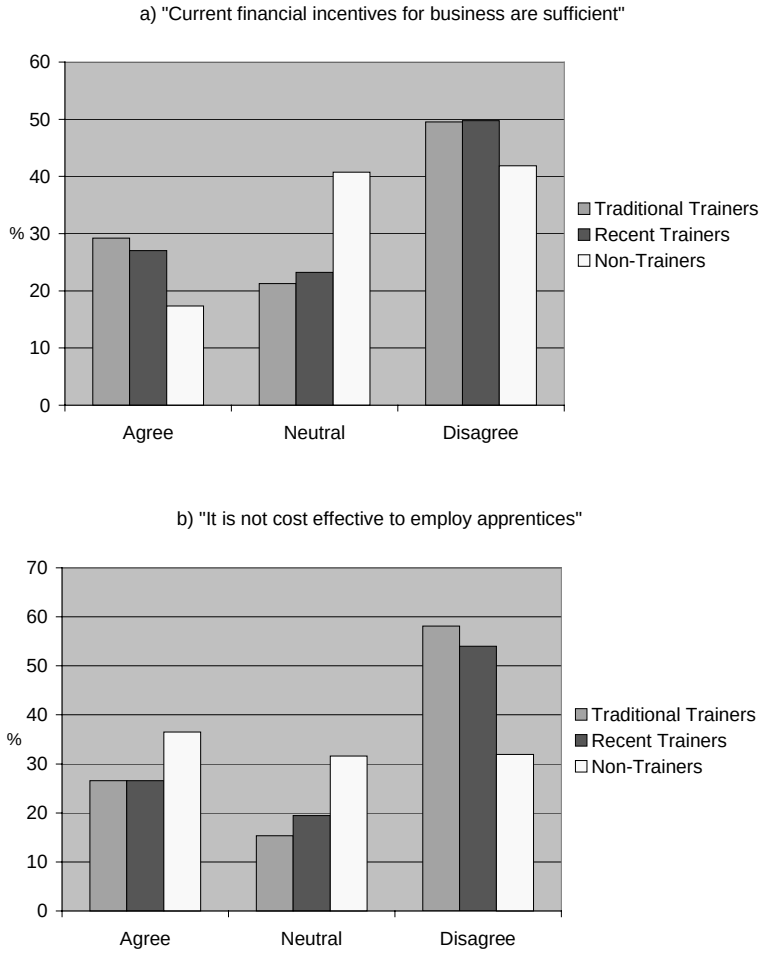
Figure 4: Employers in the electrotechnology industry fundamentally support apprenticeships and the apprenticeship system



Economic parameters play a paramount role in the decision-making process whether to employ an apprentice or not. Financial incentives offered under the current apprenticeship system are of particular significance for businesses. When presented with the statement that current financial incentives for business are sufficient, 50% of traditional and recent trainers and 42% of non-trainers disagreed with this view (Fig. 5a). It should be noted, however, that 41 % of non-trainers were neutral on this issue which may indicate a lack of clarity on this issue among this group.

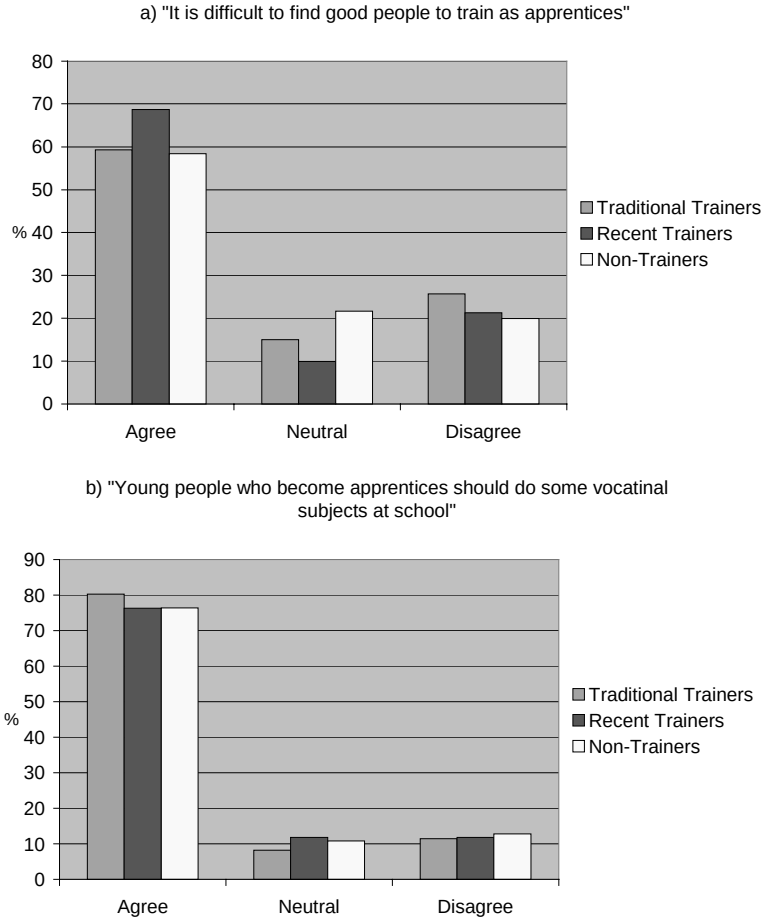
Despite the tendency of trainers to consider current financial incentives to be insufficient, 58 % of traditional trainers and 54% of recent trainers disagreed with the view that it is not cost effective to employ apprentices (Fig. 5b). Non-trainers were more divided on this issue with approximately one third of this group expressing agreement, another third stating disagreement and the remainder taking a neutral stance.

Figure 5: Trainers tend to consider financial incentives insufficient but still think it is cost-effective to employ apprentices



There is a concern among employers in the electrotechnology sector about the suitability of apprenticeship candidates. Survey respondents were strongly united in their support for the view that it is difficult to find good people to train as apprentices (Fig. 6a). This concern is also reflected in the finding that more than 75% of traditional, recent and non-trainers think that young people who become apprentices should do some vocational subjects at school (Fig. 6b).

Figure 6: Employers are concerned about the suitability of candidates for apprenticeships and believe that prospective apprentices should undertake vocational subjects at school



The concerns voiced by employers about the suitability of candidates clearly open a leverage for policy makers to stimulate the uptake of apprentices in this sector by addressing the perceived low quality of candidates. One option is to examine whether existing pre-apprenticeship arrangements are optimal to provide a supply of suitably qualified apprenticeship candidates. Alternatively, an examination of available school-based vocational education courses may be warranted to determine the level of industry involvement in curriculum content and whether there are pathways from these courses into either pre-apprenticeship or apprenticeship programs.

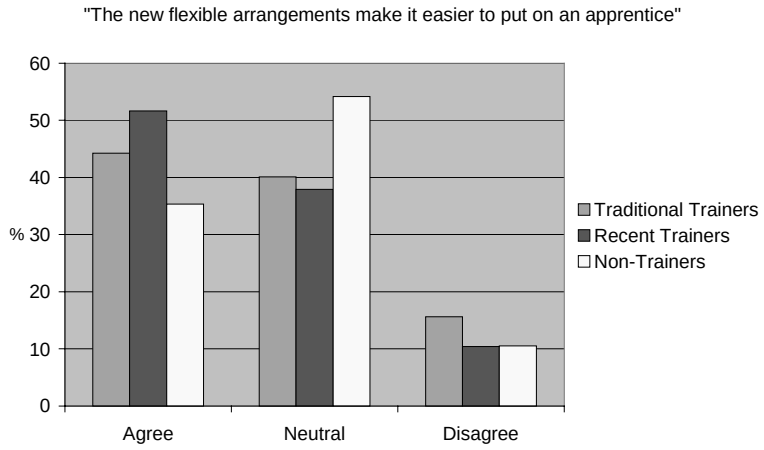
Factors that indirectly affect the economic viability of an apprenticeship include government administrative support, flexible employment arrangements, employment of apprentices through group training companies, and TAFE/TECH training of apprentices outside of working hours. These issues when probed through the survey did not elicited unanimous responses.

The issue of administrative support from government did not elicit a clear response from any of the three groups. Traditional trainers and recent trainers were approximately equally divided in support, non-support and neutral camps on this issue. Non-trainers, however, were more likely to voice a neutral stance on this view indicating a possible lack of knowledge on this issue.

None of the respondent groups saw the flexibility of the current apprenticeship system as a significant negative issue for the apprenticeship system. When asked to respond to the statement that the new flexible arrangements make it easier to put on an apprentice, respondents voiced little disagreement. Only 16% of traditional trainers, 10% of recent trainers and 10% of non-trainers expressed disagreement with this view (Fig. 7). A small majority of traditional trainers also believed that the flexibility of the apprenticeship system had improved over the past years. When presented with the statement that the apprenticeship system is now

more flexible than 5 years ago, 54 % of traditional trainers showed support for this statement. Recent trainers and non-trainers were more divided on this issue with approximately equal fractions of these groups being either supportive or neutral. The latter finding is most likely the consequence of both groups having little experience over an extended period on apprenticeship issues.

Figure 7: Employers do not consider the flexibility of the current apprenticeship system to be a problem



Employment of apprentices through group training companies (GTC) is a viable alternative for business that may not be able or do not want to directly employ an apprentice. Traditional and recent trainers were more supportive of direct employment of apprentices while non-trainers showed no clear preference on this issue (Fig. 8).

There was, however, a marked difference depending upon whether or not the business had ever been a host to apprentices from a GTC. While about 50% of those who had never hosted GTC apprentices believed it was better to employ apprentices directly only about 23% of those who acted as GTC hosts believed direct employment to be preferable. It seems that for most employers the experience of using a GTC is positive. Policy makers may wish to consider ways in which this could be communicated to both non-trainers and employers of apprentices not using a GTC.

Among non-trainers, group training companies appear to be particularly unattractive to medium-sized businesses with 6-19 employees (Fig. 9). Fifty per cent of these firms indicated in the survey agreement with the view that directly employing apprentices is better than getting an apprentice through a GTC. Medium-sized firms therefore may be a good target for policy measures to increase the utilisation of GTCs.

Figure 8: A majority of trainers prefers direct employment of apprentices

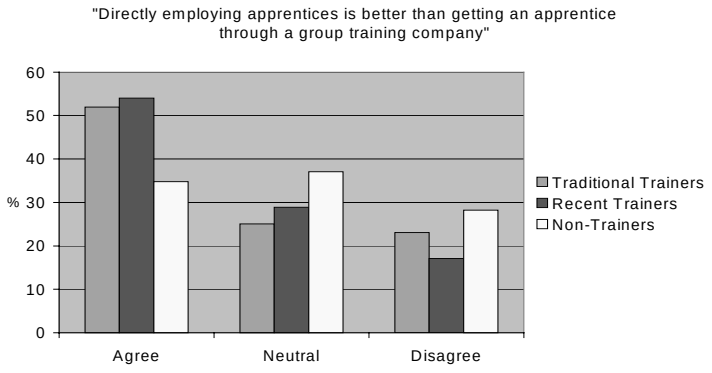
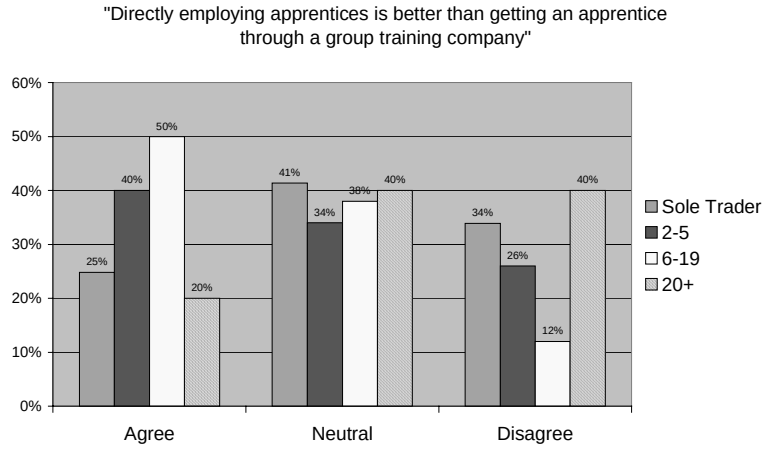


Figure 9: Among non-trainers, group training companies are unattractive to medium-sized businesses



Traditional and recent trainers consider the quality of off-the-job training of apprentices as good with 55% of respondents from each group voicing agreement with the view that the quality of off-the-job training to apprentices is of a high standard. Support for this view is less pronounced among the non-trainers although only 15% of this group disagreed. A training issue where respondents where highly polarised was whether apprentices should attend TAFE/TECH in their own time instead of work time. Only a small fraction of respondents, 15 % and less in each group, was neutral on this issue while the support and disagreement camps were of approximately equal size.

Trainers seem to prefer more mature candidates for apprenticeships while non-trainers seem to have a slight preference for younger apprentices (Fig. 10). When presented with the statement whether they would prefer an apprentice to start at 16 years of age 50% of traditional trainers and 53% of recent trainers disagreed with this view while 44% of non-trainers voiced support.

Surprisingly, in the group of non-trainers it is predominantly the larger firms that would prefer more mature apprentices (Fig. 11). Fifty-seven per cent of respondents from businesses with 20 or more employees showed a preference for apprentices to start at an older age rather than at 16 years. Policy makers may be able to use this leverage and to increase apprentice numbers by marketing older or mature age apprentices to this group of businesses.

Figure 10: Trainers prefer more mature apprentices

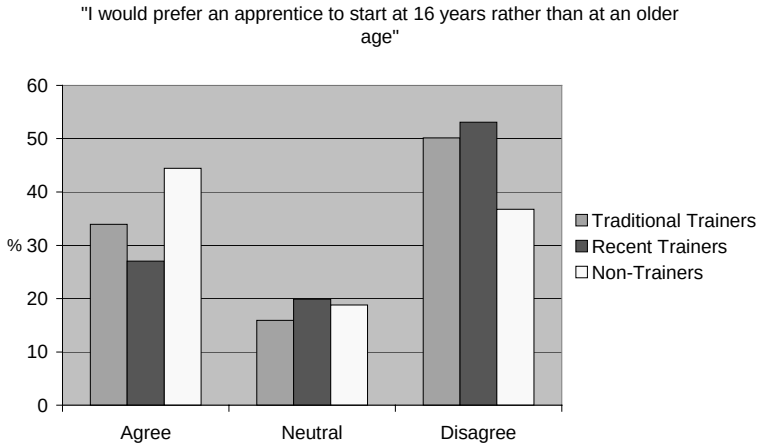
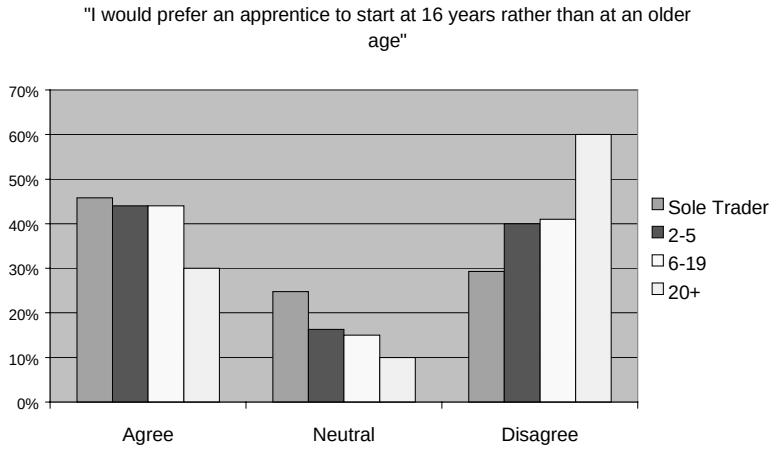


Figure 11: Among non trainers it is mainly the larger firms that tend to prefer more mature apprentices



The attitudes of employers in the electrotechnology sector indicate that the main reason for not employing an apprentice or increasing the existing number was not related to dissatisfaction with the system or a general dissatisfaction with apprentices. Rather they were constrained in recruiting apprentices by either lack of work or the nature of their work. Not surprisingly, employers think primarily about economic parameters when considering putting on apprentices or increasing their numbers. Non-trainers of apprentices identified an expansion in their work as clearly the major factor that would influence them to take on apprentices.

4. Skill issues and apprentice trends in the electrotechnology industry

The purpose of this report is to provide updated information on trends over the years 1995 to 2000 for contracts of training in the electrical and electronics trade occupations in Australia. The information is essentially an update of information provided in *Australian apprentice and trainee statistics: Electrical and electronic trades 1995 to 1999*, NCVER 2000, along with recent employment figures and more detailed information for sub-categories for 2000.

The main electrical and electronics trade occupations for which apprentice and trainee data are considered in this report are:

- Electrical engineering associate professionals (ASCO code 3123)
- Electronics engineering technicians (3124-13)
- Electrical and electronics tradespersons (43)
- Electrical and telecommunications trades assistants (9918).

Comparisons of apprentice and trainee numbers are also made with employment growth in the electrical and electronics trade occupations.

Factors including widespread technological changes, the requirement of trade industries for more highly skilled and productive apprentices, increased competition in world trade and the need to improve the transition from school to work have had a major impact on the employment-based training system in Australia.

The government has reformed the apprenticeship and trainee system by making it more flexible and responsive to employer needs and ensuring that quality training is provided. The new training arrangements covering apprenticeships and traineeships are collectively known as New Apprenticeships which the government began introducing from 1 January 1998.

This report focuses on providing more detailed information on such factors as trends in numbers in training, commencements and completions, in relation specifically to electrical and electronics trade occupation contracts of training (that is, predominantly apprenticeships) by each of the electrical and electronics trade occupation areas. This information is provided in the context of relevant economic and labour market information.

4.1 Overview

Employment

Total employment in the electrotechnology trades workforce was over 193,000 in November 2000 representing about 2.1% of all employment in Australia. Electrotechnology trades are the third largest employer in Australia's trade workforce accounting for around 16% of total trades employment.

For the electrical and electronics trade occupation categories (sub-major ASCO group 43), the total number in employment experienced an annual rate of decline of –1.7% between November 1998 and November 2000 reaching around 173,000. This decline is the most significant downturn in employment levels in the electrotechnology trades workforce over the past five years (figure 1). The electrical and electronics trade sub-category accounts for about 90% of the total electrotechnology trades workforce in 2000. Given a similar decline of 2.7% in the number of apprentices and trainees in these occupation categories from the end of 1999 to the end of 2000, indications are that the number of apprentices and trainees in training as a proportion of the number employed in these occupation categories will essentially remain at its current level of around 9%.

Over the past 5 years, growth in the number of apprentices and trainees in the electrical and electronics trade occupations has been marginally lower than for total employment and considerably lower than for apprentices in all trades. Furthermore, employment in electrical and

electronics trades decreased during 2000, with the number of apprentices and trainees in the electrical and electronics trades also declining but to a lesser extent.

Recent analysis has highlighted some skill shortages exist in Australia's electrical and electronics trades. In recent times, there has been substantial growth in the number of skilled vacancies in the electrical and electronics trades and apprentice and trainee completions are currently not sufficient to supply all the projected employment growth in this industry. As a result, increasing retention of apprentices and trainees in the industry has become a critical issue. In addition, greater priority needs to be placed on training pathways outside the new apprenticeship system.

Apprentices and trainees

The electrotechnology trades workforce is highly skilled with seven in ten (70.0%) having post school qualifications, compared with around 42% for the Australian workforce as a whole. Most of these (56%) have a skilled vocational qualification, which compares very favourably with only 14% of the total workforce having a skilled vocational qualification.

The highly skilled electrotechnology trades workforce is predominantly coming from apprentices and trainees. Almost two thirds 63.5% of apprentices and trainees in training have year 12 or higher qualifications. An additional 33.8% of apprentices and trainees in training also have year 10 or 11 as their highest education level, which broadly equates to a skilled vocational qualification. Apprentices and trainees clearly make up an important part of the skill supply to the electrotechnology trades.

Apprenticeships and traineeships in the electrical and electronics trades remain strongly based in a traditional model with the vast majority being longer than 2 years duration (95.8% in 2000) and at AQF Certificate level III or higher (98.0% in 2000).

Time series (1995 to 2000) for apprentices and trainees

Over the period 1995 to 2000, commencements and the numbers in training in the electrical and electronics trade occupations, excluding electrical and telecommunications trades assistants have remained relatively flat, with commencements declining slightly (-3.6%) and in training increasing by 5.3%.

