The series 'research at a glance' is produced by the National Centre for Vocational Education Research (NCVER) to disseminate, in an easily accessible format, the findings and outcomes of research in vocational education and training (VET). It identifies the policy implications of the research and how those findings might be applied in the VET sector. It is hoped it will be an aid to both policy-makers and practitioners, providing information to improve the VET sector.

## returns on investment in training

A new body of research has just been completed on the *returns on investment* (ROI) in training in Australia. Prior to this research effort, little empirical research had been undertaken on the returns to training in Australia, and it was unclear if international evidence on ROI in training could be applied to Australian firms. This research at a glance synthesises the findings of the recent Australian research.

## summary of key issues emerging from the research

Until recently, the evidence for returns to investments in training by Australian firms was poor. This is because many firms do not carry out systematic evaluations of their training and even fewer attempt to calculate the returns to their investments. However, the recent Australian research changes this situation. The results from this work provide a solid body of evidence that across a range of sectors training investments can yield very high levels of returns for firms. The research has highlighted a number of important factors about returns to training.

- Returns to training investments are nearly always positive and can be very high.

  Many of the researchers examined case studies of individual firms and found that returns on particular training programs can be very high. The rates of return depend neither on firm size nor the industry in which the firm is located but on the nature of the training program and its relevance to the business needs of the firm.

# research at a glance

# returns on investment in training

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- Returns can come in many forms.

  The returns to training investments are not always in the form of increases in labour productivity or profitability which have been the usual variables that researchers in this area have been concerned to measure. Returns may come in the form of higher levels of value-added activities as a result of greater levels of employee skills, increased flexibility amongst employees who can perform a range of tasks, reduced overhead costs to the firm (such as more efficient use of existing facilities) and greater ability to innovate in terms of adopting new technology and introducing better forms of work organisation. This means that firms need to be aware of the range of ways in which returns to training investments might be realised and develop means of measuring these.

- The immediate returns to training are highest when the training is highly focussed.

  Training needs to be focussed on a clearly identified business problem. The more focussed the training on the actual needs of the business, the higher the returns that the firm will experience from its investments in training. Training also yields higher returns when it is linked to innovation, particularly technological change.

- Measuring returns is not always an easy task.

  Although much of the data needed to analyse returns are available within firms, there are a number of methodological traps for the unwary that need to be taken into account when doing this work. Returns are also easier to calculate in some industries than in others; studies of service industries with their intangible products can pose particular problems.

- Training acts as a support mechanism for other changes in firms.

  The research shows that training does not act alone to improve the performance of firms. The importance of training lies in the fact that it allows firms to introduce change more successfully. Thus firms experience considerable productivity benefits from the introduction of new technologies. But they may not realise those benefits fully unless employees have been properly trained to operate and maintain the new equipment. Similarly with other forms of innovation. Training pays its highest dividend to firms when it is linked to 'bundles' of other innovative practices such as new ways of working and new forms of organisational structure.

- Returns to training can be enhanced by other human resource policies in the firm.

  Human resource practices that encourage staff to remain with the firm after training can enhance returns to training. Typical practices include promoting staff from within rather than external recruitment and the development of broad skills sets amongst employees such as leadership, team-building and other generic skills.

# introduction to returns on investment in training

## what is meant by investment in training?

Training represents an investment by firms in their employees. Like other investments undertaken by firms, a cost is incurred in anticipation of a future return to the firm. The future return takes the form of improved productivity, improved workplace performance or improved profitability.

## why measure returns on investment in training?

It is important for firms to have accurate measures of ROI in training for this is what determines the level of training that will be conducted. A firm will want to compare the return from investment in training with returns from other forms of investment, and then undertake investments with the best overall rate of return. Under-provision of training may result from a lack of understanding of the benefits of training by firms (Bartel 2000). It is important for governments to understand the returns to training, as they may wish to allocate government resources to subsidise private investment in situations where there is under-provision of training because of market failure. A firm may not be able to fully capture the benefits of training in situations where employees work seasonally or casually for a number of employers. Allocation of government resources to subsidise private training is problematic, as employers and employees may share in the costs and benefits of training. Governments facing an ageing population may wish to invest in adult retraining as well as entry-level education and training in order to improve economic performance.