Over the period 1995 to 2000:

- The number in training in the electrical and electronics trade occupations grew at an annual rate of 1.0%. This compares with an annual growth rate for all trades of 3.6%.
- The number in training grew for the 25 years or higher age cohort (up 30.1%), however this was from a relatively low base of less than 1900 in training. The 20 to 24 year old age cohort also grew over the period (up 3.8%), which equates to an annual growth rate of less than 1%, while the number in training aged 15 to 19 years showed a slight decline (down 1.6%). The industry continues to be dominated by young persons aged 15 to 24 years of age (85.3% in 2000).
- The number of commencements in the electrical and electronics trade occupations declined at an annual rate of –0.8%, with a sharp fall of –20.8% from 1999 to 2000. The level of commencements are now at 1997 levels. About two thirds (63.7%) of commencements in the electrical and electronics trade occupations are electricians, which declined at an annual rate of –1.9%. This compares with an annual growth rate in commencements for all trades of 2.7%.
- The number of completions in the electrical and electronics trade occupations decreased slightly at an annual rate of -0.4%.

For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, AQF Certificate III and higher level numbers in training rose from 13,980 in 1995 to 15,880 in 2000 with an annual growth rate of 2.6%.

The number of apprentices and trainees in full time contracts rose from 14,190 in 1995 to 15,850 in 2000, with an annual growth rate of 2.2%.

Indications are that around 36,000 students[1] (excluding electrical and telecommunications trades assistants) were enrolled in a VET course in 1999 relating to electrical and electronics trade occupations. Noting that there were just over 16,500 apprentices and trainees at the end of 1999, this suggests that around 19,500 students were enrolled in a non-apprentice or non-trainee VET course in 1999 relating to the industry.

Another issue facing employers is the expected stagnation of the teenager population and suggests they will need to consider looking further than teenagers for new entrants. The relevance and quality of training for existing workers is also critical for the industry to keep apace of the rapid technological changes occurring in the industry.

Contract of training data considerations

The contract of training figures for 1995 through 2000 in this report have been derived from apprentice and trainee information available in the NCVER's March 2001 Contracts of Training collection. It should be noted that the 2000 figures may change slightly in subsequent collections owing to the processing of late returns. It also follows that any growth rates presented may also change in the future.

Due to revised occupational data the numbers for in training at the broad occupational level in this report are different to those published in the December quarter NCVER apprentice and trainee release and represent the most up to date information available.

Figures in this report have been rounded to the nearest 100, whereas growth rates have been based on unrounded figures.

Owing to missing historic information for one jurisdiction, 1995 and 1996 completions data has been derived from the December 1998 Contracts of Training data.

4.2 Demand for skills in the electrotechnology trades

Employment levels

Total employment in the electrotechnology trades workforce was over 193,300 in November 2000 (table 1). This represents 2.1% of all employment in Australia. Electrotechnology trades are the third largest area of employment in Australia's trade workforce accounting for over 16% of total trades employment in Australia.

The single largest electrotechnology trades occupation is electricians, accounting for just under half (44.5%) of the total electrotechnology trades workforce. The other significant electrotechnology trades occupations are electronic communications tradespersons and electronics and office equipment tradespersons, accounting for 12.2% and 18.2% of skilled electronics trades employment respectively.

There are an additional 4400 electrical and telecommunications trades assistants.

Electrotechnology trades account for over 6200 employers, with the majority (4521 or 71.4%) as electricians. Notably electronics instrument tradespersons have a high number of employers (130 or 2.1%) in comparison with their share, suggesting that there are a significant number of sole traders within this component of the electrotechnology trades workforce.

[1] This number is based on the assumption that the majority of students enrol in a single course

Table 1: Employment in electrotechnology trades occupations

Trades occupation		Employment at November 2000		Number of Employers[1]
		Number ('000)	Share (per cent)	(at 31 December 2000)
3123	Electrical engineering associate professionals	6.9	3.6	15
3124	Electronic engineering technicians	13.2	6.8	na
4311	Electricians	86.1	44.5	4521
4312	Refrigeration & air conditioning mechanics	19.4	10.0	1094
4313	Electrical distribution tradespersons	7.5	3.9	91
4314	Electronics instrument tradespersons	1.5	0.8	130
4315	Electronics & office equipment tradesperson	35.1	18.2	194
4316	Communications tradespersons	23.6	12.2	193
Sub total		**193.3**	**100.0**	**6238**
9918	Electrical & telecommunications trades assistants	4.4	100.0	156

Source: NCVER, March 2001 and ABS Labour Force Survey

1 Does not include 776 employers at ASCO 43 not further defined. Some employers have apprentices and trainees in different occupations, as a result the sub-total shows the distinct number of employers (ie removes replicated employers).

The size of employer organisations in the electrical and electronics trades varies quite significantly. Of all apprentices and trainees who were in training during 2000 just over half were employed in firms that had 20 or more employees. The medium sized firms (employing between 5 to 19 employees) and the smaller firms (employing between 1 to 4 employees) accounted for about a quarter each of the number of apprentices in training.

Employment trends

For the electrical and electronics trade occupation categories (sub-major ASCO group 43), the total number in employment decreased from 179,100 in November 1998 to 173,100 in November 2000. This represents a decline of 1.7% (table 2). Given the growth in the number of apprentices and trainees in these occupation categories of around 1% between 1998 and 2000, indications are that the number of apprentices and trainees in training as a proportion of the number employed in these occupation categories will decline from its current level of around 9%.

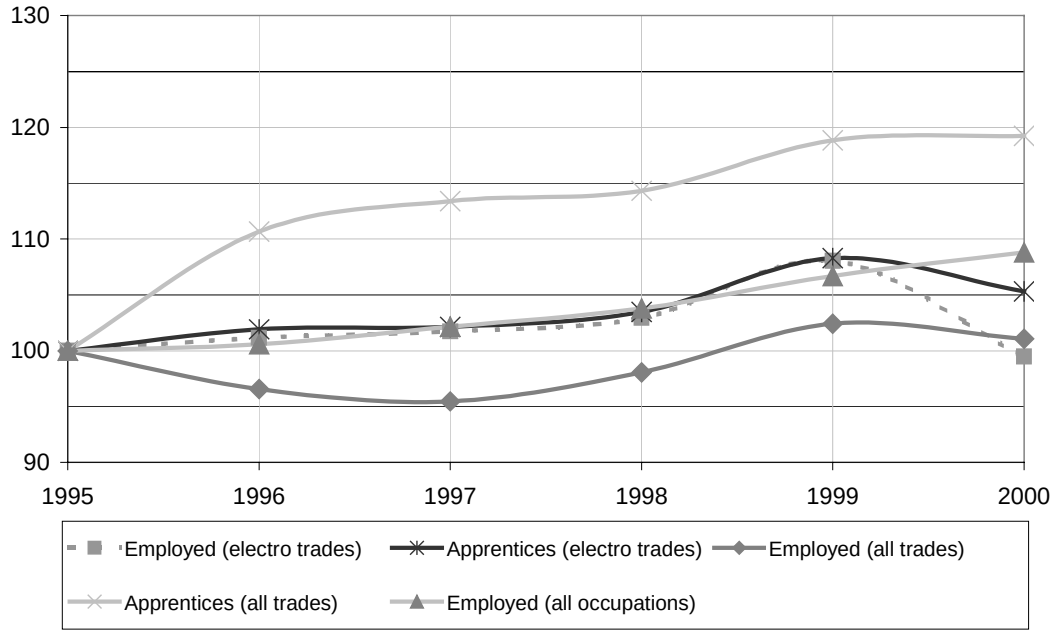
In relation to the electricians occupation category specifically, the total number in employment declined at an annual rate of 3.2% over the 2 years to November 2000. Given the annual growth rate for the number of apprentices and trainees in training in this occupation category of 0.5% between 1998 and 2000, indications are that the number of apprentices and trainees in training as a proportion of the number employed in this occupation category may increase from its level of around 13%.

Several occupational categories declined in total employment over the 2 years to November 2000. Of these, electrical distribution tradespersons experienced declines in apprentices and trainees.

In relation to the electrical and telecommunications trades assistants occupation category specifically, the total number in employment rose at an annual rate of 35.4% between November 1998 and November 2000. Given the growth in the number of apprentices and trainees in training in this occupation category of around 1% between 1998 and 2000, indications are that the number of apprentices and trainees in training as a proportion of the number employed in this occupation category is likely to decrease from its current level of around 14%.

It is also of interest to compare trends in employment and numbers of apprentices and trainees in the electrical and electronics trades over the past 5 years. As shown in figure 1, the growth in the number of apprentices and trainees has been consistently higher than for total employment in all trades over the period 1995 to 2000. Furthermore, both employment in electrical and electronics trades and the number of apprentices and trainees in the electrical and electronics trades have dropped during 2000, with the drop in the number of apprentices and trainees in the electrical and electronics trades not as great.

Figure 1: Electrical and electronics trades, all trades, all occupations and apprentices and trainees in training, 1995 to 2000 (indexed)



Source: DEWRSB trending of ABS Labour Force Survey data and NCVER, March 2001.

The electrotechnology trades have experienced a slight decline in total employment over the two years to November 2000 (table 2). Electrotechnology trades employment declined by 5,000 or 3.4% over this period, which was significantly weaker than for overall trades employment which increased by 35,200 or 3.0%.

Over the period December 1998 to December 2000 the number of apprentices and trainees in training increased by only around 300 or 1.9%. However all occupations increased at a greater rate (35.9%) over this time period and therefore the share of electrotechnology apprentices fell from 7.3% in 1998 to 5.5% in 2000.

Table 2: Employment in the electrical and electronics trade occupations and apprentices and trainees in training, 1998 to 2000

	Total employment		Share of total employment		Employment annual growth*	Number of apprentices and trainees in training		Share of total number in training		In training annual growth*
	Nov '98 ('000)	Nov '00 ('000)	Nov '98 (%)	Nov '00 (%)	1998 to 2000 (%)	Dec '98 ('000)	Dec '00 ('000)	Dec '98 (%)	Dec '00 (%)	1998 to 2000 (%)
3123 Electrical engineering associate professionals	7.5	6.9	0.1	0.1	-4.1	0.1	0.2	0.0	0.1	70.2
3124 Electronic engineering technician	11.7	13.2	0.1	0.1	6.2	(a)	0.0	0.0	0.0	-100.0
4311 Electricians	91.8	86.1	1.1	0.9	-3.2	11.0	11.1	5.1	3.8	0.5
4312 Refrigeration & airconditioning mechanics	17.9	19.4	0.2	0.2	4.1	1.7	1.9	0.8	0.6	4.8
4313 Electrical distribution tradespersons	7.8	7.5	0.1	0.1	-1.9	0.4	0.3	0.2	0.1	-10.9
4314 Electronic instrument tradespersons	1.1	1.5	0.0	0.0	16.8	0.3	0.3	0.2	0.1	-7.3
4315 Electronic & office equipment tradesperson	31.8	35.1	0.4	0.4	5.1	0.4	0.3	0.2	0.1	-18.9
4316 Communications tradespersons	28.7	23.6	0.3	0.3	-9.3	0.3	0.4	0.1	0.1	5.9
Other 43 Electrical and electronics tradespersons	na	na	-	-	-	1.6	1.8	0.8	0.6	4.3
Sub total (ASCO 43 Electrical and electronics tradespersons)	*179.1*	*173.1*	*2.1*	*1.9*	*-1.7*	*15.9*	*16.0*	*7.3*	*5.4*	*0.5*
Total electrotechnology	*198.3*	*193.3*	*2.3*	*2.1*	*-1.3*	*15.9*	*16.2*	*7.3*	*5.5*	*0.9*
9918 Electrical & telecommunications trades assistants	2.4	4.4	0.0	0.0	35.4	0.5	0.6	0.3	0.2	2.8
All trades	*1,155.8*	*1,191.0*	*13.4*	*13.1*	*1.5*	*124.8*	*130.1*	*57.4*	*44.0*	*2.1*
All occupations	*8,651.0*	*9,067.5*	*100.0*	*100.0*	*2.4*	*217.5*	*295.6*	*100.0*	*100.0*	*16.6*

Source: NCVER, March 2001 and ABS Labour Force Survey.
* Annual rates of growth are compound growth rates.
(a) Represents figures between 1 and 9 inclusive

4.3 Skills of the existing electrotechnology trades workforce

Skills of the existing electrotechnology trades workforce

Seven in ten (70.0%) of the skilled trades workforce in the electrotechnology trades have post school qualifications (table 3), significantly higher than for the whole Australian workforce in which around 42% have a post school qualification.

The information shown in table 3 details the highest qualification attained. Some of those with degrees, diplomas and associate diplomas may also have vocational qualifications.

For the electrotechnology trades as a whole:

- About 9% of employed persons have a diploma or associate diploma (or equivalent) as their highest qualification, about the same rate as for the total workforce (around 8%).
- Around 56% have a skilled vocational qualification, significantly higher than for the total workforce (around 14%).
- About 3% of those in the electrotechnology trades workforce hold a degree level or higher qualification compared to over 15% having such qualifications in the total workforce.
- About one in four (24.7%) of those in the electrotechnology trades workforce do not have any qualifications, significantly fewer than for the total workforce (51.3%).

In relative terms, this means that the proportion of the workforce in the electrotechnology trades who possess relevant qualifications (ie diploma and other vocational qualifications) is high compared to the levels of qualifications attained in the workforce as a whole.

The following two tables (tables 4 and 5) detail the highest education level of apprentices and trainees from 1995 to 2000. These two tables show that the skill formation of the electrotechnology trades is coming from apprentices and trainees more than anywhere else. Almost two thirds (63.4%) of apprentices and trainees in training have year 12 or higher qualifications. An additional 33.8% of apprentices and trainees in training also have year 10 or 11 as their highest education level, which broadly equates to a skilled vocational qualification.

Table 3: The education attainment of persons employed in the electrotechnology trades, and the total workforce, 1996

Occupational categories	**Proportion of workforce with (%)**								
	Degree or higher	Diploma	Associate Diploma	Skilled vocational qualification	Basic vocational qualification	Sub Total with qualification	No qualification	Not stated/ unknown	Total
3123 Electrical engineering associate professionals	3.1	2.4	22.5	52.0	4.0	84.0	12.3	3.7	100.0
3124 Electronic engineering technicians	4.8	3.2	20.6	41.8	6.7	77.1	17.3	5.6	100.0
4311 Electricians	0.8	0.6	3.2	74.1	1.0	79.7	16.4	3.9	100.0
4312 Refrigeration & airconditioning mechanics	1.0	0.8	1.7	67.3	1.0	71.8	23.8	4.4	100.0
4313 Electrical distribution tradespersons	0.3	0.2	0.9	58.2	4.7	64.3	25.7	10.0	100.0
4314 Electronic instrument tradespersons	2.9	2.2	11.9	66.4	3.2	86.6	11.9	1.5	100.0
4315 Electrical & office equipment tradespersons	9.0	3.2	9.4	30.5	4.7	56.8	35.5	7.7	100.0
4316 Communications tradespersons	1.9	1.2	4.6	34.5	3.1	45.3	47.5	7.2	100.0
4310 Other electrotechnology trades	0.3	1.0	2.1	43.0	1.8	48.2	45.1	6.7	100.0
Sub total skilled electrotechnology trades	2.6	1.5	7.3	56.4	2.8	70.6	24.1	5.3	100.0
9918 Electrical & telecommunication trades assistants	1.1	0.7	0.9	18.3	2.4	23.4	70.4	6.2	100.0
Total electrotechnology	**2.6**	**1.4**	**7.2**	**55.9**	**2.9**	**70.0**	**24.7**	**5.3**	**100.0**
Total Australian workforce	15.5	4.5	3.5	14.2	3.8	41.5	51.3	7.2	100.0

Sources: NCVER (1998) The Outlook for Training in Australia's Industries, Table A2 and ABS 1996 Census of Population and Housing.

Table 4: Electrical and electronics trade commencements by highest education level, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
Degree or postgraduate diploma	0	0	0	0	0	(a)	-	-
Associate or undergraduate diploma	(a)	(a)	0	0	0	20	72.4	-
Trade/Technician certificate	(a)	0	(a)	(a)	(a)	(a)	0.3	-66.1
Other certificate	0	0	(a)	0	(a)	10	-	204.5
Unspecified post-secondary education	0	0	0	0	0	0	-	-
Year 12	10	(a)	20	20	30	50	37.7	54.7
Year 10 or 11	0	0	(a)	(a)	(a)	(a)	-	405.2
Year 9 or lower	0	0	0	0	0	(a)	-	-
Unknown	0	0	0	0	0	(a)	-	-
Sub total	**10**	**(a)**	**30**	**20**	**40**	**90**	**49.7**	**125.2**
3124-13 Electronics engineering technician								
Degree or postgraduate diploma	0	0	0	0	0	0	-	-
Associate or undergraduate diploma	0	(a)	0	0	0	0	-	-
Trade/Technician certificate	0	0	0	0	0	0	-	-
Other certificate	0	0	0	0	0	0	-	-
Unspecified post-secondary education	0	0	0	0	0	0	-	-
Year 12	(a)	0	0	0	0	0	-100.0	-
Year 10 or 11	0	0	0	0	0	0	-	-
Year 9 or lower	0	0	0	0	0	0	-	-
Unknown	0	0	0	0	0	0	-	-
Sub total	**(a)**	**(a)**	**0**	**0**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
Degree or postgraduate diploma	(a)	(a)	(a)	(a)	10	20	42.7	136.6
Associate or undergraduate diploma	(a)	(a)	(a)	10	20	10	23.3	-40.7
Trade/Technician certificate	50	40	30	80	110	60	5.8	-44.3
Other certificate	50	80	110	180	190	190	31.0	1.2
Unspecified post-secondary education	20	(a)	(a)	70	50	30	14.1	-36.7
Year 12	1800	1710	1840	1920	2180	1570	-2.6	-27.9
Year 10 or 11	1330	1220	1260	1330	1470	1120	-3.4	-24.0
Year 9 or lower	40	50	60	50	80	70	14.0	-13.0
Unknown	130	50	40	30	30	20	-31.0	-38.0
Sub total	**3410**	**3160**	**3360**	**3670**	**4140**	**3100**	**-1.9**	**-25.2**
4312 Refrigeration and airconditioning mechanics								
Degree or postgraduate diploma	0	0	0	(a)	(a)	(a)	-	0.4
Associate or undergraduate diploma	(a)	(a)	(a)	(a)	(a)	(a)	0.0	-74.9
Trade/Technician certificate	10	(a)	(a)	20	30	10	-1.1	-49.1
Other certificate	10	10	(a)	20	20	10	7.3	-32.2
Unspecified post-secondary education	(a)	(a)	(a)	10	40	20	32.8	-55.4
Year 12	250	230	250	290	290	240	-0.3	-16.4
Year 10 or 11	200	190	270	240	300	270	5.8	-12.3
Year 9 or lower	(a)	(a)	10	20	10	10	12.6	11.2
Unknown	20	(a)	10	(a)	(a)	(a)	-20.7	4.7
Sub total	**500**	**450**	**570**	**600**	**700**	**580**	**2.7**	**-18.0**

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 4 continued: Electrical and electronics trade commencements by highest education level, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
4313 Electrical distribution tradespersons								
Degree or postgraduate diploma	0	0	0	(a)	0	0	-	-
Associate or undergraduate diploma	0	(a)	(a)	(a)	(a)	(a)	-	-48.6
Trade/Technician certificate	(a)	(a)	(a)	(a)	(a)	(a)	-16.7	-59.8
Other certificate	(a)	(a)	(a)	10	10	(a)	-24.2	-91.6
Unspecified post-secondary education	(a)	(a)	(a)	30	50	(a)	15.1	-95.7
Year 12	100	70	70	50	50	60	-10.3	6.4
Year 10 or 11	20	20	30	20	10	20	-6.6	55.5
Year 9 or lower	(a)	(a)	(a)	(a)	(a)	(a)	-19.6	-49.7
Unknown	(a)	0	(a)	0	0	0	-100.0	-
Sub total	**140**	**110**	**120**	**120**	**130**	**80**	**-10.5**	**-38.6**
4314 Electronics instrument tradespersons								
Degree or postgraduate diploma	0	0	0	0	0	(a)	-	-
Associate or undergraduate diploma	0	0	0	0	0	(a)	-	-
Trade/Technician certificate	0	(a)	(a)	(a)	20	(a)	-	-85.6
Other certificate	0	(a)	(a)	(a)	(a)	(a)	-	45.7
Unspecified post-secondary education	0	(a)	0	(a)	(a)	(a)	-	-49.5
Year 12	40	50	60	60	60	60	5.3	-9.5
Year 10 or 11	50	20	10	20	30	20	-13.7	-36.8
Year 9 or lower	0	0	0	0	0	(a)	-	-
Unknown	0	0	(a)	(a)	0	0	-	-
Sub total	**90**	**70**	**90**	**100**	**120**	**90**	**0.7**	**-22.6**
4315 Electronics and office equipment tradesperson								
Degree or postgraduate diploma	0	0	0	0	(a)	(a)	-	1.5
Associate or undergraduate diploma	(a)	0	0	(a)	(a)	(a)	25.9	216.9
Trade/Technician certificate	(a)	(a)	0	(a)	(a)	(a)	-4.6	216.7
Other certificate	(a)	(a)	(a)	(a)	(a)	(a)	-12.2	4.1
Unspecified post-secondary education	(a)	0	0	0	(a)	10	21.0	159.8
Year 12	140	140	80	80	110	80	-10.7	-25.4
Year 10 or 11	110	80	60	50	50	50	-16.0	-3.7
Year 9 or lower	(a)	(a)	(a)	(a)	(a)	(a)	1.0	5.1
Unknown	20	(a)	(a)	(a)	(a)	(a)	-24.2	400.4
Sub total	**290**	**240**	**150**	**150**	**170**	**150**	**-11.6**	**-8.0**
4316 Communications tradespersons								
Degree or postgraduate diploma	(a)	0	0	(a)	0	0	-100.0	-
Associate or undergraduate diploma	(a)	(a)	0	(a)	(a)	(a)	-12.9	-49.9
Trade/Technician certificate	(a)	(a)	0	(a)	(a)	(a)	-10.1	-70.7
Other certificate	0	(a)	(a)	(a)	(a)	(a)	-	56.7
Unspecified post-secondary education	0	0	0	(a)	(a)	(a)	-	1.4
Year 12	30	60	80	60	120	90	21.2	-24.0
Year 10 or 11	20	20	40	40	90	40	17.8	-55.6
Year 9 or lower	0	0	(a)	(a)	(a)	(a)	-	-53.4
Unknown	(a)	(a)	0	(a)	(a)	(a)	0.1	0.6
Sub total	**60**	**90**	**120**	**120**	**230**	**150**	**20.7**	**-36.2**

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 4 continued: Electrical and electronics trade commencements by highest education level, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
Degree or postgraduate diploma	(a)	(a)	(a)	0	(a)	(a)	-12.3	3.9
Associate or undergraduate diploma	(a)	(a)	(a)	(a)	(a)	(a)	-12.8	101.7
Trade/Technician certificate	20	10	10	20	30	20	-2.5	-26.0
Other certificate	(a)	20	20	40	50	40	37.8	-15.8
Unspecified post-secondary education	(a)	(a)	(a)	40	40	70	70.1	69.7
Year 12	270	280	210	230	310	310	2.7	-0.9
Year 10 or 11	190	200	150	170	170	180	-1.4	6.7
Year 9 or lower	(a)	(a)	(a)	(a)	(a)	(a)	-14.5	-41.1
Unknown	60	60	30	20	10	(a)	-38.4	-57.1
Sub total	**560**	**590**	**440**	**520**	**610**	**630**	**2.2**	**2.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
Degree or postgraduate diploma	(a)	(a)	(a)	(a)	20	30	36.2	118.6
Associate or undergraduate diploma	10	20	(a)	20	30	40	22.6	13.9
Trade/Technician certificate	90	70	60	130	190	100	1.8	-45.8
Other certificate	80	120	160	260	290	280	28.7	-3.4
Unspecified post-secondary education	30	20	20	150	190	140	34.4	-26.8
Year 12	2640	2560	2620	2710	3150	2450	-1.4	-22.1
Year 10 or 11	1910	1740	1820	1870	2120	1690	-2.5	-20.4
Year 9 or lower	60	70	80	80	120	100	10.8	-13.4
Unknown	240	120	90	70	50	40	-29.6	-22.8
TOTAL	**5070**	**4710**	**4870**	**5300**	**6150**	**4870**	**-0.8**	**-20.8**
9918 Electrical and telecommunications trades assistants								
Degree or postgraduate diploma	(a)	0	(a)	0	(a)	(a)	0.2	-59.6
Associate or undergraduate diploma	0	(a)	(a)	(a)	10	(a)	-	-76.7
Trade/Technician certificate	(a)	(a)	(a)	20	40	30	97.1	-25.6
Other certificate	(a)	(a)	10	20	60	30	49.2	-48.1
Unspecified post-secondary education	0	(a)	(a)	20	30	(a)	-	-79.1
Year 12	20	160	220	270	330	250	71.2	-24.2
Year 10 or 11	20	120	150	230	310	220	61.4	-28.7
Year 9 or lower	(a)	10	10	20	30	20	36.3	-26.4
Unknown	30	30	(a)	30	(a)	(a)	-24.5	102.5
Sub total	**80**	**330**	**410**	**610**	**820**	**570**	**47.4**	**-30.2**

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 5: Electrical and electronics trade number in training by highest education level, 31 December 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
Degree or postgraduate diploma	0	0	0	0	0	(a)	-	-
Associate or undergraduate diploma	(a)	(a)	(a)	(a)	0	20	71.9	-
Trade/Technician certificate	(a)	(a)	(a)	(a)	(a)	(a)	47.6	16.7
Other certificate	0	0	(a)	(a)	(a)	20	-	240.0
Unspecified post-secondary education	0	0	0	0	0	0	-	-
Year 12	20	10	30	50	70	120	43.3	64.3
Year 10 or 11	(a)	0	(a)	(a)	(a)	10	38.0	100.0
Year 9 or lower	0	0	0	0	0	(a)	-	-
Unknown	0	0	0	0	0	(a)	-	-
Sub total	**20**	**20**	**40**	**60**	**90**	**170**	**49.4**	**98.8**
3124-13 Electronics engineering technician								
Degree or postgraduate diploma	0	0	0	0	0	0	-	-
Associate or undergraduate diploma	0	(a)	0	0	0	0	-	-
Trade/Technician certificate	0	0	0	0	0	0	-	-
Other certificate	0	0	0	0	0	0	-	-
Unspecified post-secondary education	0	0	0	0	0	0	-	-
Year 12	(a)	(a)	(a)	(a)	0	0	-100.0	-
Year 10 or 11	0	0	0	0	0	0	-	-
Year 9 or lower	0	0	0	0	0	0	-	-
Unknown	0	0	0	0	0	0	-	-
Sub total	**(a)**	**(a)**	**(a)**	**(a)**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
Degree or postgraduate diploma	(a)	(a)	(a)	(a)	10	30	43.1	150.0
Associate or undergraduate diploma	10	10	20	20	40	50	33.7	23.7
Trade/Technician certificate	100	110	110	150	210	200	14.3	-2.9
Other certificate	80	140	230	360	460	530	47.6	13.6
Unspecified post-secondary education	30	30	30	140	150	150	41.2	-2.7
Year 12	6040	6130	6070	5970	6280	5970	-0.2	-4.9
Year 10 or 11	4160	4140	4130	4030	4150	3900	-1.3	-6.0
Year 9 or lower	100	100	110	130	180	180	12.1	1.7
Unknown	300	280	240	200	140	100	-19.0	-24.8
Sub total	**10820**	**10950**	**10950**	**11000**	**11610**	**11110**	**0.5**	**-4.3**
4312 Refrigeration and airconditioning mechanics								
Degree or postgraduate diploma	0	0	0	(a)	(a)	(a)	-	66.7
Associate or undergraduate diploma	(a)	(a)	(a)	(a)	(a)	(a)	20.1	0.0
Trade/Technician certificate	20	20	30	40	50	40	12.3	-10.9
Other certificate	10	20	20	30	40	50	35.1	4.7
Unspecified post-secondary education	(a)	10	10	30	60	70	52.5	3.1
Year 12	710	760	800	840	850	840	3.5	-1.6
Year 10 or 11	560	590	650	690	770	810	7.5	4.5
Year 9 or lower	20	20	30	30	40	40	11.3	7.9
Unknown	50	40	40	40	30	30	-12.6	4.0
Sub total	**1390**	**1470**	**1580**	**1710**	**1850**	**1880**	**6.2**	**1.4**

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 5 continued: Electrical and electronics trade number in training by highest education level, 31 December 1995 to 2000

	Number						Annual growth rate*	Growth
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	1999 - 2000 (%)
4313 Electrical distribution tradespersons								
Degree or postgraduate diploma	0	0	0	(a)	(a)	(a)	-	0.0
Associate or undergraduate diploma	0	(a)	(a)	(a)	(a)	(a)	-	-25.0
Trade/Technician certificate	20	10	10	10	10	(a)	-10.9	-30.8
Other certificate	(a)	10	20	30	40	30	26.6	-25.7
Unspecified post-secondary education	(a)	10	20	40	70	50	77.6	-25.4
Year 12	330	320	290	240	200	170	-11.9	-11.7
Year 10 or 11	160	120	80	60	50	50	-21.7	0.0
Year 9 or lower	10	(a)	(a)	(a)	(a)	(a)	-16.1	0.0
Unknown	30	20	10	(a)	(a)	(a)	-47.9	0.0
Sub total	**560**	**510**	**440**	**400**	**380**	**320**	**-10.5**	**-14.7**
4314 Electronics instrument tradespersons								
Degree or postgraduate diploma	0	0	0	0	0	0	-	-
Associate or undergraduate diploma	0	(a)	(a)	(a)	(a)	(a)	-	100.0
Trade/Technician certificate	0	(a)	(a)	(a)	20	20	-	11.1
Other certificate	0	(a)	(a)	10	10	20	-	14.3
Unspecified post-secondary education	(a)	(a)	(a)	(a)	(a)	(a)	14.9	-50.0
Year 12	70	130	180	210	200	200	21.7	-2.5
Year 10 or 11	130	130	110	120	80	60	-13.4	-20.5
Year 9 or lower	(a)	(a)	(a)	0	0	(a)	-24.2	-
Unknown	(a)	(a)	(a)	(a)	(a)	(a)	0.0	-33.3
Sub total	**210**	**280**	**310**	**350**	**320**	**300**	**7.7**	**-5.7**
4315 Electronics and office equipment tradesperson								
Degree or postgraduate diploma	0	0	0	0	(a)	(a)	-	0.0
Associate or undergraduate diploma	(a)	(a)	0	(a)	(a)	(a)	24.6	200.0
Trade/Technician certificate	(a)	(a)	(a)	(a)	(a)	(a)	-15.0	33.3
Other certificate	(a)	10	10	20	20	20	14.9	6.7
Unspecified post-secondary education	(a)	(a)	(a)	(a)	(a)	10	34.1	225.0
Year 12	490	470	370	260	220	180	-18.7	-20.4
Year 10 or 11	390	250	190	140	90	70	-29.8	-21.2
Year 9 or lower	10	10	(a)	(a)	(a)	(a)	-21.4	-50.0
Unknown	30	30	20	10	(a)	(a)	-34.8	33.3
Sub total	**950**	**790**	**610**	**440**	**340**	**290**	**-21.3**	**-15.3**
4316 Communications tradespersons								
Degree or postgraduate diploma	(a)	(a)	(a)	(a)	(a)	(a)	0.0	0.0
Associate or undergraduate diploma	(a)	(a)	(a)	(a)	(a)	(a)	8.4	0.0
Trade/Technician certificate	(a)	(a)	(a)	(a)	(a)	(a)	-12.9	-80.0
Other certificate	0	(a)	(a)	(a)	10	20	-	70.0
Unspecified post-secondary education	0	0	0	10	(a)	(a)	-	0.0
Year 12	80	120	170	180	230	210	22.9	-5.3
Year 10 or 11	40	50	70	100	120	100	19.9	-16.8
Year 9 or lower	0	0	(a)	(a)	10	10	-	0.0
Unknown	(a)	(a)	(a)	(a)	(a)	(a)	14.9	0.0
Sub total	**120**	**180**	**260**	**310**	**380**	**350**	**23.6**	**-7.6**

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 5 continued: Electrical and electronics trade number in training by highest education level, 31 December 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
Degree or postgraduate diploma	(a)	(a)	(a)	(a)	(a)	(a)	-19.7	100.0
Associate or undergraduate diploma	20	20	10	(a)	(a)	(a)	-19.7	0.0
Trade/Technician certificate	70	60	50	50	60	60	-3.2	8.6
Other certificate	20	30	40	70	100	130	53.5	23.1
Unspecified post-secondary education	20	10	10	90	100	160	58.5	55.3
Year 12	650	750	750	760	820	880	6.4	6.9
Year 10 or 11	410	490	500	520	490	480	3.1	-2.8
Year 9 or lower	10	20	10	20	20	20	2.9	-28.6
Unknown	120	120	130	120	90	50	-14.9	-39.3
Sub total	**1320**	**1490**	**1510**	**1640**	**1700**	**1780**	**6.3**	**5.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
Degree or postgraduate diploma	10	10	10	20	20	40	29.7	120.0
Associate or undergraduate diploma	30	40	40	40	60	80	21.0	45.6
Trade/Technician certificate	230	220	220	280	360	350	8.7	-2.8
Other certificate	120	210	330	520	690	790	46.8	14.8
Unspecified post-secondary education	60	70	80	310	400	450	50.8	11.0
Year 12	8380	8700	8660	8500	8870	8570	0.4	-3.4
Year 10 or 11	5860	5770	5740	5660	5750	5470	-1.4	-4.8
Year 9 or lower	160	160	170	200	260	260	9.3	-0.4
Unknown	530	500	460	390	260	200	-18.1	-25.0
TOTAL	**15380**	**15670**	**15710**	**15920**	**16660**	**16200**	**1.0**	**-2.7**
9918 Electrical and telecommunications trades assistants								
Degree or postgraduate diploma	(a)	0	(a)	0	(a)	(a)	14.9	-60.0
Associate or undergraduate diploma	0	(a)	(a)	(a)	(a)	(a)	-	-50.0
Trade/Technician certificate	(a)	(a)	(a)	20	30	30	93.3	8.0
Other certificate	(a)	(a)	10	20	50	30	46.5	-41.3
Unspecified post-secondary education	0	(a)	(a)	20	30	20	-	-37.9
Year 12	20	140	200	240	260	260	72.3	-1.9
Year 10 or 11	20	100	110	200	240	210	68.0	-10.8
Year 9 or lower	(a)	10	(a)	20	20	20	33.2	-8.7
Unknown	30	20	(a)	20	(a)	(a)	-30.6	66.7
Sub total	**80**	**290**	**350**	**550**	**640**	**580**	**50.3**	**-10.3**

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Commencements, number in training and completions, 1995 to 2000

This section focuses on trends in commencements, number in training and completions from 1995 to 2000.

For commencements (table 6):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, commencements grew from 5,070 in 1995 to 6,150 in 1999 and then dropped to 4,870 in 2000.
- The annual growth rate for commencements over the period 1995 to 2000 was –0.8%, with a large drop of –20.8% from 1999 to 2000. This is broadly in line with the trend in commencements in all trades which have grown at an annual growth rate of 2.7% over the period 1995 to 2000 but declined by 11.1% from 1999 to 2000.
- Growth in commencements varied across the selected 4-digit level trades over the period 1995 to 2000. The biggest growth in terms of numbers occurred for communications tradespersons while electricians, electrical distribution tradespersons, and electronics and office equipment tradespersons declined.
- Commencements for electrical and telecommunications trades assistants grew very strongly from 80 in 1995 to 820 in 1999 then declined to 570 in 2000.

For the number in training (table 7):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, the number in training grew from 15,380 in 1995 to 16,200 in 2000.
- The annual growth rate for the number in training over the period 1995 to 2000 was 1.0%, the growth rate for 1999 to 2000 being negative at –2.7%. This is broadly in line with the trend for the number of trade apprentices and trainees in training which increased at an annual growth rate of 3.6% over the period 1995 to 2000 but remained essentially the same since 1999.
- The number in training grew for all selected 4-digit level occupations over the period 1995 to 2000 except electrical distribution tradespersons and electronics and office equipment tradespersons.
- The number in training for electrical and telecommunications trades assistants grew very strongly, from 80 in 1995 to 640 in 1999, followed by a slight decline to 580 in 2000.

For completions[2](table 8):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, completions declined marginally from 3,650 in 1995 to 3,580 in 2000.
- The annual growth rate for completions over the period 1995 to 2000 was –0.4%, the growth rate for 1999 to 2000 is lower at –3.5%. This compares with an annual growth rate in completions for all trades of 3.2% over the period 1995 to 2000.
- Growth for completions varied across the selected 4-digit level occupations over the period 1995 to 2000. The biggest growth occurred for communications tradespersons while several occupations including electricians declined.
- Completions for electrical and telecommunications trades assistants grew strongly, from 10 in 1995 to 320 in 2000.

[2] It should be noted that completions data should be treated with caution due to the possibility of under-reporting.

Table 6: Electrical and electronics trades commencements, 1995 to 2000

		Number						Annual growth rate*	Annual growth rate*	Growth
		1995	1996	1997	1998	1999	2000	1995-2000	1995 – 1999	1999 - 2000 (%)
3123	Electrical engineering associate professionals	10	(a)	30	20	40	90	49.6	35.1	125.0
3124-13	Electronics Engineering Technician	(a)	(a)	0	0	0	0	-100.0	-100.0	-
4311	Electricians	3410	3160	3360	3670	4140	3100	-1.9	5.0	-25.2
4312	Refrigeration & airconditioning mechanics	500	450	570	600	700	580	2.7	8.7	-18.0
4313	Electrical distribution tradespersons	140	110	120	120	130	80	-10.4	-1.6	-38.3
4314	Electronics instrument tradespersons	90	70	90	100	120	90	0.7	7.5	-22.7
4315	Electronics & office equipment tradespersons	290	240	150	150	170	160	-11.5	-12.5	-7.7
4316	Communications tradespersons	60	90	120	120	230	150	20.7	41.6	-36.2
Other 43	Electrical & electronics tradespersons not known at 4-digit level	560	590	440	520	610	630	2.2	2.1	2.3
Sub total		**5070**	**4710**	**4870**	**5300**	**6150**	**4870**	**-0.8**	**5.0**	**-20.8**
9918	Electrical & telecommunications trades assistants	80	330	410	610	820	570	47.4	77.7	-30.2
Total ALL Trades		*41690*	*40890*	*40520*	*48170*	*53710*	*47730*	*2.7*	*6.5*	*-11.1*

Source: NCVER, March 2001

Table 7: Electrical and electronics trades number in training, 31 December 1995 to 2000

		Number						Annual growth rate*	Annual growth rate*	Growth
		1995	1996	1997	1998	1999	2000	1995-2000	1995 – 1999	1999 - 2000 (%)
3123	Electrical engineering associate professionals	20	20	40	60	90	170	49.4	39.1	98.8
3124-13	Electronics Engineering Technician	(a)	(a)	(a)	(a)	0	0	-100.0	-100.0	-
4311	Electricians	10820	10950	10950	11000	11610	11110	0.5	1.8	-4.3
4312	Refrigeration & airconditioning mechanics	1390	1470	1580	1710	1850	1880	6.2	7.5	1.4
4313	Electrical distribution tradespersons	560	510	440	400	380	320	-10.5	-9.4	-14.7
4314	Electronics instrument tradespersons	210	280	310	350	320	300	7.7	11.3	-5.7
4315	Electronics & office equipment tradesperson	950	790	610	440	340	290	-21.3	-22.7	-15.3
4316	Communications tradespersons	120	180	260	310	380	350	23.6	32.9	-7.6
Other 43	Electrical & electronics tradespersons not known at 4-digit level	1320	1490	1510	1640	1700	1780	6.3	6.6	5.3
Sub total		**15380**	**15670**	**15710**	**15920**	**16660**	**16200**	**1.0**	**2.0**	**-2.7**
9918	Electrical & telecommunications trades assistants	80	290	350	550	640	580	50.3	71.0	-10.3
Total ALL Trades		109140	120790	123770	124770	129690	130120	3.6	4.4	0.3

Source: NCVER, March 2001

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Table 8: Electrical and electronics trade completions 1995 to 2000

		Number						Annual growth rate*	Annual growth rate*	Growth 1999 - 2000
		1995	1996	1997	1998	1999	2000	1995-2000	1995 – 1999	(%)
3123	Electrical engineering associate professionals	(a)	(a)	(a)	(a)	10	(a)	-16.7	21.8	-81.8
3124-13	Electronics Engineering Technician	0	0	0	0	0	0	-	-	-
4311	Electricians	2690	2330	2550	2560	2440	2440	-1.9	-2.4	0.0
4312	Refrigeration & airconditioning mechanics	250	260	320	290	360	350	7.0	9.2	-1.4
4313	Electrical distribution tradespersons	170	150	140	120	120	100	-8.8	-8.6	-9.6
4314	Electronics instrument tradespersons	40	30	50	110	120	90	17.2	28.9	-19.8
4315	Electronics & office equipment tradesperson	320	240	210	190	160	120	-18.0	-16.0	-25.5
4316	Communications tradespersons	20	20	20	60	110	70	25.8	48.2	-34.7
Other 43	Electrical & electronics tradespersons not known at 4-digit level	160	230	270	290	410	410	20.6	26.4	-0.2
Sub total		**3650**	**3270**	**3570**	**3610**	**3710**	**3580**	**-0.4**	**0.4**	**-3.5**
9918	Electrical & telecommunications trades assistants	10	50	220	220	340	320	90.3	125.8	-4.1
Total ALL Trades		*22700*	*24050*	*26410*	*27880*	*27100*	*26610*	*3.2*	*4.5*	*-1.8*

Source: NCVER, March 2001

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

4.4 Trends in specific occupations, 1995 to 2000

This sections comments on trends specifically in relation to the 4-digit occupations under review.