It is important for firms to measure and benchmark their gains from training against the benefits obtained by other firms.

## training evaluation

Not all training will result in a net benefit. However, there are circumstances where training can be beneficial even if the training has not delivered a net financial return. The training may have produced non-pecuniary benefits. These could include the achievement of a quality assurance rating that will allow a firm to expand into new markets or a safer workplace that will lead to a reduction in staff turnover because of greater job satisfaction.

Dockery (2001) recommends that the focus of research into the benefits and impacts of training should be to look at training as a purpose-specific input rather than a general input and then evaluate the impact of training against the relevant objectives rather than against general performance measures.

A high return from a training program does not imply that the training was fully effective. Doucouliagos and Sgro (2000) emphasise that there is a difference between returns from training and effectiveness of training. Although a positive net ROI may have been achieved from a training program, it may have been possible to achieve additional benefits. If an evaluation identifies a divergence between the actual ROI and the potential ROI, then the appropriate type and quality of training may not have been delivered. The firm itself has to set training targets and then determine if they were met. Most firms will have practical constraints on the possible coverage of training that will, by necessity, limit the returns from training. It may not be practicable for all the members of a production team to undergo training, particularly if workers have to be taken off-line to attend. Evaluation is essential, as it will identify if improvements can be made to the scope or delivery of training in the future.

Training is often linked to the introduction of new technology, work practices or business practices, so, in many cases, the benefits of training *per se* cannot be separated from the effects of these other changes.

## Australia-wide evidence

There is evidence that returns to vocational training of adult workers are relatively high. Long (2000), in an analysis of the 1997 Australian Bureau of Statistics (ABS) Survey of Education and Training, estimated that recipients of training, on average, earn about 10% more than non-recipients of training. Structured training had a positive effect on earnings, but the effect of various forms of unstructured training was mixed.

### inequities in training

Although there are fewer differences in the distribution of training amongst groups of Australian workers than occurs in other Organization for Economic Co-operation and Development (OECD) countries, not all groups of workers receive the same amount of training. The better educated and those who are already advantaged in the labour market receive relatively more employer-sponsored training than other groups, presumably because firms receive a higher return by training these people. Workers with low levels of initial training, who were migrants, in low-paid, low status, casual or part-time jobs tend to receive less training than other workers. As firm-sponsored training is rationed, some form of government intervention to improve the accessibility of training for all groups in the labour market is warranted.

### impact of previous training

Blandy et al. (2000) found a highly significant positive correlation between educational attainment and the provision of employer-sponsored training in an analysis of the 1997 ABS Survey of Education and Training experience. The probability of participating in any training increases with the educational attainment of an employee. When employees who did not complete secondary school were compared with other employees, it was estimated that:

- tertiary-educated employees were 39% more likely to participate in training
- employees with post-secondary school qualifications were 17% more likely to participate in training
- those who completed secondary school were 15% more likely to participate in training

However, for those who do receive employer-sponsored training there is a significant negative correlation between educational attainment and hours of training received. This implies that an employee selected for training with a relatively low level of educational attainment will receive more hours of training than an employee with a higher level of educational attainment. In simple terms, they participate in fewer training activities but have more hours of training for those in which they do participate.

### training and productivity

Blandy et al. (2000) undertook a pilot survey of 40 firms to investigate the association between on-the-job training and starting wages, wage growth, and productivity growth. The study probed the search activity undertaken by employers before appointing new recruits and the on-the-job training that was provided on commencement. The study replicated a larger United States employer study and made comparisons between Australia and the United States. Blandy showed that an increase in training activity is associated with higher productivity.

Nearly all the productivity gains from incoming employees' training are captured by firms in Australia compared to about half in the United States. Australian employers are able to pass on the costs of training to employees through lower starting wages that are not recouped through future wage growth. In addition, Australian firms screen employees more thoroughly than United States firms. The results of this study suggest that Australian firms provide more training to incoming employees than United States firms.