The occupations which showed strong growth in terms of numbers in training over the period 1995 to 2000 were:

- Electrical and telecommunications trades assistants (annual growth of 50.3%),
- Electrical engineering associate professionals (49.4%)
- Communications tradespersons (23.6%),
- Electronics instrument tradespersons (7.7%), and
- Refrigeration and airconditioning mechanics (6.2%).

Two occupations showed declines in numbers in training over the period 1995 to 2000:

- Electronics and office equipment tradespersons (-21.3%), and
- Electrical distribution tradespersons (-10.5%).

Age

This section focuses on trends in commencements and numbers in training from 1995 to 2000 by age.

For commencements (table 9):

- In 2000, commencements by 15 to 19 year and 20 to 24 year olds in all the selected electrical and electronics trades (excluding electrical and telecommunications trades assistants) dropped below 1995 levels. Commencements by apprentices and trainees of age 25 and older also dropped but stayed above 1995 levels.
- Annual growth rates were positive for older age cohorts with the 25 or more years age cohorts having a rate of growth of 3.7% over the period 1995 to 2000. The growth rate for 15 to 19 year olds was –1.5% and that for 20 to 24 year olds was –0.7%.
- In terms of rates of growth, several 4-digit occupations experienced their strongest growth (or smallest decline) in the 25 or more year old age group when compared with the other age groups.
- Several 4 digit occupations experienced declines in commencements over the period 1995 to 2000 including electricians primarily as a result of a decline in the number of 15 to 19 year old commencements.

For the number in training (table 10):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, the number in training grew for the older age cohorts (20 to 24 year olds and apprentices and trainees of age 25 and more) over the period 1995 to 2000; while that for 15 to 19 year olds dropped back to 1995 levels.
- The 25 or more years age cohort had the highest annual growth rate over the period 1995 to 2000 (5.4%) while growth rates for the 20 to 24 and 15 to 19 year old cohorts were 0.7% and -0.3% respectively.
- Although the annual growth rate was highest for the 25 years or higher age cohort, the industry continues to be dominated by young persons aged 15 to 24 years of age (85.3% in 2000).
- The electrical distribution and electronics and office equipment tradespersons occupations both experienced a decline in the numbers in training in each age cohort; 15 to 19, 20 to 24, and 25 or more years; over the period 1995 to 2000.

Table 9: Electrical and electronics trade commencements by age, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
15 to 19 years	(a)	(a)	10	10	30	30	43.1	20.0
20 to 24 years	(a)	(a)	10	10	(a)	30	49.6	328.6
25 years and over	(a)	0	(a)	(a)	(a)	40	67.0	387.5
Sub total[1]	**10**	**(a)**	**30**	**20**	**40**	**90**	**49.6**	**125.0**
3124-13 Electronics engineering technician								
15 to 19 years	(a)	0	0	0	0	0	-100.0	-
20 to 24 years	(a)	(a)	0	0	0	0	-100.0	-
25 years and over	0	0	0	0	0	0	-	-
Sub total[1]	**(a)**	**(a)**	**0**	**0**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
15 to 19 years	2340	2210	2240	2480	2820	2100	-2.2	-25.8
20 to 24 years	750	660	760	810	910	660	-2.5	-27.9
25 years and over	320	300	350	380	410	350	1.6	-14.4
Sub total[1]	**3410**	**3160**	**3360**	**3670**	**4140**	**3100**	**-1.9**	**-25.2**
4312 Refrigeration and airconditioning mechanics								
15 to 19 years	360	320	380	400	440	400	2.1	-10.0
20 to 24 years	100	100	110	130	170	100	-0.6	-41.4
25 years and over	40	30	80	60	90	80	12.6	-15.6
Sub total[1]	**500**	**450**	**570**	**600**	**700**	**580**	**2.7**	**-18.0**
4313 Electrical distribution tradespersons								
15 to 19 years	90	70	50	50	70	50	-11.6	-33.8
20 to 24 years	30	30	40	40	40	20	-6.4	-48.6
25 years and over	30	20	20	30	20	10	-11.6	-41.7
Sub total[1]	**140**	**110**	**120**	**120**	**130**	**80**	**-10.4**	**-38.3**
4314 Electronics instrument tradespersons								
15 to 19 years	40	50	60	50	70	60	8.1	-14.5
20 to 24 years	40	20	20	20	20	20	-11.1	-4.8
25 years and over	10	10	(a)	30	30	10	0.0	-55.2
Sub total[1]	**90**	**70**	**90**	**100**	**120**	**90**	**0.7**	**-22.7**
4315 Electronics and office equipment tradesperson								
15 to 19 years	200	130	60	60	90	90	-14.1	3.3
20 to 24 years	70	80	50	70	60	40	-8.1	-22.8
25 years and over	20	30	40	20	20	20	-2.3	-20.0
Sub total[1]	**290**	**240**	**150**	**150**	**170**	**160**	**-11.5**	**-7.7**
4316 Communications tradespersons								
15 to 19 years	30	60	70	70	110	100	24.1	-13.4
20 to 24 years	20	30	40	40	50	50	19.5	-1.5
25 years and over	(a)	(a)	10	10	70	(a)	-2.4	-92.8
Sub total[1]	**60**	**90**	**120**	**120**	**230**	**150**	**20.7**	**-36.2**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
15 to 19 years	390	400	300	340	350	380	-0.4	7.6
20 to 24 years	120	120	80	120	180	160	7.1	-10.0
25 years and over	60	70	50	70	80	90	7.2	6.3
Sub total[1]	**560**	**590**	**440**	**520**	**610**	**630**	**2.2**	**2.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
15 to 19 years	3460	3230	3190	3460	3990	3210	-1.5	-19.7
20 to 24 years	1120	1020	1110	1240	1430	1080	-0.7	-24.6
25 years and over	490	460	570	600	730	590	3.7	-19.6
TOTAL[1]	**5070**	**4710**	**4870**	**5300**	**6150**	**4870**	**-0.8**	**-20.8**
9918 Electrical and telecommunications trades assistants								
15 to 19 years	*40*	*190*	*220*	*240*	*350*	*250*	*44.6*	*-28.8*
20 to 24 years	*30*	*70*	*110*	*160*	*200*	*190*	*46.0*	*-7.7*
25 years and over	*20*	*60*	*80*	*210*	*270*	*140*	*55.7*	*-49.3*
Sub total[1]	*80*	*330*	*410*	*610*	*820*	*570*	*47.4*	*-30.2*

* Annual rates of growth are compound growth rates

[1] Totals may include ages other than those in the range 15 to 64 (a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 10: Electrical and electronics trade number in training by age, 31 December 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
15 to 19 years	(a)	(a)	10	10	30	30	76.2	30.8
20 to 24 years	10	(a)	20	40	40	80	51.6	110.5
25 years and over	10	(a)	(a)	10	20	60	39.0	159.1
Sub total[1]	**20**	**20**	**40**	**60**	**90**	**170**	**49.4**	**98.8**
3124-13 Electronics engineering technician								
15 to 19 years	0	0	0	0	0	0	-	-
20 to 24 years	(a)	(a)	(a)	(a)	0	0	-100.0	-
25 years and over	0	0	(a)	(a)	0	0	-	-
Sub total[1]	**(a)**	**(a)**	**(a)**	**(a)**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
15 to 19 years	3120	2950	2960	3140	3470	3000	-0.8	-13.5
20 to 24 years	6540	6700	6600	6480	6640	6620	0.2	-0.3
25 years and over	1160	1300	1400	1380	1500	1490	5.1	-0.9
Sub total[1]	**10820**	**10950**	**10950**	**11000**	**11610**	**11110**	**0.5**	**-4.3**
4312 Refrigeration and airconditioning mechanics								
15 to 19 years	460	470	500	540	600	590	5.0	-2.3
20 to 24 years	780	830	860	940	980	1000	5.1	1.8
25 years and over	140	170	220	230	260	290	14.7	8.3
Sub total[1]	**1390**	**1470**	**1580**	**1710**	**1850**	**1880**	**6.2**	**1.4**
4313 Electrical distribution tradespersons								
15 to 19 years	90	80	60	40	60	50	-12.4	-21.7
20 to 24 years	310	310	280	270	220	190	-9.1	-13.4
25 years and over	150	120	100	90	90	80	-12.3	-13.2
Sub total[1]	**560**	**510**	**440**	**400**	**380**	**320**	**-10.5**	**-14.7**
4314 Electronics instrument tradespersons								
15 to 19 years	50	60	70	60	70	80	10.8	7.1
20 to 24 years	110	140	160	190	160	160	7.4	-4.3
25 years and over	50	80	80	100	80	70	5.5	-19.0
Sub total[1]	**210**	**280**	**310**	**350**	**320**	**300**	**7.7**	**-5.7**
4315 Electronics and office equipment tradesperson								
15 to 19 years	210	180	100	70	80	90	-15.3	11.1
20 to 24 years	630	530	410	300	210	160	-24.1	-23.2
25 years and over	110	80	100	70	50	40	-19.3	-25.0
Sub total[1]	**950**	**790**	**610**	**440**	**340**	**290**	**-21.3**	**-15.3**
4316 Communications tradespersons								
15 to 19 years	30	60	70	90	100	90	27.1	-5.1
20 to 24 years	80	100	150	170	190	200	21.0	4.2
25 years and over	20	20	40	60	90	60	28.1	-34.0
Sub total[1]	**120**	**180**	**260**	**310**	**380**	**350**	**23.6**	**-7.6**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
15 to 19 years	440	480	430	410	430	390	-2.3	-7.5
20 to 24 years	690	820	870	990	1010	1090	9.6	7.5
25 years and over	180	200	210	250	260	300	10.4	17.6
Sub total[1]	**1320**	**1490**	**1510**	**1640**	**1700**	**1780**	**6.3**	**5.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
15 to 19 years	4390	4270	4200	4350	4830	4320	-0.3	-10.5
20 to 24 years	9150	9440	9350	9370	9460	9500	0.7	0.4
25 years and over	1830	1960	2160	2190	2360	2380	5.4	0.7
TOTAL[1]	**15370**	**15670**	**15700**	**15920**	**16660**	**16200**	**1.0**	**-2.7**
9918 Electrical and telecommunications trades assistants								
15 to 19 years	*30*	*140*	*150*	*180*	*230*	*190*	*45.9*	*-17.6*
20 to 24 years	*30*	*90*	*140*	*170*	*200*	*210*	*47.3*	*4.5*
25 years and over	*20*	*60*	*70*	*200*	*210*	*180*	*61.5*	*-16.2*
Sub total[1]	*80*	*290*	*350*	*550*	*640*	*580*	*50.3*	*-10.3*

* Annual rates of growth are compound growth rates

[1] Totals may include ages other than those in the range 15 to 64

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

AQF level

This section focuses on trends in commencements and numbers in training from 1995 to 2000 by Australian Qualification Framework (AQF) level.

For commencements (table 11):

- In 2000, AQF Certificate III and higher level commencements in all the selected electrical and electronics trades (excluding electrical and telecommunications trades assistants), dropped to the same level as in 1995 (4,750 in 1995 and 4,760 in 2000). This marks the end of a period of steady growth in AQF Certificate III and higher commencements, with a high of 5,910 commencements reached in 1999. From 1999 to 2000 AQF III and higher commencements dropped by 19.5%.
- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, AQF Certificate II and lower level commencements grew strongly in terms of growth rate but comprised an insignificant number of commencements (less than 10 in 1995 rising to 110 in 2000).
- The number of commencements at AQF Certificate level I and II were insignificant for all 4-digit occupations except electronics and office equipment tradespersons (where they have grown to 50 over the period 1995 to 2000 and electronics, now comprising about 30% of all commencements in that trade).
- The electrical and telecommunications trades assistants occupation experienced strong growth in the number of AQF Certificate I and II level commencements, from 70 in 1995 to 730 in 1999, however the number fell to 480 in 2000. AQF Certificate III and higher level commencements rose to 90 for both 1999 and 2000.

For the number in training (table 12):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, AQF Certificate III and higher level numbers in training rose from 13,980 in 1995 to 15,880 in 2000 with an annual growth rate of 2.6%.
- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, AQF Certificate II and lower level numbers in training grew strongly in terms of growth rate but comprised an insignificant number in training (10 in 1995 rising to 230 in 2000).
- The number in training at AQF Certificate level I and II was insignificant for all 4-digit occupations except for communications tradespersons (where they grew to 70 over the period 1995 to 2000 and electronics and office equipment tradespersons (where they grew to 40 over the period 1995 to 2000.
- The electrical and telecommunications trades assistants occupation experienced strong growth in the number in training at AQF Certificate I and II levels, from 70 in 1995 to 550 in 1999, although there was a slight decline during 2000. The number in training at AQF Certificate III and higher levels has grown to 160 in 2000.

Table 11: Electrical and electronics trade commencements by AQF qualification, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
Certificate I & II	0	0	0	0	0	0	-	-
Cert. III & higher	(a)	(a)	30	20	40	90	58.5	125.0
Not known	(a)	(a)	0	0	0	0	-100.0	-
Sub total	**10**	**(a)**	**30**	**20**	**40**	**90**	**49.6**	**125.0**
3124-13 Electronics engineering technician								
Certificate I & II	0	0	0	0	0	0	-	-
Cert. III & higher	(a)	(a)	0	0	0	0	-100.0	-
Not known	0	0	0	0	0	0	-	-
Sub total	**(a)**	**(a)**	**0**	**0**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
Certificate I & II	(a)	(a)	(a)	0	(a)	0	-100.0	-100.0
Cert. III & higher	3270	3070	3280	3670	4140	3100	-1.1	-25.2
Not known	140	90	70	0	0	0	-100.0	-
Sub total	**3410**	**3160**	**3360**	**3670**	**4140**	**3100**	**-1.9**	**-25.2**
4312 Refrigeration and airconditioning mechanics								
Certificate I & II	0	0	0	50	40	(a)	-	-93.2
Cert. III & higher	490	440	550	550	660	570	3.1	-12.9
Not known	10	(a)	20	0	0	0	-100.0	-
Sub total	**500**	**450**	**570**	**600**	**700**	**580**	**2.7**	**-18.0**
4313 Electrical distribution tradespersons								
Certificate I & II	0	0	(a)	(a)	(a)	0	-	-100.0
Cert. III & higher	140	110	110	120	130	80	-10.4	-36.4
Not known	0	(a)	(a)	0	0	0	-	-
Sub total	**140**	**110**	**120**	**120**	**130**	**80**	**-10.4**	**-38.3**
4314 Electronics instrument tradespersons								
Certificate I & II	0	0	0	0	(a)	(a)	-	800.0
Cert. III & higher	90	70	80	100	120	80	-1.4	-29.7
Not known	0	0	(a)	0	0	0	-	-
Sub total	**90**	**70**	**90**	**100**	**120**	**90**	**0.7**	**-22.7**
4315 Electronics and office equipment tradesperson								
Certificate I & II	0	40	70	50	70	50	-	-35.7
Cert. III & higher	270	180	80	100	100	110	-16.3	12.2
Not known	20	20	(a)	0	0	0	-100.0	-
Sub total	**290**	**240**	**150**	**150**	**170**	**160**	**-11.5**	**-7.7**
4316 Communications tradespersons								
Certificate I & II	0	(a)	30	50	120	30	-	-72.2
Cert. III & higher	50	80	90	70	110	120	18.2	1.9
Not known	(a)	(a)	(a)	(a)	0	0	-100.0	-
Sub total	**60**	**90**	**120**	**120**	**230**	**150**	**20.7**	**-36.2**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
Certificate I & II	(a)	(a)	0	(a)	(a)	20	39.3	950.0
Cert. III & higher	430	510	360	520	610	610	7.2	-0.8
Not known	130	80	70	(a)	0	0	-100.0	-
Sub total	**560**	**590**	**440**	**520**	**610**	**630**	**2.2**	**2.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
Certificate I & II	(a)	40	100	150	240	110	79.3	-54.1
Cert. III & higher	4750	4460	4590	5150	5910	4760	0.0	-19.5
Not known	310	210	180	(a)	0	0	-100.0	-
TOTAL	**5070**	**4710**	**4870**	**5300**	**6150**	**4870**	**-0.8**	**-20.8**
9918 Electrical and telecommunications trades assistants								
Certificate I & II	*70*	*300*	*380*	*590*	*730*	*480*	*45.2*	*-34.3*
Cert. III & higher	*0*	*(a)*	*(a)*	*10*	*90*	*90*	-	*3.3*
Not known	*(a)*	*20*	*30*	*(a)*	*0*	*0*	*-100.0*	-
Sub total	*80*	*330*	*410*	*610*	*820*	*570*	*47.4*	*-30.2*

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 12: Electrical and electronics trade number in training by AQF qualification, 31 December 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
Certificate I & II	0	0	0	0	0	0	-	-
Cert. III & higher	20	10	40	60	90	170	56.9	101.2
Not known	(a)	(a)	(a)	(a)	(a)	0	-100.0	-100.0
Sub total	**20**	**20**	**40**	**60**	**90**	**170**	**49.4**	**98.8**
3124-13 Electronics engineering technician								
Certificate I & II	0	0	0	0	0	0	-	-
Cert. III & higher	(a)	(a)	(a)	(a)	0	0	-100.0	-
Not known	0	0	0	0	0	0	-	-
Sub total	**(a)**	**(a)**	**(a)**	**(a)**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
Certificate I & II	(a)	(a)	(a)	0	0	0	-100.0	-
Cert. III & higher	10170	10490	10690	10870	11530	11070	1.7	-4.0
Not known	650	450	260	140	80	40	-43.3	-51.3
Sub total	**10820**	**10950**	**10950**	**11000**	**11610**	**11110**	**0.5**	**-4.3**
4312 Refrigeration and airconditioning mechanics								
Certificate I & II	(a)	0	0	80	110	90	145.4	-15.2
Cert. III & higher	1350	1440	1540	1600	1720	1770	5.6	2.8
Not known	40	30	40	30	20	10	-17.2	-33.3
Sub total	**1390**	**1470**	**1580**	**1710**	**1850**	**1880**	**6.2**	**1.4**
4313 Electrical distribution tradespersons								
Certificate I & II	0	0	(a)	(a)	(a)	(a)	-	0.0
Cert. III & higher	540	490	430	400	370	320	-10.3	-14.9
Not known	20	10	(a)	(a)	0	0	-100.0	-
Sub total	**560**	**510**	**440**	**400**	**380**	**320**	**-10.5**	**-14.7**
4314 Electronics instrument tradespersons								
Certificate I & II	0	0	0	0	(a)	(a)	-	800.0
Cert. III & higher	210	280	310	350	320	290	7.2	-8.2
Not known	(a)	0	(a)	(a)	0	0	-100.0	-
Sub total	**210**	**280**	**310**	**350**	**320**	**300**	**7.7**	**-5.7**
4315 Electronics and office equipment tradesperson								
Certificate I & II	0	30	60	40	60	40	-	-34.5
Cert. III & higher	880	700	540	390	280	250	-22.2	-11.0
Not known	70	50	10	(a)	(a)	0	-100.0	-100.0
Sub total	**950**	**790**	**610**	**440**	**340**	**290**	**-21.3**	**-15.3**
4316 Communications tradespersons								
Certificate I & II	0	(a)	20	40	110	70	-	-34.6
Cert. III & higher	90	150	220	260	270	280	26.8	4.1
Not known	40	30	10	(a)	(a)	0	-100.0	-100.0
Sub total	**120**	**180**	**260**	**310**	**380**	**350**	**23.6**	**-7.6**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
Certificate I & II	(a)	(a)	(a)	10	(a)	20	19.6	266.7
Cert. III & higher	730	1070	1200	1460	1610	1730	18.7	7.0
Not known	570	420	310	170	80	40	-42.8	-53.3
Sub total	**1320**	**1490**	**1510**	**1640**	**1700**	**1780**	**6.3**	**5.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
Certificate I & II	10	40	90	180	280	230	81.0	-17.4
Cert. III & higher	13980	14630	14980	15390	16190	15880	2.6	-2.0
Not known	1390	1000	640	350	180	90	-42.5	-51.4
TOTAL	**15380**	**15670**	**15710**	**15920**	**16660**	**16200**	**1.0**	**-2.7**
9918 Electrical and telecommunications trades assistants								
Certificate I & II	*70*	*270*	*320*	*530*	*550*	*420*	*43.6*	*-25.0*
Cert. III & higher	*0*	*(a)*	*(a)*	*10*	*90*	*160*	-	*80.9*
Not known	*(a)*	*20*	*30*	*(a)*	*0*	*0*	*-100.0*	-
Sub total	*80*	*290*	*350*	*550*	*640*	*580*	*50.3*	*-10.3*

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive Source: NCVER, March 2001

Expected duration

This section focuses on trends in numbers in training from 1995 to 2000 by expected duration of apprentice and trainee contracts (table 13).

- For all selected electrical and electronics trade occupations considered together (excluding electrical and telecommunications trades assistants), the number of apprentices and trainees undertaking contracts of training of more than 2 years duration increased from 14,270 in 1995 to 15,520 in 2000, with an annual rate of growth of 1.7%. They continue to dominate the total number in training, comprising 95.8% of all contracts in 2000.
- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, the number of apprentices and trainees undertaking contracts of training of 2 years or less declined from 1,110 in 1995 to 680 in 2000, with most of the decline occurring during 2000.
- The electrical and telecommunications trades assistants occupation experienced strong growth in the number in training for contracts of 2 years duration or less. The number in training in contracts of more than 2 years comprised an insignificant number in training in this occupation.

Table 13: Electrical and electronics trade number in training by expected duration, 31 December 1995 to 2000

	Number						Annual growth rate* 1995 – 2000 (%)	Growth 1999 - 2000 (%)
	1995	1996	1997	1998	1999	2000		
3123 Electrical engineering associate professionals								
2 years or less	(a)	(a)	(a)	(a)	(a)	20	32.0	166.7
More than 2 years	20	10	40	60	80	160	52.2	93.8
Sub total	**20**	**20**	**40**	**60**	**90**	**170**	**49.4**	**98.8**
3124-13 Electronics engineering technician								
2 years or less	0	(a)	0	0	0	0	-	-
More than 2 years	(a)	(a)	(a)	(a)	0	0	-100.0	-
Sub total	**(a)**	**(a)**	**(a)**	**(a)**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
2 years or less	820	740	640	750	680	360	-15.3	-47.8
More than 2 years	10000	10200	10310	10250	10930	10750	1.5	-1.6
Sub total	**10820**	**10950**	**10950**	**11000**	**11610**	**11110**	**0.5**	**-4.3**
4312 Refrigeration and airconditioning mechanics								
2 years or less	100	120	120	120	120	70	-6.4	-39.3
More than 2 years	1280	1350	1460	1590	1730	1800	7.0	4.3
Sub total	**1390**	**1470**	**1580**	**1710**	**1850**	**1880**	**6.2**	**1.4**
4313 Electrical distribution tradespersons								
2 years or less	30	20	(a)	(a)	10	(a)	-36.5	-72.7
More than 2 years	530	490	430	400	360	320	-9.7	-12.9
Sub total	**560**	**510**	**440**	**400**	**380**	**320**	**-10.5**	**-14.7**
4314 Electronics instrument tradespersons								
2 years or less	10	20	20	40	40	20	12.1	-41.0
More than 2 years	190	260	290	310	280	280	7.4	-0.7
Sub total	**210**	**280**	**310**	**350**	**320**	**300**	**7.7**	**-5.7**
4315 Electronics and office equipment tradesperson								
2 years or less	70	100	100	90	100	50	-5.9	-46.3
More than 2 years	880	690	510	350	250	240	-23.1	-3.3
Sub total	**950**	**790**	**610**	**440**	**340**	**290**	**-21.3**	**-15.3**
4316 Communications tradespersons								
2 years or less	(a)	10	50	60	120	80	55.6	-31.1
More than 2 years	110	170	210	250	260	270	19.0	3.1
Sub total	**120**	**180**	**260**	**310**	**380**	**350**	**23.6**	**-7.6**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
2 years or less	70	80	70	120	100	70	0.0	-26.5
More than 2 years	1240	1410	1440	1520	1600	1710	6.6	7.2
Sub total	**1320**	**1490**	**1510**	**1640**	**1700**	**1780**	**6.3**	**5.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
2 years or less	1110	1090	1010	1190	1170	680	-9.5	-42.2
More than 2 years	14270	14580	14700	14720	15480	15520	1.7	0.2
Sub total	**15380**	**15670**	**15710**	**15920**	**16660**	**16200**	**1.0**	**-2.7**
9918 Electrical and telecommunications trades assistants								
2 years or less	*80*	*290*	*340*	*530*	*610*	*540*	*48.1*	*-12.2*
More than 2 years	*0*	*0*	*(a)*	*10*	*30*	*40*	-	*24.2*
Sub total	*80*	*290*	*350*	*550*	*640*	*580*	*50.3*	*-10.3*

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Full time status

This section focuses on trends in commencements and numbers in training from 1995 to 2000 by full time status.

For commencements (table 14):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, the number of apprentices and trainees who commenced a full time contract rose slightly from 4,680 in 1995 to 4,810 in 2000 at an annual compound growth rate of 0.6%. Those commencing a part time contract decreased from 90 in 1995 to 60 in 2000.
- The number of commencements in part time contracts were insignificant for all 4-digit occupations. The biggest growth occurred for electricians where they have grown to 40 in 2000. The biggest decline occurred for electrical distribution tradespersons where they declined from 60 in 1995 to zero in 2000.
- The number of part time contracts in the electrical and telecommunications trades assistants occupations comprised an insignificant proportion of all commencements for each year 1995 to 2000.

For the number in training (table 15):

- For all the selected electrical and electronics trades together but excluding electrical and telecommunications trades assistants, the number of apprentices and trainees in training in a full time contract rose from 14,190 in 1995 to 15,850 in 2000 at an annual compound growth rate of 2.2%. The number in a part time contract have almost halved in the same period of time, from 250 in 1995 to 140 in 2000.
- In 2000, the number in part time contracts were insignificant for all 4-digit occupations. The biggest growth occurred for electricians where they have grown to 60 over the period 1995 to 2000. The biggest decline occurred for electrical distribution tradespersons where they declined from 180 in 1995 to 40 in 2000.
- The number of part time contracts in the electrical and telecommunications trades assistants occupations comprised an insignificant proportion of all numbers in training for each year 1995 to 2000.

Table 14: Electrical and electronics trade commencements by full time status, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
Full time	10	(a)	30	20	40	90	49.6	125.0
Part time	0	0	0	0	0	0	-	-
Not known	0	0	0	0	0	0	-	-
Sub total	**10**	**(a)**	**30**	**20**	**40**	**90**	**49.6**	**125.0**
3124-13 Electronics engineering technician								
Full time	(a)	(a)	0	0	0	0	-100.0	-
Part time	0	0	0	0	0	0	-	-
Not known	0	0	0	0	0	0	-	-
Sub total	**(a)**	**(a)**	**0**	**0**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
Full time	3320	3050	3260	3610	4110	3060	-1.6	-25.4
Part time	0	0	(a)	10	40	40	-	2.8
Not known	90	110	90	50	0	0	-100.0	-
Sub total	**3410**	**3160**	**3360**	**3670**	**4140**	**3100**	**-1.9**	**-25.2**
4312 Refrigeration and airconditioning mechanics								
Full time	470	430	530	590	700	570	3.8	-18.2
Part time	20	(a)	10	(a)	(a)	(a)	-17.8	20.0
Not known	20	10	30	(a)	0	0	-100.0	-
Sub total	**500**	**450**	**570**	**600**	**700**	**580**	**2.7**	**-18.0**
4313 Electrical distribution tradespersons								
Full time	80	70	70	100	130	80	-0.2	-38.3
Part time	60	30	40	20	0	0	-100.0	-
Not known	0	(a)	(a)	0	0	0	-	-
Sub total	**140**	**110**	**120**	**120**	**130**	**80**	**-10.4**	**-38.3**
4314 Electronics instrument tradespersons								
Full time	90	70	80	90	120	90	0.4	-22.9
Part time	0	0	0	(a)	(a)	(a)	-	0.0
Not known	0	0	(a)	(a)	0	0	-	-
Sub total	**90**	**70**	**90**	**100**	**120**	**90**	**0.7**	**-22.7**
4315 Electronics and office equipment tradesperson								
Full time	280	230	150	140	160	150	-12.4	-7.1
Part time	(a)	(a)	0	(a)	10	10	20.1	-16.7
Not known	(a)	(a)	0	0	0	0	-100.0	-
Sub total	**290**	**240**	**150**	**150**	**170**	**160**	**-11.5**	**-7.7**
4316 Communications tradespersons								
Full time	60	90	120	120	230	150	20.2	-37.3
Part time	0	(a)	0	(a)	(a)	(a)	-	215.8
Not known	0	0	0	0	0	0	-	-
Sub total	**60**	**90**	**120**	**120**	**230**	**150**	**20.7**	**-36.2**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
Full time	360	420	320	500	610	630	11.6	2.3
Part time	(a)	(a)	(a)	(a)	0	0	-100.0	-
Not known	190	160	110	30	0	0	-100.0	-
Sub total	**560**	**590**	**440**	**520**	**610**	**630**	**2.2**	**2.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
Full time	4680	4370	4570	5180	6100	4810	0.6	-21.1
Part time	90	50	60	40	60	60	-8.1	5.1
Not known	300	290	240	90	0	0	-100.0	-
TOTAL	**5070**	**4710**	**4870**	**5300**	**6150**	**4870**	**-0.8**	**-20.8**
9918 Electrical and telecommunications trades assistants								
Full time	*70*	*290*	*340*	*590*	*800*	*570*	*50.2*	*-28.9*
Part time	*0*	*20*	*30*	*(a)*	*20*	*(a)*	-	*-73.9*
Not known	*(a)*	*20*	*50*	*10*	*0*	*0*	*-100.0*	-
Sub total	*80*	*330*	*410*	*610*	*820*	*570*	*47.4*	*-30.2*

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Table 15: Electrical and electronics trade number in training by full time status, 31 December 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
3123 Electrical engineering associate professionals								
Full time	20	20	40	60	90	170	49.4	98.8
Part time	0	0	0	0	0	0	-	-
Not known	0	0	0	0	0	0	-	-
Sub total	**20**	**20**	**40**	**60**	**90**	**170**	**49.4**	**98.8**
3124-13 Electronics engineering technician								
Full time	(a)	(a)	(a)	(a)	0	0	-100.0	-
Part time	0	0	0	0	0	0	-	-
Not known	0	0	0	0	0	0	-	-
Sub total	**(a)**	**(a)**	**(a)**	**(a)**	**0**	**0**	**-100.0**	**-**
4311 Electricians								
Full time	10590	10660	10660	10720	11390	10940	0.7	-3.9
Part time	0	0	(a)	10	40	60	-	74.3
Not known	230	290	290	270	190	110	-14.5	-44.7
Sub total	**10820**	**10950**	**10950**	**11000**	**11610**	**11110**	**0.5**	**-4.3**
4312 Refrigeration and airconditioning mechanics								
Full time	1310	1390	1480	1630	1790	1840	7.1	2.6
Part time	50	40	40	30	20	20	-20.8	-25.0
Not known	30	40	60	50	40	20	-7.8	-44.4
Sub total	**1390**	**1470**	**1580**	**1710**	**1850**	**1880**	**6.2**	**1.4**
4313 Electrical distribution tradespersons								
Full time	360	320	270	270	300	280	-4.8	-5.7
Part time	180	180	170	130	80	40	-27.3	-50.7
Not known	10	10	(a)	(a)	0	0	-100.0	-
Sub total	**560**	**510**	**440**	**400**	**380**	**320**	**-10.5**	**-14.7**
4314 Electronics instrument tradespersons								
Full time	210	280	310	340	310	300	7.7	-4.8
Part time	0	0	0	(a)	(a)	(a)	-	100.0
Not known	(a)	0	(a)	(a)	(a)	0	-100.0	-100.0
Sub total	**210**	**280**	**310**	**350**	**320**	**300**	**7.7**	**-5.7**
4315 Electronics and office equipment tradesperson								
Full time	930	770	600	430	330	270	-21.8	-16.3
Part time	10	10	(a)	(a)	10	20	6.4	7.1
Not known	(a)	(a)	(a)	(a)	0	0	-100.0	-
Sub total	**950**	**790**	**610**	**440**	**340**	**290**	**-21.3**	**-15.3**
4316 Communications tradespersons								
Full time	120	180	260	310	380	350	23.3	-8.4
Part time	0	(a)	0	(a)	(a)	(a)	-	300.0
Not known	0	0	0	(a)	0	0	-	-
Sub total	**120**	**180**	**260**	**310**	**380**	**350**	**23.6**	**-7.6**
Other 43 Electrical & electronics tradespersons not known at 4-digit level								
Full time	640	910	1040	1290	1490	1700	21.4	13.8
Part time	(a)	10	20	20	(a)	(a)	-15.0	-50.0
Not known	660	570	460	340	200	90	-33.7	-56.9
Sub total	**1320**	**1490**	**1510**	**1640**	**1700**	**1780**	**6.3**	**5.3**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS								
Full time	14190	14530	14650	15050	16070	15850	2.2	-1.4
Part time	250	240	240	200	150	140	-11.2	-10.4
Not known	940	910	820	670	430	210	-25.9	-50.8
TOTAL	**15380**	**15670**	**15710**	**15920**	**16660**	**16200**	**1.0**	**-2.7**
9918 Electrical and telecommunications trades assistants								
Full time	*70*	*260*	*280*	*530*	*620*	*560*	*52.3*	*-10.3*
Part time	*0*	*10*	*30*	*(a)*	*20*	*20*	-	*-9.5*
Not known	*(a)*	*20*	*50*	*20*	*0*	*0*	*-100.0*	-
Sub total	*80*	*290*	*350*	*550*	*640*	*580*	*50.3*	*-10.3*

* Annual rates of growth are compound growth rates

(a) Represents figures between 1 and 9 inclusive

Source: NCVER, March 2001

Geographic region by State/Territory

This section focuses on trends in commencements from 1995 to 2000 by geographic region of the residential location of apprentices and trainees by State/Territory for electrical and electronics trades (excluding 9918 electrical and telecommunications trades assistants, table 16).

- Looking at Australia as a whole for electrical and electronics trades and comparing 1995 with 2000, the numbers of commencements rose for apprentices and trainees residing in capital cities and in Australia's rural areas while numbers declined for apprentices and trainees who live in other metropolitan areas and in Australia's remote regions. It should be noted, however, that from 1999 and 2000 commencements in electrical and electronics trades apprenticeships and traineeships fell significantly across all major geographic regions.
- Over the period 1995 to 2000, there was a mix of growth and decline in electrical and electronics trade commencements across States and Territories. Victoria experienced the highest annual growth rate over the period 1995 to 2000 of 7.7%, from 1,010 commencements in 1995 to 1,470 in 2000.
- From 1999 to 2000 electrical and electronics trade commencements dropped in all States and Territories, except the Northern Territory (up 31.5%).

Table 16: Electrical & electronics trade* commencements by geographic region by State/Territory, 1995 to 2000

	Number						Annual growth rate*	Growth 1999 - 2000
	1995	1996	1997	1998	1999	2000	1995 – 2000 (%)	(%)
New South Wales								
Capital city	1050	1050	1140	1100	1330	690	-8.0	-47.7
Other metro.	250	290	250	200	210	170	-7.7	-22.3
Rural	330	300	300	340	340	260	-4.6	-23.5
Remote	10	(a)	(a)	(a)	10	(a)	-14.5	-49.7
Total[1]	**1910**	**1750**	**1740**	**1680**	**1920**	**1140**	**-9.8**	**-40.5**
Victoria								
Capital city	750	610	700	820	940	1070	7.2	13.3
Other metro.	30	30	20	40	40	30	-0.7	-26.3
Rural	220	200	220	250	460	340	9.6	-25.3
Remote	(a)	(a)	(a)	(a)	(a)	(a)	38.0	25.0
Total[1]	**1010**	**840**	**960**	**1120**	**1470**	**1470**	**7.7**	**-0.1**
Queensland								
Capital city	420	390	440	510	630	440	0.9	-30.0
Other metro.	150	120	110	150	200	140	-1.8	-31.0
Rural	370	390	360	430	510	370	-0.3	-27.3
Remote	110	110	120	80	100	90	-4.9	-18.3
Total[1]	**1070**	**1010**	**1040**	**1190**	**1450**	**1040**	**-0.5**	**-28.5**
Western Australia								
Capital city	300	360	360	400	430	390	5.3	-9.0
Other metro.	0	0	0	0	0	0	-	-
Rural	100	90	120	100	120	90	-2.3	-22.4
Remote	80	80	100	100	80	90	4.1	12.0
Total[1]	**490**	**530**	**580**	**610**	**630**	**580**	**3.5**	**-8.9**
South Australia								
Capital city	210	220	200	290	300	270	5.3	-10.7
Other metro.	0	0	0	0	0	0	-	-
Rural	80	80	70	90	70	90	2.3	24.3
Remote	10	(a)	(a)	(a)	10	(a)	-16.7	-60.0
Total[1]	**300**	**300**	**280**	**390**	**390**	**360**	**3.9**	**-5.7**
Tasmania								
Capital city	50	50	50	40	60	50	-0.8	-7.1
Other metro.	0	0	0	0	0	0	-	-
Rural	50	50	50	60	70	50	1.2	-26.4
Remote	(a)	(a)	(a)	0	(a)	(a)	0.0	100.0
Total[1]	**110**	**100**	**100**	**100**	**130**	**110**	**0.0**	**-17.1**
Northern Territory								
Capital city	50	50	40	60	30	50	2.9	65.6
Other metro.	0	0	0	0	0	0	-	-
Rural	(a)	10	(a)	10	(a)	10	4.1	57.1
Remote	40	70	50	30	30	30	-5.9	-8.8
Total[1]	**100**	**120**	**100**	**110**	**70**	**100**	**-0.4**	**31.5**
Australian Capital Territory								
Capital city	90	50	60	110	80	80	-2.2	-6.1
Other metro.	(a)	0	(a)	0	0	0	-100.0	-
Rural	0	(a)	(a)	0	0	0	-	-
Remote	0	0	0	0	0	0	-	-
Total[1]	**90**	**50**	**60**	**120**	**90**	**80**	**-1.6**	**-12.8**
AUSTRALIA								
Capital city	2930	2770	2980	3340	3800	3050	0.8	-19.9
Other metro.	430	430	390	390	450	330	-5.0	-26.5
Rural	1160	1110	1130	1270	1580	1220	0.9	-22.7
Remote	250	280	280	230	250	230	-2.2	-8.5
Total[1]	**5070**	**4710**	**4870**	**5300**	**6150**	**4870**	**-0.8**	**-20.8**

Source: NCVER, March 2001

* Excluding 9918 electrical and telecommunications trades assistants

** Annual rates of growth are compound growth rates

[1] Totals include other regions such as interstate and outside Australia and may include unknown information

(a) Represents figures between 1 and 9 inclusive

School attendance status

This section looks at commencements from 1998 to 2000 by school attendance status of apprentices and trainees (table 17).