## factors associated with more training

The pilot survey conducted by Blandy et al. (2000) did not identify a relationship between training quantity and training quality. However, a positive association was established between firms' profitability and the quantity and quality of training offered. Generally, more profitable firms pay above-market wages and operate in labour markets where it is hard to recruit and retain labour. A higher number of training hours was linked with more uncertainty in the product market and higher levels of other forms of capital investment. Typically, lower hours of training were associated with higher rates of staff turnover.

## evidence from ABS Business Longitudinal Survey

The Business Longitudinal Survey (BLS) is a large national sample of firm-level information on training practices and business practices. Unfortunately, because training cost data were not collected, the survey provides little information on the rate of return from investment in training. In addition, diverse production processes cannot be properly modelled, and there is the potential for bias arising from some methodologies used to model the training decision.

Nonetheless, the advantage of the longitudinal database is that changes in productivity are controlled for by the differences between firms. Dockery (2001) analysed the four waves of the survey and identified that different types of training such as technical, on-the-job, structured and managerial training are complements rather than substitutes and tend to be implemented across a business simultaneously. Training is used to facilitate the implementation of new technology, new work practices and business strategies. Firms that have high levels of formal or strategic planning tend to be innovators and have high levels of training. Only limited associations between past and future business changes and training were found in the analysis of the BLS. This evidence suggests that training accompanies, but does not induce, innovation. The analysis of the BLS provides evidence that larger firms and firms operating under awards and formal enterprise agreements are more frequent training innovators. Other financial characteristics such as profits per employee, capital to labour ratios, wages, and export intensity were not associated with increases in training activity.

# measuring returns on investment in training

## the 'ideal' case study

A pre- and post-test control group are identified—employees are assigned to either a training group or a control group, which may subsequently receive training. The performance of the two groups is compared to identify outcomes from the training program.

## evaluation methodologies

**productivity studies**

The goal of increasing productivity may be a reason to implement training programs. Typically, it is not possible to disentangle the effects of training *per se*, as changes in productivity could reflect both the results of training programs and the introduction of new work practices or new technology.

**cost–benefit analyses**

There is an inherent complexity involved in quantifying the returns to training. Many studies rely on both qualitative and quantitative measures to make a subjective assessment about the effectiveness of training. Such assessments may incorporate different levels of direct and indirect outcome measures, such as participant satisfaction, evidence of knowledge being acquired, participant application of skills back on the job, and discernible improvements in terms of reduced costs or improved quality. It is important to take account of non-pecuniary benefits in these evaluations.

## evaluation procedure

Doucouliagos and Sgro (2000) propose an evaluation and analysis procedure for firms to analyse and evaluate the returns to training:

- data collection—to measure performance, to measure training, identify costs and benefits of training
- pre- and post-training analysis—direction and magnitude of change, statistical significance, economic significance
- multivariate statistical analysis—identify if training or other factors had a significant impact
- calculate return on investment—cost–benefit ratio and return on investment
- strategic evaluation—identify if the firm's strategic objectives have been achieved

## other ways to evaluate the returns from training

Most companies measure the impact of training by considering their workers' reaction to the training, workers' learning from the training and the impact of training on workers' behaviour. Only a few firms evaluate the economic return to the company (Bartel 2000).

Potential benefits from training include improved occupational health and safety outcomes, greater motivation, lower staff turnover, lower wastage, a more flexible workforce, higher productivity or improved quality of products. In addition, training may instil in the workforce a commitment to corporate goals and lead to an improvement in overall staff morale and problem-solving ability. It

can also assist a firm to achieve other non-economic benefits such as a self-sufficient workforce, with increased confidence and better communication skills, that will take on a higher level of responsibility (Dockery 2001).

### difficulties with evaluating benefits

Typically, these methodologies are better suited to evaluating returns to training undertaken by manufacturing and production plants, as outcomes are more transparent. Studies dealing with service industries have proved more problematic (Blandy et al. 2000, and Maglen, Hopkins & Burke 2001).

There is an inherent modelling problem in many point-in-time analyses. Many studies have identified benefits, but once the studies have been revisited to take account of the modelling problems, the benefits have not been so apparent. Most firms don't evaluate returns because of the perceived difficulties in quantifying training benefits, separating the effect of training from other factors that also improve performance and problems with gathering the data necessary to make an evaluation (Bartel 2000).