- For all selected electrical and electronics trade occupations considered together (excluding electrical and telecommunications trades assistants), the number of apprentices and trainees who commenced their apprenticeship or traineeship while still attending school was 20 for 1998, 70 in 1999 and 60 in 2000. These comprised an insignificant proportion of all commencements.
- For the electrical and telecommunications trade assistants occupation, the number of apprentices and trainees who commenced their apprenticeship or traineeship while still attending school comprised an insignificant proportion for each year 1998 to 2000.

Table 17: Electrical and electronics trade commencements by school attendance status, 1998 to 2000

	Number		
	1998	1999	2000
3123 Electrical engineering associate professionals			
Still attending school	0	0	0
Finished school	20	40	90
Not known	(a)	(a)	(a)
Sub total	**20**	**40**	**90**
3124-13 Electronics engineering technician			
Still attending school	0	0	0
Finished school	0	0	0
Not known	0	0	0
Sub total	**0**	**0**	**0**
4311 Electricians			
Still attending school	20	60	50
Finished school	3320	2950	2000
Not known	340	1140	1050
Sub total	**3670**	**4140**	**3100**
4312 Refrigeration and airconditioning mechanics			
Still attending school	0	(a)	(a)
Finished school	530	500	340
Not known	70	190	230
Sub total	**600**	**700**	**580**
4313 Electrical distribution tradespersons			
Still attending school	0	(a)	0
Finished school	120	130	60
Not known	(a)	(a)	30
Sub total	**120**	**130**	**80**
4314 Electronics instrument tradespersons			
Still attending school	(a)	(a)	(a)
Finished school	90	100	70
Not known	(a)	20	20
Sub total	**100**	**120**	**90**
4315 Electronics and office equipment tradesperson			
Still attending school	(a)	(a)	(a)
Finished school	130	130	130
Not known	10	30	20
Sub total	**150**	**170**	**160**
4316 Communications tradespersons			
Still attending school	0	(a)	(a)
Finished school	110	120	60
Not known	10	110	80
Sub total	**120**	**230**	**150**
Other 43 Electrical & electronics tradespersons not known at 4-digit level			
Still attending school	0	(a)	(a)
Finished school	420	450	450
Not known	100	160	180
Sub total	**520**	**610**	**630**
ALL ABOVE ELECTRICAL AND ELECTRONICS TRADESPERSONS			
Still attending school	20	70	60
Finished school	4730	4430	3190
Not known	560	1650	1610
TOTAL	**5300**	**6150**	**4870**
9918 Electrical and telecommunications trades assistants			
Still attending school	*(a)*	*20*	*(a)*
Finished school	*580*	*510*	*310*
Not known	*30*	*290*	*260*
Sub total	*610*	*820*	*570*

Source: NCVER, March 2001

(a) Represents figures between 1 and 9 inclusive

4.5 Other training

This section looks at the general vocational education and training (VET) student population in 1998 and 1999 for electrical and electronics trade occupations.

It should be noted that for the apprentice and trainee data presented elsewhere in this report, the ASCO code is based on apprentices' and trainees' declared vocation, that is, the actual job that they are employed in. The data presented in this section are based on occupation codes assigned to courses to indicate the most likely occupation relevant to each course. However, students undertaking a VET course may not be employed in the occupation assigned to the course, or even employed. It should also be remembered that students can enrol in more than one course.

The data in this section therefore provide the amount VET activity relevant to the electrical and electronics trade occupations. The difference between this and the previously given figures on apprentices and trainees can be viewed as a rough estimate of the amount of non-apprentice and non-trainee VET activity related to these occupations– regardless of whether or not this training is actually utilised in these occupations.

Indications are that somewhere around 36,000 students[3] (excluding electrical and telecommunications trades assistants) were enrolled in a VET course in 1999 relating to the electrical and electronics trade occupations (table 18). This suggests a slight decrease from 1998 where there were around 40,000 students (table 19).

Noting there was just over 16,500 apprentices and trainees at the end of 1999, indications are that around 19,500 students were enrolled in a non-apprentice or non-trainee VET course in 1999 relating to the electrical and electronics trade occupations.

Further, around 5,500 students were enrolled in a non-apprentice or non-trainee VET course in 1999 relating to electrical and telecommunications trades assistants occupations, a number similar to that in 1998.

[3] This number is based on the assumption that the majority of students enrol in a single course

Table 18: Electrical and electronics trades: Number of course enrolments by qualification (AQF), Australia 1999

	Diplomas	AQF Certificate IV and equivalent	AQF Certificate III and equivalent	AQF Certificates I and II	Other certificates, endorsements and other	Statements of Attainment	Non award courses	Total Enrolments
3123 Electrical Engineering Associate Professionals	2,410	1,090	690	60	0	(a)	140	4,390
3124-13 Electronics Engineering Technician	1,860	510	(a)	320	20	0	30	2,740
43 Electrical & Electronics Tradespersons	110	1,750	17,150	2,760	470	1,120	5,880	29,240
Sub Total	**4,370**	**3,350**	**17,840**	**3,140**	**490**	**1,120**	**6,050**	**36,360**
9918 Electrical & Telecommunications Trades Assistants	0	(a)	10	3,210	0	0	2,400	5,630

Source: NCVER 2000
(a) Represents figures between 1 and 9 inclusive

Table 19: Electrical and electronics trades: Number of course enrolments by qualification (AQF), Australia 1998

	Diplomas	AQF Certificate IV and equivalent	AQF Certificate III and equivalent	AQF Certificates I and II	Other certificates, endorsements and other	Statements of Attainment	Non award courses	Total Enrolments
3123 Electrical Engineering Associate Professionals	3,470	2,280	400	20	0	70	10	6,250
3124-13 Electronics Engineering Technician	240	840	(a)	290	40	30	0	1,440
43 Electrical & Electronics Tradespersons	130	2,460	17,090	2,500	2,790	4,660	3,390	33,010
Sub Total	**3,840**	**5,580**	**17,500**	**2,810**	**2,820**	**4,750**	**3,400**	**40,700**
9918 Electrical & Telecommunications Trades Assistants	0	0	30	2,550	430	50	2,590	5,640

Source: NCVER 2000
(a) Represents figures between 1 and 9 inclusive

Issues of skills shortages

Based on analytical work carried out the NCVER and the Department of Employment, Workplace Relations and Small Business (DEWRSB), the NCVER published a report of titled *Evidence of skill shortages in the electrotechnology trades*. In the report, it was concluded that some skill shortages were emerging in Australia's skilled electrotechnology trades.

Data supplied to NCVER by the Department of Employment, Workplace Relations and Small Business (DEWRSB) indicated that net migration and wastage from the electrotechnology trades in general is projected to be relatively low and lower than for trades generally. However, DEWRSB's skilled vacancy survey showed substantial growth in electrotechnology skilled vacancies during 1998 and 1999.

The report found that apprentice and trainee completions are not sufficient to supply all the projected employment growth and greater priority needs to be placed on training pathways outside of the new apprenticeship system.

The report also suggests that, in the future, employers in the electrotechnology trades will need to consider looking further than teenagers for new entrants as the number of young people aged 15 to 24 years will stagnate in the future. The report also suggests that even more critical than increasing numbers in training will be the issue of the relevance and quality of training for existing workers, as well as new entrants, to the electrotechnology trades to keep apace of the rapid technological changes in the industry.

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Appendix 1

Literature review

Introduction

In Australia, as elsewhere, most research in the field of vocational education and training has been driven by the perceived need to reform the public provision of training and therefore has focused on the supply side of the training market. Research on the demand side has primarily concentrated on the processes of training within the enterprise and the benefits to employers from an investment in training. To date, limited research has been conducted into the drivers of apprenticeship training per se.

Processes of training within the enterprise

Smith and Hayton (1999) conducted case studies of forty-two individual enterprises in five industry sectors: construction, electronics manufacturing, food processing, retail and finance. The analysis of the case studies identified a number of factors that appear to impact on the enterprise decision to train employees. These include:

- to improve employee performance;
- to improve the adaptability and flexibility of the workforce;
- investments in new technology;
- the adoption of new work practices and moves towards the more sophisticated systems of human resource management; and
- changes in business strategy.

Training drivers are those factors that immediately give rise to a demand for training within the enterprise. Several of the training drivers clearly identified in the case studies were workplace change, new technology and product innovation, and quality initiatives (such as total quality management). However there are other factors that appear to act as moderators by filtering the effects of training drivers, influencing the nature and extent of training activity. The main moderating effects include the size of the organization, the industry sector, the occupational structure, the training infrastructure, the commitment of senior management to training and industrial relations. Industrial relations processes, particularly award restructuring and enterprise bargaining, have emphasized the importance of training

Enterprise size

Enterprise size was strongly associated with both the volume and diversity of training. Smith and Hayton (1999) attribute this to the greater economies of scale that can be achieved in training by larger enterprises and the greater ability of a larger enterprise to provide internal, formal training and to support this training with high investments in training infrastructure. Larger enterprises have more skilled and professional employees who require higher levels of training. In contrast to smaller enterprises, larger enterprises often have well-developed networks with training providers and with training authorities.

Industry tradition of training

Industries have their own traditions of training that are expressed very clearly at the enterprise level and have considerable impact on the level of training provided. For example, in the construction industry there is a very strong tradition of apprentice training. Smith et al (1995) point out that this tradition of support for young tradespersons was most clearly articulated by managers in the building and construction enterprises. They themselves often worked their way up to positions of management from a trade background and felt it was their duty to the industry and to society at large to further the apprenticeship system within their own enterprises.

Occupational structure

Smith and Hayton (1999) identify that occupational structure is closely linked to initial vocational training and that different occupations clearly require different qualifications in terms of duration, content and level of post-school qualifications.

Entry-level training

From the firm's perspective, apprentice and trainee training is an important component of overall training. Kapuscinski (2000), using data from the ABS 1996 Training Expenditure Survey, calculated that in 1996 the direct expenditure on wages and salaries for people undertaking apprenticeship training, clerical training, labourer training and computer skills training amounted to $190m. The wage and salary costs of employee training in the four expenditure categories that encompass entry-level training accounted for almost 17 per cent of firms' overall expenditure on training. The bulk of entry level training occurs in the trade and apprentice training and clerical training expenditure categories. Each of these categories accounted for 5 per cent of firms' total expenditure on training.

Kapuscinski (2000) reports that apprenticeships and traineeships have become an increasingly attractive employment proposition for 15-24 year olds. The proportion of apprentices and trainees to people in the 15-24 year age group employed full time increased from just over 8 per cent in 1968 to 28 per cent in 1999. Over the same period, the proportion of apprentices to 15-24 year olds employed in total (either full or part-time) more than doubled.

Role of the business cycle

Kapuscinski (2000) reported preliminary findings of a model of entry-level training using data on the total number of contracts of training for entry-level trainees (ie the total stock of apprentices and trainees at a given point in time) from 1968 to 1998. The evidence from the model points to the significant impact of business cycles on the employment of apprentices and trainees. A rising unemployment rate leads to a fall in entry-level training and is positively related to both the vacancy rate and the employment-population ratio. These results demonstrate the importance of the state of the labour market on the growth of entry-level training.

Factors affecting provision of apprentice and trainee training

Analyses of factors affecting the provision of apprentice and trainee training by firms have been conducted by Kapuscinski (forthcoming) and Ball and Freeland (forthcoming). The study by Kapuscinski is an analysis of the 1993 and 1996 panels of the ABS Training Expenditure Survey and the Training Practices Survey. The study by Ball and Freeland utilises unit record level data from the ABS Business Longitudinal Survey (BLS) 1994-95 to 1997-98.

Both regression analyses provide evidence of the significant effect of a training culture on an employer's propensity to provide entry-level training.

A training culture can be defined in a number of ways, such as, Kapuscinski's (forthcoming) expenditure measure and business planning, and the decision-maker's commitment to training (Smith et al. [1996]).

There are three principal elements of a training culture in small and medium-sized enterprises that emerge from the analysis of the BLS by Ball and Freeland (forthcoming). These are:

- the training experiences of enterprise decision-makers;
- the effect of union membership on the provision of training; and
- the training practices of the enterprise.

The method of training delivery and the training providers used for training are both important influences in the creation of a training culture.

In addition to the influence of a training culture, Kapuscinski's research presents a set of factors that influence the provision of apprentice and traineeship training. The characteristics of firms found to affect the provision of entry-level training include:

- size of firm – exerts a positive influence on the provision of entry level training. Private for profit companies appear more likely to provide traineeships than other types of firms but are less likely to provide apprenticeships
- age of firm – the younger the firm the less likely it is to provide traineeships but the age of the firm has no influence on other categories of entry level training
- share of full-time and permanent employees –the higher the share of full-time employees the higher the probability of a firm providing entry level training
- competitiveness of the industry - the higher the concentration of an industry the lower the likelihood of provision of apprenticeships by a firm (ie those industries with very few firms operating are less likely to provide apprenticeships).

Ball and Freeland (forthcoming) investigated the impact of both training and non-training characteristics on the propensity of a firm to provide entry-level training.

'Non-training' enterprise characteristics

The 'non-training' enterprise characteristics that significantly influence the provision of entry-level training by a firm are:

- the industry in which the enterprise operates;
- the educational background of the decision-maker - enterprises with trade-educated decision-makers were more than 80% more likely than enterprises with university-educated decision-makers to provide such training;
- expanding levels of trade union membership among employees - while the level of union membership among workers of an enterprise is not a significant influence on the provision of apprentice and trainee training, enterprises with workforces which expanded their union membership between 1994–95 and 1997–98 were more likely to provide apprentice and trainee training than those enterprises whose workforces experienced declining or stable levels of union membership;
- the size of the enterprise (entry-level measure) - when compared to enterprises employing between 1 and 5 employees, enterprises with more than 20 employees are significantly more likely to provide apprentice and trainee training;
- increase in employment - enterprises that expanded total employment between 1994–95 and 1997–98 were significantly more likely to provide apprentice and trainee training than enterprises with stable or declining employment levels;

- level of full-time employment - enterprises with a high percentage of their workforce employed full-time are more likely to provide trade and apprenticeship and traineeship training than other firms; and
- increasing skills needs ratio (measured by the ratio of new employees to total employment) - enterprises with increasing skills needs ratios were 50 per cent more likely to provide apprentice and trainee training than other enterprises.

'Training' enterprise characteristics

Some training-based characteristics were found to significantly influence the provision of entry-level training. These are:

- training practices - the higher the percentage of employees receiving structured training (up to 75 per cent), the higher the likelihood that the enterprise would provide apprentice and trainee training. Enterprises that provide staff with on-the-job training are significantly more likely to provide apprentice and trainee training than other enterprises; and
- providers of training - enterprises that utilised either associations (professional and industry) or TAFE for training were significantly more likely to provide apprentice and trainee training than other enterprises. Enterprises using a university to provide training were significantly less likely to train trade apprentice and trainees than other enterprises.

An international perspective

The following summarises relevant research on apprenticeship training in the United Kingdom, Switzerland and Germany to provide an international perspective on the factors that influence the demand for apprentices.

The relationship that exists between the firm and the educational system is not a new concept. The roles shared by the firm and the college to train apprentices and trainees have been embedded in apprenticeship systems of many countries. Over the years, the participation of firms in apprenticeship training has constituted one of the major driving forces in training numbers.

United Kingdom

Enterprise training

According to a study conducted by the University of Warwick on the role of training at the enterprise level (Smith et al 1995), long-term commitment of the organisation to training can only be achieved by incorporating factors that set training in progress and factors that establish training within the enterprise.

Factors that set training in progress are associated with the strategy making process whereby organisations have to be more competitive in the labour market and need to incorporate training as part of the corporate strategy. Factors that establish training within the enterprise involve external factors (such as the availability of skills for the labour market, external support for training and legislative requirements) and internal factors (such as commitment from the executives, training infrastructure within the organisations and the organisation's budget).

Therefore, to encourage apprenticeship training in firms it is important to build the links between the training and strategy and the conditions in which they must exist in the organisation.

Modern Apprenticeships

In the United Kingdom the traditional apprenticeship system has undergone radical change since the early 1980s. The industrial relations and training reforms of the UK government during the 1980s and 1990s, together with the decline in the manufacturing industry, resulted in the almost complete disappearance of the traditional apprenticeship system in the late 1980s and early 1990s. In response to the severe decline in the apprenticeship system and the skills shortages that beset the UK economy in the 1990s, the modern apprenticeship system was introduced in 1995.

Modern apprenticeships (renamed 'advanced modern apprenticeships' in 2000) introduced structured training in new occupations which have not in the past been supported by traditional apprenticeships. Two years later, the UK government introduced the national traineeship scheme (renamed 'foundation modern apprenticeships' in 2000). The national traineeship scheme provides trainees with a broad range of work-based skills such as communication, problem solving, working with number and information technology. Following the completion of a national traineeship, candidates can continue working, enter full-time or part-time education or pursue a modern apprenticeship.

The modern apprenticeship system has apparently been successful. The number of apprentices undergoing training increased to over 217 thousand in March 2000 from 180 thousand in 1995. In addition to the growth in numbers of apprentices, non-traditional occupations such as business administration, retailing and hospitality now feature in the top five modern apprenticeship occupational categories (CEDEFOP 2000).

The drivers of employers' decisions to take on modern apprenticeships

The growth in training numbers is supported by the positive perception by employers of the modern apprenticeship initiatives. Kodz and associates (2000) conducted in-depth case studies with 49 employers from the business administration, construction, hospitality, information technology, motor and retail sectors. Analysis identified that employers believe that modern apprenticeships provide better opportunities to deliver quality training. However, the usefulness of each modern apprenticeship initiative was dependent of the sector of employment. For instance, employers in the retail sector believed that national traineeships or foundation modern apprenticeships were more useful programs, while employers in the motor vehicle service and repair sector preferred the modern apprenticeships or advanced modern apprenticeships.

Generally, employers in the UK are involved in apprenticeship training to continue their long established tradition of providing training for young people (Kodz et al 2000). However, employers from different sectors have different reasons for being involved in the training of apprentices. For example, many employers in the construction sector believe that modern apprenticeship initiatives provide good opportunities to train young people with the skills that meet the needs of the construction sector, while being eligible for funding from the government. On the other hand, employers in the information technology sector are taking on apprentices because of recruitment difficulties. Employment in information technology is varied in nature and spreads across a number of sectors. Hence the modern apprenticeship initiatives assist these employers to recruit appropriate future employees.

Kodz and associates (2000) found that the level of knowledge about apprenticeship training is associated with the size of the organisation. For instance, large employers in the business administration sector are involved in apprenticeship training to continue their historical involvement with youth training programs and to promote their corporate image and their reputation as good employers who provide training opportunities. Small employers on the hand, have a less strategic view of modern apprenticeships. Their involvement with apprenticeship training is usually at the suggestion of a young person wishing to take up an apprenticeship or through the marketing strategies of the training providers or colleges.

Barriers to take-up modern apprenticeships

Small and medium sized enterprises (SMEs) of less than 249 employees contribute a significant element to the UK economy. Approximately 3 in every 5 employees are employed by SMEs (Sims et al 2000). At the start of 1998, SMEs accounted for 99 per cent of the 3.7 million businesses. Therefore, the role of SMEs in training their employees will not only be essential for the growth of their businesses but also the UK economy. A study conducted by Sims and associates (2000) on 100 employers from the health and social care, information technology, road haulage and distribution, sports and recreation, arts and entertainment, printing and graphic, clothing manufacturing and international trade sectors found that SMEs are not taking on apprentices because of the SME business culture. SMEs do not have the capacity and infrastructure to support the use of apprenticeships and thereby prefer to recruit employees who are immediately productive.

The study identified that SMEs are not negative about the apprenticeship initiatives. Rather, they are reluctant to take on apprentices because of their limited understanding of the initiatives. SMEs indicated that the main barriers to take up apprentices also include lack of relevance and support. SMEs would take on apprentices if their businesses expanded. However, SMEs suggested that it is important to consult employers about the training needs so that the initiatives are more relevant and industry specific.

The Swiss dual system

During the industrial revolution, the number of people taking up apprenticeships declined dramatically and those who would normally have taken up an apprenticeship opted for a wage–earning job because the level of remuneration and working conditions were better.

During this time, small business was also concerned with issues arising from technological change, export orientation of textile and engineering sectors and the growing competition from foreign products. Small business called upon the Swiss Association of Industry to improve the situation. The Association decided to improve the situation by re–designing the apprenticeship system. The Swiss industry asked the central government authorities to subsidies for the establishment of further vocational training. As a result, the first government intervention in vocational training was implemented in 1884.

In 1930, the Federal Law on Vocational Training was passed. This Law mandated that on–the–job training was to be supplemented by compulsory school attendance. This system was also known as the 'dual system'. Although there have been revisions to this Law, the concept of apprenticeship training involving compulsory school attendance and on–the–job training is a strong feature of the Swiss apprenticeship system today (Gonon 1999).

Traditionally, the Swiss apprenticeship system was long considered to be the most effective method of training young people with the appropriate qualifications to the needs of employers. However, there has been a steady decline in the number of apprentices. Over the ten years from 1985 to 1995 there was a 30 per cent decrease in the number of apprentices in enterprises (Hanhart & Bossio 1998). Over the same period of time there was only an 8 per cent reduction in the total number of jobs. Hanhart & Bossio (1998) suggested that the down trend in the number of apprentices has been attributed to young people's inclination to consider university education, and the supply and demand of training.

In Switzerland, enterprises are not obligated to take on apprentices. However, 30 per cent of enterprises choose to be involved in apprenticeship training. In 1994, enterprises contributed 1.7 billion Swiss francs towards apprenticeship training. This figure represented 26 per cent of the total amount of spending on apprenticeship training and 0.5 per cent of Gross Domestic Products (GDP) in 1994 (Hanhart & Bossio 1998).

The drivers of employers' decisions to take on apprentices

Hanhart and Bossio (1998) conducted a study of 17 000 enterprises of different sizes to evaluate the effectiveness of the Swiss dual system. Based on analysis of the 900 enterprises that provided information regarding the cost of apprenticeships, they identified that small enterprises did not incur any net costs in apprenticeship training while medium and large enterprises incurred a net annual cost of 11 000 Swiss francs and 20 000 Swiss francs per apprentice, respectively. The net cost corresponds with the total costs of training an apprentice (that is, the apprentices' wages, time spent on training, administrative costs, costs of using machinery and premises for training) less the income generated by the training of apprentices.

The disparities in costs by enterprise size are related to apprentices' wages and the structure of costs. Young apprentices in small enterprises receive an annual wage of 5,500 Swiss francs as compared to 11,100 Swiss francs in medium-sized enterprises and 14,400 Swiss francs in large enterprises (Hanhart & Bossio, 1998). Furthermore, a large number of small enterprises were involved in training in the construction sector. Training in this sector involves relatively low costs compared to high training costs identified in the banking institutions or other technologically intensive sectors.

In Switzerland, small and medium sized enterprises account for 99 per cent of employment. Nevertheless, the distribution of apprentices by size of firm is evenly spread, with small, medium and large enterprises comprising 31 per cent, 33 per cent and 36 per cent of all apprenticeship training, respectively.

Responses from 3400 different sized enterprises indicated that enterprises were involved in apprenticeship training because there of a need for suitably skilled replacements for workers leaving the enterprise. The enterprises believe that the dual system yielded better skills than those taught by full-time vocational schooling. Enterprises were also providing apprenticeship training to improve the local availability of training and address the shortage of skilled labour on the market. Some enterprises were involved in apprenticeship training to continue their enterprise tradition and enhance their enterprises' image. In addition, enterprises believe that they could recruit new employees better by being familiar with their apprentices' performance. Training apprentices also assist enterprises to reduce the costs involved in the induction of newly recruited employees (Hanhart and Bossio 1998).

Reasons for ceasing apprenticeship training

In the Hanhart and Bossio (1998) study, enterprises indicated that they ceased apprenticeship training as they do not have the staff available to teach their apprentices. These enterprises also indicated that there are no in-house job opportunities to offer apprentices upon the completion of their training (Hanhart and Bossio 1998). Furthermore, high training costs and increasing complexity of regulations associated with apprenticeship were important factors for enterprises not wanting to be involved in apprenticeship training (Stalder 1999). In addition, enterprises were happy with the skilled workers that they have recruited from the open market.

In Switzerland, the reduction in the number of apprenticeship places is not related to employers' dissatisfaction with the quality and relevance of the training given to apprentices. Over the years, young people are losing interest in the dual apprenticeship system and enterprises are increasingly concerned about the time commitment required in training apprentices.

Apprenticeships in Germany

Germany has the most extensive and most studied apprenticeship system in the world. Based on a strong tradition of craft printing dating back to the middle ages, the modern German 'Dual System' is a product of the post-war reconstruction which established the consensual German industrial relations system and the employer financed apprenticeship system. The term 'dual system' refers to the fact that training in the German system is based on both practical training received in the workplace and theoretical education delivered through the vocational training schools.

The operation of the dual system involves employers, organised labour, school, chambers of commerce, trade associations and other government. Unlike the apprenticeship systems operating in the United Kingdom and Switzerland, Germany's employers are responsible for financing all aspects related to on-the-job training of apprentices. The employers pay training wages to their apprentices and fees to their chambers of commerce and trade associations. The fees paid to the chambers of commerce are used for supervising the functioning and quality of the dual system, while the fees paid to trade associations are used to research future skill needs. In 1999, the average cost of training an apprentice (including contributing factors) was DM 35 046 (CEDEFOP 1999).

The drivers of employers' decisions to take on apprentices

Germany's employers are not obligated to provide training. However, more than half of German employers participate in the dual system (Aring 1997). Employers participate in the dual system because the dual system is their only source of skilled workers. Participating in the dual system allows employers access to the best future workers with specific skills that meet their industry needs. Most importantly however, the federal law requires employers to hire only workers with the dual system certificate for jobs designated as an apprenticed position. Therefore, employers who train apprentices have the benefit of accessing skilled workers without having to pay the high costs associated with employing a skilled worker with a dual system certificate on the open market.

The level of employers' participation in the dual system increases with the size of the firm. In Germany, apprentices are more likely to be trained in large enterprises while the very small firms are less likely to participate in the dual system. Apprentices who were trained by large enterprises are more likely to be employed within the enterprise following the completion of their training (refer to following table).

Employer participation and trainee retention, by size of firm, 1985 (per cent)

Size	Firms with apprentices	Post-training retention rate
5-9 workers	35.0	56.0
10-49 workers	59.0	64.0
50-59 workers	78.0	69.0
100-499 workers	91.0	73.0
500-1000 workers	99.5	82.0
1000+ workers	99.6	87.0

Source: Gill and Dar (1996)

Appendix 2

Qualitative study - employer views on apprenticeships and traineeships in the electrotechnology industry

Introduction

NCVER was commissioned as part of the broader study to undertake a series of in-depth interviews with three groups of employers in the electrotechnology industry. These employer groups were:

- traditional trainers - those who have always employed apprentices and continue to do so;
- recent trainers – those who have taken on an apprentice in recent months; and
- non-trainers – those who have never employed an apprentice, or no longer do so.

The main purpose of the interviews was to identify the factors influencing an employer's decision to engage or not to engage an apprentice, as well as gaining an understanding of their attitudes and experiences while working with and training an apprentice.

The results from the in depth interviews have been used extensively in the development of the questionnaire for the quantitative stage of the project.

Methodology

Organisations in Brisbane and Sydney, and one from rural New South Wales, were interviewed, with the assistance and cooperation of the National Electrical Contractors Association (NECA). NECA selected names and contact details from its membership list and made initial contact to seek their agreement to be interviewed. With this agreement in place, NCVER then made an interview appointment.

Interviews were conducted face-to-face between 29 and 31 January 2001. The rural employer was interviewed by phone. The interviews were conducted either at the company office, on the work site or at the employer's home (their business base). A total of 17 interviews were conducted, 14 of these in enterprises ranging in size from sole trader to major employers. Seven traditional trainers were interviewed, two recent trainers, and five non-trainers. Three group training companies (GTC) were also selected for interview, one in Sydney and two in Brisbane.

In larger companies the person interviewed was usually involved with the hiring and monitoring of apprentices. Sole traders were interviewed directly. In the GTCs, NCVER spoke with a manager who was closely involved with recruitment and deployment of apprentices. A set of structured questions, developed by NCVER in consultation with DETYA, was used for each interview. A copy of the questions is at Appendix D.

Description of companies/businesses

As outlined previously 14 employers and three GTCs were interviewed. The characteristics of the companies or businesses associated with these employers varied as outlined below.

Sole traders and commercial companies

Size Companies ranged in size from small (from sole trader to nine employees) to medium (between 10 and 99 employees).

Sector Whilst all were electrical contractors their type of work ranged widely, including domestic, commercial and industrial construction, breakdown and maintenance, heating, cooling, pumping, lighting and data cabling.

Length of contract Work was obtained by word-of-mouth or by advertising, and was undertaken under a short or long term contract, or no contract at all (as in domestic repairs). Most had assured ongoing work, although one in Brisbane was waiting for a contract to come through.

Location Most of the selected companies were based in and operated throughout the broader metropolitan areas of Brisbane and Sydney; one was in central New South Wales. One who was based in the city often had contracts for work either interstate or internationally, for which they hired local workers.

Apprentices The number of apprentices engaged by any one contractor ranged from one to approximately 25, and collectively throughout the industry were spread across the four year levels.

Recruitment policy Most organisations had a recruitment 'policy' relating to taking on apprentices. This policy tended to be closely linked with the present and projected company workload and economic conditions or forecasts. In some instances employers in Sydney said that they tried to help out the NECA GTC if there was an apprentice needing a placement to maintain his continuity of experience. One employer said he sometimes tried to find extra work in these circumstances.

For some, the policy at the time of the interview was not to employ any first year apprentices this year, but to keep on apprentices already employed. For others, the policy was to continue to employ apprentices in all years, to ensure a steady supply of workers in the company. Most employers did not have to advertise for apprentices, but recruited from young people who had enquired about work with their company. Some employers tested possible apprentices while others did not.

Training policy The need for training tended to go hand-in hand with engaging an apprentice, although actual training policies tended not to be specifically defined in the contractor companies visited

Group Training Companies

Size see apprentices below

Sector All three GTCs operated in the electrical industry; one also operated in other industry sectors. The GTC interviewed in Sydney was formed by the industry association, NECA, and the two in Brisbane were private GTCs.

Length of contract The number of apprentices on the books of one GTC was not currently sufficient to meet employer demand. About 10-15 employers were currently on the waiting list for an apprentice; about 50-60 employers had been waiting last year during a time of peak demand. The GTC indicated that they were mindful not to engage numbers beyond the capacity of the industry to employ, especially in times of economic uncertainty. The other GTCs were actively seeking employers to take on apprentices to ensure that they did not have too long between placements. One GTC stated that they had to put in place a minimum requirement of one weeks employment for employers taking on an apprentice.

Location The GTCs selected were located in the city; such organisations are not necessarily available for employers in rural areas.

Apprentices The GTCs employed up to 150 apprentices, spread across the four year levels. These apprentices were hired by contractors for short or long periods and could also be engaged permanently at the end of their apprenticeship.

Recruitment policy The recruitment policy of the GTC varied between the three which were interviewed. The NECA GTC appeared to carefully regulate the number of apprentices it

took on, to ensure that it avoided the situation where it was unable to place its apprentices with contractors. At the time of interview, it had about 10-15 employers waiting for an apprentice.

On the other hand the GTC in Brisbane apparently had a ready supply of apprentices for whom they were actively seeking placement.

All three GTC put apprentice applicants through various tests before appointment, to ensure that they were of a suitable and of a standard which would enable them to cope with their TAFE training.

Training policy Training was an integral part of the operations of GTC. The organisations interviewed tended to be conscious of the need to ensure that their apprentices were trained across as wide as possible a range of industry skills.

Main findings from the qualitative component

Traditional employers

Why they employ apprentices

'Traditional' employers is the term given in this report to employers who have employed apprentices for many years. This group of employers was asked

why they have hired apprentices in the past and why they continue to do so. Their responses tended to fall into three broad categories: labour, costs and established practice.

Labour: Hiring apprentices each year was a way of ensuring a supply of labour for the firm, not only as junior employees but later as tradesmen on completion of their apprenticeship. Replacing staff lost through natural attrition was therefore a relatively straightforward matter.

In addition, apprentices who became long term employees provided the firm with staff 'trained in the company way', understanding company practices, and remaining loyal to the company over a long period of time. Some of the employers interviewed had built the company from very small and modest beginnings and continued to have a strong personal interest in the overall welfare of their employees. Others had remained small.

For both larger companies and for sole traders, hiring an apprentice provided much needed help on the job when it required more than one person. Those who directly employed their apprentices tended to keep the apprentice on for their full term, whereas those who employed through a GTC did not always do this. The flexibility to alter their labour force strength according to work needs was considered a distinct advantage for those who used GTCs. For some companies the GTC provided an important source of extra labour, rather than tying themselves to a four year commitment with an apprentice.

One GTC estimated that about 20% of their apprentices remained in the same company for the four years of their apprenticeship. Sole traders were often unable to keep on an apprentice as they progressed through their years of training, because such a practice would expand the business needlessly and/or increase costs. These employers may be inclined to replace an apprentice who had progressed to third or fourth year with a more junior one. Other employers stated that they only wanted apprentices in their second or third year, as the first years required too much time in training and the fourth years were too costly.

In country areas there were additional issues. A well trained apprentice on completion of his apprenticeship had the potential to either become a competitor or be poached by a larger company which doesn't train, whereas in the city a well trained graduate simply provided quality labour either in the same company, or in the industry generally.

Cost: Views on the cost of having an apprentice employee differed widely. Some employers considered that an apprentice was a cost advantage, allowing them to competitively quote for jobs (lower labour costs result from the averaging of a tradesman's and an apprentice's wage). These employers tended to the view that 'if they're not earning you money after the first few

months, you're not training them properly'. Having an apprentice could increase productivity, enable better customer service (shorter response time) and generally make the work a little easier.

Other employers were of the view that apprentices continue to be a cost liability throughout their years of employment. Training and supervision take time away from getting on with the job and reduce the flexibility which sole traders have in organising their work and personal time. Additional costs such as workers compensation were also a liability. It was considered that a fourth year apprentice costs as much as a fully qualified tradesman but still has to be supervised (by law). In such instances, employers would only continue to engage an apprentice for reasons other than cost (eg altruism – see below). Still others were in between these two extremes – they considered that whilst initially an apprentice was not cost effective, in later years they were. Other benefits, such as a much-needed extra hand and a potential tradesman trained in the 'company way', would outweigh the early disadvantages.

Established practice: Altruism was a driving force behind many traditional employers continuing to take on apprentices. A number of employers spoke of a need to 'put something back into the industry' as their reason for employing an apprentice. 'Someone took the time to train me, so I think I should do likewise' was another response. Other employers regarded taking on an apprentice as 'just the way things are done in the industry'. This industry and related industries commonly comprise tradesmen and apprentices, a structure which has existed throughout the history of the industry. Underlying such a structure, however, are cost and labour-related factors.

Many felt that apprentices were an important investment for the future of the industry, and also that apprentices added youth, vitality and new ideas to the workplace. For some taking on an apprentice had resulted from having been approached by a friend or colleague, or the young person or his relative. In the case of those employers working closely with the NECA GTC, they may be helping out GTC apprentices needing continuity of employment.

How they employ an apprentice

Traditional employers were asked how they employ apprentices. The two methods were *direct employment* and *through a GTC*. The type of apprenticeship could be either by indenture or as a trainee – the former type predominated.

By direct employment: Companies or sole traders who engaged apprentices directly almost never needed to advertise for new recruits. Several larger national companies (ie up to 100 employees) said they received numerous letters or phone enquiries during the year. These enquirers were then asked to lodge a follow-up formal application; interviews and selection according to specific criteria then followed. Some companies required their applicants to submit to an additional aptitude and ability test conducted by the NECA GTC, the results of which were input to the selection process.

One company reported that about 50% of those young people voluntarily seeking work with the company did not reach the interview stage. The tests which they were required to undergo were designed to prove whether or not they would be able to succeed at TAFE. The interview tended to identify and filter out those applicants whose attitude to work may be an impediment.

Smaller companies (ie less than 10 employees) tended to have a much more informal approach to recruitment, often initiated by word of mouth. Employers might hear of a young person who was interested in an apprenticeship. Providing the basic requirements had been met, usually at least Year 10 attained (though preferably Year 12) plus an aptitude for maths and science, and providing the employer had the work available, they may put them on. Possession of a driver's licence was seen as important to some employers.

The benefit of pre-vocational training was mentioned. It meant to the employer that the applicant had an understanding of the requirements of the trade, and therefore some commitment.

The employer benefits of direct employment included a sense of control over who they employ. Some have a certain distrust of GTCs, perceiving them as 'just another government body' and also consider that by hiring through a GTC they are less likely to develop company loyalty and culture. Discussions with GTCs suggested that this was not a realistic fear, as an apprentice could be engaged by an employer continuously for the full term of the apprenticeship, with the potential of 'becoming' a committed employee. One employer was concerned that as a GTC employee, an apprentice 'would have someone to complain to'. One GTC believed that the drop-out rate is high amongst those apprentices appointed directly by an employer. However, this did not seem to be backed up by the employers who employed direct.

Through a Group Training Company: All three GTCs interviewed had profiling systems for new applicants. Entrance tests were considered an effective measure an applicant's suitability to the industry and ability to pass the training. A NECA GTC apprentice was considered to be well screened prior to employment by those in the industry who hired them. This GTC reported that it actively encouraged those who hadn't passed the entrance test either to try harder at school and re-apply, or to consider another industry which may not require such a high standard in maths.

In the Sydney region the NECA GTC appreared to be highly regarded and well-used by the industry. Hiring an apprentice through this company was considered to be cheaper than directly employing an apprentice. In Brisbane the reverse situation seemed to apply with employers considering a GTC to be more expensive than hiring direct (the Brisbane GTCs interviewed were not NECA companies). As mentioned earlier, the GTC in Sydney had no trouble placing apprentices and in fact had a number of employers waiting for an apprentice, while those interviewed in Brisbane actively canvassed for host employers.

Some employers treated the GTC as an employment agency to obtain short term labour. This may be a disadvantage to the apprentice in terms of training. One GTC had to implement a policy requiring a minimum hiring period. In Brisbane one GTC had difficulties placing first year and fourth year apprentices due to lack of experience and relative cost respectively. It was cheaper for an employer to hire a tradesman on an hourly basis than a fourth year apprentice requiring supervision.

In summary, the reasons in favour of using a GTC included not only cost (in NSW), but also:

- general ease, no hassles – all screening and initial and ongoing administrative work is handled by the GTC
- the potential to hire an apprentice with appropriate skills for the time required, without a long term commitment
- flexibility to release an apprentice if they were only required for short term work or in the case of industry fluctuations or if they didn't work out
- release from the need to have guaranteed future work
- the potential for broader skills to be acquired by the apprentice across a range of industries
- ability to ensure that personality clashes in the workplace were easily handled by swapping an apprentice back into the GTC system.

Employers who were recent trainers

In contrast to traditional employers, recent employers are those who have not previously employed an apprentice but have taken one on in the last twelve months. Interviews with these employers revealed that their reasons for employing an apprentice were roughly parallel to those of traditional employers, although with less focus on the company loyalty and continuity aspects.

Since hiring an apprentice their concerns were that it has now changed their potential to work flexibility, increased their need for guaranteed work, and created the responsibility to provide the apprentice with on the job training. Use of a GTC reduced these concerns because of the fallback position of returning the apprentice during difficult times. A rural employer may not have this opportunity, however.