### returns from training may accrue in the long term

Returns from training may not appear immediately or in the short term but occur over a considerable period of time. In such situations, analysis of benefits requires longitudinal data.

### traps for new players—methodological flaws

Often firm-level studies report inflated gains because of methodological flaws (Bartel 2000). Typically, studies that use wages as a proxy for productivity produce these results. Bartel (2000) provides examples of common errors of analysis:

- using supervisors' subjective evaluations of trainees' performance levels
- using self-reports from the trainees about the productivity gains
- monitoring gains for only a short time after the completion of a training program—productivity gains may diminish after about one month
- extrapolating findings based on a small sample to a larger group
- selecting the best employees for the training program
- letting the trainees know their post-training performance will be monitored
- ignoring the impact of operating in a new environment

## firm-level evidence

Bartel (2000) reports the findings from a number of international productivity-based studies. On the whole, firms that introduced training over a long period of time performed better than firms that did not. However, there were inherent problems with the evaluations, as they did not take the cost of training into account. Therefore, it is unclear whether the benefits from the training programs outweighed the costs.

### time series firm-level studies

Aggregated data on the costs and benefits of training are collected over a period of time, and recorded weekly, monthly, quarterly or annually. Data are typically sourced from human resource databases, accounting records or production records. This method allows the long-term costs and benefits of training to be identified as training costs may continue for some time, and the benefits of training may flow over time. This approach allows a distinct separation to be

made between outcomes pre- and post-training. The approach also incorporates outcomes achieved during the training.

Doucouliagos and Sgro (2000) used the time series approach to undertake case studies of Australian enterprises in both manufacturing industry and the service sector to investigate the outcomes achieved from firm-specific training investments.

**manufacturing industry**

The objective of the training program undertaken by a chemical company was to reduce lost time due to injuries through the introduction of safety training. Statistical analysis identified that safety training had a positive impact on safety performance by reducing the incidence of workplace injuries. In addition, the return on the training investment was positive, and the firm's strategic objective of reducing the number of medical treatment cases was achieved. In this instance, a high return to the investment in training was achieved because work-cover premiums paid by the company were reduced. The researchers also identified a link between the total expenditure on training undertaken by the firm and improved sales performance.

The approach was used to analyse the link between productivity and training for the manufacturer of photographic products. The evaluation, conducted over a two-year period, found that a training program to assist machine operators to understand and fix machine problems resulted in a statistically significant increase in productivity and a significant reduction in call-outs.

**service sector**

The methodology has also been successfully applied in the service sector. Doucouliagos and Sgro (2000) evaluated a training program in employment relations for a charity organisation. The training program was conducted in four regions, with the aim of retaining valued staff and reducing overall staff turnover. The evaluation compared staff turnover ratios pre- and post-training. The comparisons were conducted over a 6–9-month period, depending on the region. While there was a negative association between training and staff turnover in all four regions, the evaluation only found statistical evidence that the training program had improved efficiency and reduced costs for the company in two of the four regions that had conducted the training program. Overall, there was evidence that the training program provided a positive return to the charity association.

## matched plants studies: comparing outcomes of like firms operating in the same industry

This approach is based on a methodology developed by Prais, Jarvis and Wagner (1989) to examine productivity at German, French and British plants. The studies compare plants or enterprises producing comparable products or delivering services that are similar in terms of location, size or quality.

The initial European studies found increased levels of training and education to be related to greater productivity, improved workforce flexibility and potential improvements in product quality. The results suggest significant payback to firms with a training culture. However, these findings cannot be generalised because the firms studied were by nature individualistic and tended to be responding to specific institutional requirements and unique constraints (Dockery 2001).

Maglen, Hopkins and Burke (2001) used the matched plants approach to undertake case studies of Australian enterprises in both manufacturing industry and the service sector to investigate whether training investment influences labour productivity.