Employers who were non trainers

Employers who have never employed an apprentice were also interviewed, as well as those who have no first year apprentices now but still have older apprentices, and those who used to have an apprentice but don't now have one.

Those who have never employed an apprentice operated this way for a range of reasons. Essentially, these reasons were found to be the inverse of all the reasons why others did employ an apprentice, as outlined above.

Cost: Employers who have never employed an apprentice consider that the cost to them of time in training and supervising an apprentice on the job was prohibitive. They believe that they can't 'make money' on an apprentice for several years, if at all, and that by contrast, hiring a qualified tradesman costs less on an hourly basis. They want someone who can do the job without supervision and who has the skills required.

Labour: In some instances the type of work undertaken by the contractor was unsuitable for an apprentice, eg interstate or overseas locations, or major projects requiring skilled labour. It was 'less hassle' to not engage an apprentice, and if the contractor wished to remain a small organisation, then the absence of an apprentice helped to achieve this end.

Adding an apprentice increased the complexity of business operations and placed a responsibility on the employer to ensure that meaningful work was available. It also required long-term commitment, something which might not be possible during times of economic uncertainty.

Employers with no first year apprentices, but who still have older apprentices, had chosen not to recruit this year mainly because of their current and projected workload. One employer still had apprentices in Years 2, 3 and 4, and if they needed first year apprentices in order to fulfil future work commitments, they would hire them from a group training company.

Employers who no longer employed apprentices were in this position either because they outsourced much of their work, and hence the staffing of projects was the responsibility of others, or because they were gradually scaling down their operations prior to retirement in the not too distant future. They regretted that they were not now contributing to the industry by training newcomers, but had to consider their own circumstances first.

Negative views held by some of this group of employers towards apprentices included such attitudes as 'the kids of today don't want to work or to learn anything' and 'those who have done pre-vocational training think they know everything'. Some employers felt that younger recruits would be more suitable - requiring an apprentice to have year 12 was a drawback, as by this age young people had developed a disproportionate sense of their 'rights', and not an appropriate work ethic. Others considered Year 12 to be essential, as without it they would find TAFE too hard.

The need to supervise an apprentice, especially one in first year, was seen as a particular drawback, but necessary not only because of apprenticeship conditions, but also because of the strong need for safety. Some said that if they decided to recruit an apprentice in the future, they would engage at least a second year one, definitely not a first year.

Non-completion of apprenticeships

Non completion of apprenticeships did not seems to be a major issue according to most employers interviewed or the GTCs. However, one employer was of the view that the industry tended to lose apprentices in the middle years and that it needs to find a way of

retaining these apprentices rather than letting them move into sometimes unrelated positions in other industries. Many years of valuable training by an employer were effectively lost to the industry.

Another employer considered that Years 2 and 3 tended to be the critical years, when apprentices may be off-loaded because their increasing wages were becoming a burden within the overall cost structure of a company. In addition, when the fact that the work could be hard and dirty became a strong deterrent, and when their TAFE course became more difficult, apprentices may leave the industry. In the situation where these year groups may not be particularly sought after by employers because of cost, continuity of experience and training could be jeopardised.

Attrition of tradespersons

It was not possible to ascertain whether there was a view overall that tradesmen were leaving the industry in any great numbers. Comment was made that many moved from actual trades work to other areas within the industry (such as retail).

New Apprenticeship Centres

It was difficult to determine whether employers had dealt with NACs as they were not always readily recognisable in this form. There were mixed comments on those that did recognise NACs, with some commenting that they had been helpful in filling out forms while others claimed that they had been provided with mis-information from a NAC.

Topic guide for interviews with employers in the electrotechnology industry

Aims

To determine why employers:

- employ Apprentice initially
- employ additional Apprentice
- keep apprentices on for the duration of their training
- let Apprentices go before the end of their training
- stop employing any Apprentices after the initially employing at least one
- do not employ apprentices at all
- might be encouraged to employ an apprentice or additional apprentices

Introduction

Brief description of NCVER and the research project

Company history and demographics

General company profile

Length of time the business has been established

Current standing of the business i.e. are they expanding (experiencing recruitment difficulties), contracting, stable, undergoing restructure

Sector they work in and the type of work undertaken

How they get their work – i.e. through long term or short term contracts, multiple contracts, government or non-government etc

Do you have a recruitment policy, if yes what is it

Do you have a training policy , if yes what is it?

Employment profile

Company size

- number of Apprentices
- trades people
- non-trade workers

What type of skills training do they have

Type of employment (part-time, full-time, casual)

Do you employ any females? Why not?

'Traditional' trainer

How long have they been employing Apprentices

Are they reducing, increasing apprentice numbers, or are they stable

Why do they employ Apprentices?

What are the main benefits and negatives of employing Apprentices

Are they considering not employing Apprentices in the future?

'Recent' trainers

What made you employ an apprentice?

What if any was the deciding or most important factor

Have you employed apprentices in the past?

Do you employ other unskilled or unqualified workers in the past?

If yes why didn't you continue to employ unskilled or unqualified workers as in the past

Recruitment of Apprentices/Trainees (for both 'Traditional' and 'recent' trainers)

How do they recruit?

What is the quality of applicants like

What do they look for in a recruit

What are the important skills (i.e. technical, attitudinal, communication)

Do they or have they had trouble recruiting

Why dont they employ unskilled or unqualified workers instead

Direct employment i.e. not from a GTC (for both 'Traditional' and 'recent' trainers)

Why do you directly employ Apprentices instead of going through a group training company

What are the benefits of directly employing Apprentices?

What are the main benefits?

What are the negatives

If they use both probe reasons why

Use of Group training Companies (for both 'Traditional' and 'recent' trainers)

Are they habitual/constant users

What type of Apprentice do they take

How long do they usually employ them for

What governs the length of the contract

Why do they use GTC's instead of direct employment

What are the benefits (main benefits) of using a GTC

What are the negatives of using a GTC

Have you ever directly employed an ex GTC Apprentice?

'Non-trainers'

Why don't they employ Apprentices?

What are the main reasons and how strong are they

Is it possible these reasons will change in the immediate future, can they be overcome in anyway or at least minimised

Have they **ever** employed an apprentice?

If yes why don't they know, are there previous positive or negative experiences

If no, why not, do they have any experience of any kind with Apprentices, what perceptions if any do they have of apprentice –how do they form these perceptions

Have you ever heard of GTCs

Have they ever thought of using a apprentice from a GTC

Why do they or don't they

Reasons for non-completion of Apprentices (all employers)

Have they ever know first hand of Apprentices not completing their training

Why do they think they leave

What are the main or strongest reasons

Can these perception be turned around, how

Why skilled trades people leave the industry (all employers)

Have they thought of leaving?

If yes -Why, what are the main reasons,

How strong are the reasons

Can these perception be turned around

Possible Policy levers (all employers)

Probe employers on the following issues:

Improving commitment from employers to invest in training

What are the benefits of employing a Apprentice

How can these be best articulated to other employers

How do we get more Trades people into the system

How would you change the current system of training apprentices

What do they think of the following?

- Completing say a years study (TAFE) starting the in the job training
- VET in schools ie doing the first part of the trade course while still at school
- Mature age workers, including other (non Electro) trade workers
- Are they aware of any of the above exist

New Apprenticeship Centers

Have you heard on New Apprenticeship Centers, if yes how did you hear about them?

Have you used them

Did you know they provide support to employers and apprentices

Have you seen the advertisements

Red tape/Bureaucracy/paper work/administration

How big a turn off is the associated paper work

Did you have any idea what you were getting into (for recent employers)

Are you able to keep up with the changes that have occurred over the years?

Do you have problems employing trades people from interstate?

Demand for new skill sets

What are the new skills sets

How are these skills sets transferred to new and existing employees.

Appendix 3

Statistical analysis of the Survey data

Introduction

In an attempt to gain a better understanding of the characteristics of trainers and non trainers the data was examined using three techniques.

Firstly, the data was analysed using the AnswerTree package, which has a variety of data segmentation methods available. A second approach was to fit various linear and log-linear models to the data in order to identify the variables that were the most important influences in the decision to train or not train. The third approach taken was to undertake factor analyses on the questions regarding attitudes to apprentices and the apprenticeship system (B18 for trainers and C11 for non trainers).

Caveats

It should be stated from the outset that there were some problems encountered when analysing the data.

The most notable was the number of multiple response questions asked. There is a potential for making false inferences from the data owing to the fact that the analyses will give equal importance to each response even though there is no way of knowing if that is what the respondent intended.

For example suppose two respondents, A and B say, both respond "Residential" and "Commercial" to question A1 (Sector). There is no way of knowing whether the involvement of A in these two industries is the same as the involvement of B. An extreme case would be if respondent A was almost entirely involved in "Residential", only marginally involved in "Commercial" and respondent B was the opposite. When analysing by sector, both these respondents will be treated the same in both sectors despite the fact that each of them has little involvement in the sector that the other has a major involvement.

If the proportion of respondents who give multiple responses to a question is low then there is little cause for concern. However, only 21.8% of respondents gave just a single response to question A1 (Sector). Those who gave multiple responses form a clear majority of the respondents as shown in table 1.

Table 1. Number of responses to question A1 : Sector

Number of responses	1	2	3	4	5	Total
Frequency	196	244	251	207	3	901
Percent	21.8	27.1	27.9	23.0	0.3	100.0

Similar comments apply for the other multiple response questions. There is no way to distinguish which response is very important to the respondent and which is not.

Another problem was the sample size obtained. The 901 completed interviews is sufficient for examining frequencies and simple cross-tabulations but once the sample is categorised by several variables, the amount of sample in any given category can get too small for reliable analysis.

Results of the analyses.

The results of the multivariate analyses revealed nothing over and above that which was revealed by examining the frequencies and simple cross-tabulations.

Data Segmentation

The group of methods that comprise this type of methodology do not rely on the assumptions that are the foundation of classical methods. This makes them excellent tools for exploring data regardless of the type of variables involved. Any results obtained are generated from the data rather than being an artefact of any assumptions that have to be made in order to analyse the data.

The data segmentation methods applied using AnswerTree were particularly affected by the relatively small sample size. In particular there were problems in keeping enough observations at each stage of the analysis to get reliable results. Even after reducing the sample size required in order for the data segmentation to proceed to another cycle, the process still had problems with small subgroups of respondents (for example respondents employing larger numbers of workers).

Linear/Log-linear modelling

Various linear and log-linear models were fitted to the data in an attempt to discover which variables tended to be associated with being a trainer and which were associated with being a non trainer. The results of fitting the models were discouraging. Some of the models retained so many terms that there was a concern that the model was actually fitting "noise" rather than "signal". Generally, testing the validity of the models (eg residual analysis and sensitivity analysis) tended to lead to a conclusion that the models were unreliable.

Factor Analyses

The factor analyses were also disappointing. Although it did deliver something in the way of an identifiable result, there was certainly nothing revealed beyond the analysis of tabulated data.

All respondents were asked fourteen questions relating to apprentices and the apprenticeship system to which they were asked to agree/disagree. Factor analyses were conducted on these questions to examine any underlying structure in the data. The factor analysis was done separately for trainers and non trainers. The analysis was then repeated by splitting trainers into recent and traditional and by splitting non trainers into those who had never trained and those who had been trainers in the past. The analysis was conducted again after further splitting the existing groups based on the number of employees at the respondent's establishment. Once the factor analyses were conducted at this level, numerical problems were encountered (ie sample sizes were now to small), making it impractical to examine the data at any finer level.

The most notable aspect of the factor analyses is that regardless of the way the data was split into subsets, the procedure tended to identify about six factors, each accounting for roughly the same amount of variance. There was more variability for the finer classifications, but the general trend was still evident, although the factors tended to be difficult to interpret and inconsistent across the different levels of disaggregation of the data, there was however, one factor that did consistently appear in the analysis.

The factor that was most noticeable related to the "stock of skills in the industry". This factor appeared regularly for trainers and non trainers and persisted across the various levels of disaggregation. It appears that both trainers and non trainers have a common concern with respect to the items

"training apprentices is a good way to bring new skills into the industry"

and

"need more apprentices to replace tradesmen who are leaving the industry".

Table 2 shows the factor loadings that the two items had on this factor. As can be seen, the factor loadings are quite high (any loading greater than 0.6 can be considered 'high') for trainers whether recent or not and non trainers whether past trainers or not.

Table 2. Factor loadings on "stock of skills" factor.

	Trainers			Non trainers		
	Traditional	Recent	All	Never trained	Trained in past	All
New skills	0.63	0.73	0.73	0.71	0.73	0.76
Replace tradesmen	0.77	0.78	0.76	0.79	0.78	0.75

Furthermore, this opinion tends to be held regardless of the number of employees the company had. Whilst this factor is a clear output from the factor analyses, it does not add anything more than that which was revealed by examining the tabulated results.

Of the other factors that may be identified, there was a tendency for trainers to view the apprenticeship system as being flexible and the level of government support as adequate. However this factor tended to be confounded when the data was analysed by type of trainer and number of employees because other variables also loaded onto this factor. Other factors tended to change with the level of the analysis and also were difficult to interpret.

The results of the factor analyses are not unexpected when one looks at the correlations between the questions asked of the respondents. The correlations tend to be low with many of them near zero. This situation is not conducive to finding an underlying factor structure to the questions.

Conclusion.

The multivariate procedures used to analyse the data set have not produced any more understanding of the data above that which was gained by looking at tabulated data. The best result was from the factor analyses and they merely tended to confirm results already identified by examining tabulated data. The analysis done on this data set should be considered exploratory, given the caveats mentioned previously.

Appendix 4

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TRAINING AND YOUTH AFFAIRS**
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Request for provision of quotation

A consultancy to undertake research into

employer engagement with New Apprenticeships

in the electrotechnology industry

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Statement of requirement

1. Overview

In late in 1999, the Minister for Education, Training and Youth Affairs, Dr David Kemp, met with the heads of the Australian Chamber of Commerce and Industry (ACCI), the Australian Industry Group (AIG) and the Business Council of Australia (BCA) and instituted an industry led process designed to establish the steps that industry, government and the partnership of the two could take to redress industry skill shortages.

Three industries were investigated initially – engineering, automotive and electrotechnology – and reports from the working groups from each, were delivered to Dr Kemp at an Industry Skills Forum in Melbourne on 28 April 2000.

At that Forum, Dr Kemp announced three further industries – building and construction, food trades and rural industries – to be reviewed similarly over the next year.

He also announced the Government's intention to implement action plans based on report recommendations, aimed at minimising skill shortages within the engineering, automotive and electrotechnology industries. Action plans were signed by representatives of the three industries in July and August 2000.

The National Electrical and Communication Association (NECA) has identified an issue, which in their view, was not adequately addressed in the Electrotechnology Action Plan. The issue is employer engagement. NECA contend that if employers are not offering enough New Apprenticeships placement opportunities to meet the demand for skilled labour, there is the potential for a large gap in the national skills shortage strategy. Discussions have taken place between the Department of Education, Training and Youth Affairs (DETYA), NECA and ACCI, regarding the issue of employer engagement and the need to commission the National Centre for Vocational Education Research (NCVER) to undertake a research project into the issue.

2. DETYA's requirement

2.1 Project outcomes

The primary purpose of the Employer Engagement with New Apprenticeships Project is to identify and analyse the triggers for employers to create New Apprenticeships training places. Specifically what are the reasons employers:

- make the decision to employ a New Apprentice
- keep employing a New Apprentice
- employ additional New Apprentices.

By identifying the reasons and processes by which employers make decisions on employing New Apprentices, the potential levers to positively changing employer behaviour will have been identified.

The Employer Engagement Survey will focus on the Electrotechnology industry. In developing the survey instrument consideration must be given to adapting the survey methodology to other industries in the future, if required.

Issues to be addressed by NCVER should include, but not be limited to:

- historical profile of the electrotechnology industry, including
  - sectors comprising the industry
  - size of labour force, overall and by sector
  - share of apprentices and trainees, overall and by sector
  - demographic profile of apprentices and trainees, including AQF, full-time/part-time status, age, gender and educational attainment
  - number of employers and type (small, medium, large)
- the differences in take up of apprenticeships and traineeships across the electrotechnology industry sectors
- the drivers of the decision to take on an apprentice or trainee, from the point of view of:
  - employers who traditionally train
  - employers who have only recently decided to take on an apprentice or trainee for the first time
  - employers who do not train – reasons why.

2.2 Methodology

The two most important aspects of this research project are to identify:

- current level of demand for apprentices/trainees in the industry and the potential for expansion in the number of available apprenticeship /traineeship places
- reasons why employers choose, or choose not, to train and the associated policy levers to influence employer behaviour.

To achieve these ends, the methodology should comprise a combination of quantitative and qualitative research methods. NCVER is invited to submit a methodology for this project, consistent with the available budget and comprising, at a minimum:

- **Literature Review** – brief analysis of recent Australian and international research (last 5-10 years) on the drivers of demand for apprentices / trainees and, in particular, the drivers of growth in training numbers
- **Desk research** – analysis of current and historical level of demand for apprentices and trainees in the Australian Electrotechnology industry and sectors, including analysis of potential for growth in training numbers
- **Semi-structured interviews** with three groups of employers (traditional trainers, recent trainers, non-trainers) to identify drivers of the decision to train and possible policy levers
  - non-training employers should be asked what could be done to change their decision not to take on apprentices or trainees

- **Quantitative survey** of employers to establish the relative significance of the drivers identified through the semi-structured interviews
    - non-training employers should be asked about how they would respond to the policy levers identified
    - training employers should be asked to identify their reason for training, based on reasons given in semi-structured interviews
    - NCVER will be required to construct a sampling frame
- **Multivariate analysis** of survey data exploring the determinants of the decision to train. Variables should include, at a minimum,
    - employer size (small, medium large)
    - industry sector
    - a measure of product demand, activity level or profitability
    - previous employment of apprentices/trainees by employer (yes/no)

The multivariate analysis must be written up in plain English.

2.3 Project Deliverables

- *Detailed methodology* comprising:
    - rationale for literature review
    - data sources, variables and time period to be explored in desk research
    - interview guide and schedule for semi-structured interviews, including methodology for selecting employers to be interviewed
    - design of quantitative survey instrument, including approval through ABS clearing house if required
    - proposed method to analyse survey data and method to estimate potential for growth in training numbers

- *Literature Review report*, including executive summary and bibliography

- *Semi-structured interview transcripts* and a *report* summarising the main findings for the three employer groups

- *Survey instrument* and tabulated *results in flat file format*

- *Final Report* on survey findings, including
    - results of multivariate analysis
    - summary of literature review
    - issues arising from semi-structured interviews
    - potential for growth in employer engagement in training
    - policy levers to achieve growth and estimate of impact on growth

2.4 Project costings

The value of the contract will be a maximum of $50,000. The exact amount will be negotiated following the finalisation of the survey methodology in consultation with NCVER and NECA.

2.5 Project management

The Employer Engagement Survey will be managed by the Industry Skills Section of DETYA in consultation with NECA.

Together with the responsibilities outlined in this request for quotation, NCVER will be responsible for gaining ABS clearance to conduct research involving collecting data from employers.

2.6 Project deliverables

Payment of project funding instalments will not be made until the provision of the consultancy services for specific funding milestones have been met to the satisfaction of DETYA and DETYA has formally accepted that the requirements of the consultancy services have been met.

Due: 5 February 2001

Present progress report on the analysis of the literature review.
Present progress report on the statistical analysis and review of existing data.
Oral report on progress of face to face consultations.
Oral report on progress of telephone consultations.

Due: 14 February 2001

Provide draft final report

Due: 28 February 2001

Provide final report on Employer Engagement with New Apprenticeships in the Electrotechnology industry. This report will include all the data collected, an analysis of the findings and recommendations for possible future research. It will also include a detailed explanation of the evaluation methodology as an appendix to the report.

All intellectual property arising from the conduct of this project will be vested in the Commonwealth.

2.7 Management process

All aspects of the Employer Engagement Survey, including frameworks and processes to undertake the project will be negotiated with DETYA and will subject to approval by the Department. All proposed final materials for the survey must be approved by the DETYA following consultation with NECA.

DETYA's involvement with NCVER will be directed through a nominated project manager. The project will be managed by the Industry Skills Section, Industry Training Branch, Training and Youth Division of DETYA.