**manufacturing industry**

*footwear manufacture*

The firms represented in the study ranged from firms that manufactured well-presented, heavier quality footwear to firms that manufactured light-to-medium footwear. The study found that differences in training investment in the footwear sector contributed to differences in productivity. Training contributed to the drive for innovation and high product quality and routine maintenance practices of personnel. Benefits from training were enhanced when staff with a strong maths and science background

and literacy skills were involved in the training. The most effective training was semi-formalised, on-the-job, competency-based training supported by class-based learning.

*wire products manufacture*

The training activities and productivity of five enterprises manufacturing wire products and employing between 20 and 200 employees were examined. Productivity differences between firms were attributed to product differences and to differences in management–employee relationships. Although the trend was for enterprises to increase their training expenditure over the four years to 1998–99, productivity levels for each enterprise remained relatively stable. An increase in training investment was required to maintain the financial viability of the enterprise. Some firms recruited skilled workers or workers with an ability to learn rather than invest heavily in training. It is possible that such firms received higher productivity and a better return per training dollar spent than other firms who recruited less well prepared staff and then trained them.

**service sector**

Measuring the effect of training on productivity in the service sector is highly problematic. When measuring changes in productivity, allowances need to be made for improvements in the quality of goods. This is particularly difficult in the service sector. Shops that provide longer opening hours may provide a higher quality of service, but the increase in hours comes at the expense of lower labour productivity.

*hotels*

Maglen, Hopkins and Burke (2001) studied the provision of accommodation at eight hotels ranging from five-star to four-star rating and between 100 and 600 rooms. The study identified that training played an essential role in helping hotels reach the level of style and service that they desired. However, differences in room quality meant that it was difficult to compare the labour productivity of hotel housekeeping services. Room 'equivalents' to be serviced per unit of time reflect room differences and productivity is often governed by the targets that have been set by management rather than actual efficiency. The attempt to quantify the effect of training on labour productivity merely identified the target that had been set. However, there is evidence that training has delivered productivity increases for the front office staff of hotels. Many hotels that had introduced enterprise-provided off-the-job training for the front office staff had quantified the cost of providing training. Comparisons of labour productivity across hotels provided support for training investment leading to higher labour productivity.

Blandy et al. (2000) undertook a matched plant study of five Australian hotels to examine the effect of training practices for housekeeping and reception staff on hotel productivity. The researchers found poor commitment to training by managers and little regard to possible innovations in technology or work practices. There was little evidence of training practices or VET qualifications influencing productivity levels in the hotels examined. However, the hotels used in the study differed significantly in the standard of accommodation they offered and the type of customer they attracted. Some hotels specialised in tourist accommodation, while others were geared to the business traveller.

In contrast to the results from the recent Australian studies, international comparative studies by Prais, Jarvis and Wagner (1989) identified a link between formal VET qualifications and improvements in hotel productivity that they attributed to greater workforce flexibility and innovation. This research also identified productivity gains from scale of operation and lower measured productivity from higher quality hotels.

*supermarkets*

Maglen, Hopkins and Burke (2001) studied eight suburban-based medium-to-large supermarkets from two chains that operate in a number of States. There was diversity in the employment practices of the supermarkets with a range in the mix of full-time, part-time and casual staff. Both chains operated segmented labour markets and provided short store-specific training courses for operational staff. Nationally accredited courses were only provided for personnel viewed as prospective shop managers pursuing a career in the chain. Training for the management group was not costed against a store. The levels of training expenditure per person for non-management staff tended to be identical across stores or identical across States.

There was no relationship identified between training expenditure and labour productivity. Productivity targets were set beyond the store, and local economic factors dictated levels of performance. However, training was seen as essential to achieve specific store objectives and changes and the target level of productivity. Targets and staffing levels were based on expected customer demand, and store managers were unlikely to consistently exceed their targets.

## matched pairs studies: pre- and post-training

Matched pairs analysis compares the information on the same set of individuals pre- and post-training. The methodology can also be used to compare two groups with similar characteristics except that one group is trained and the other is not. The approach can be used to evaluate training provided through a simulated work environment, training that is aimed at behavioural change and management and leadership training. This methodology has been successfully applied in evaluating training programs conducted in the service sector.

This approach is particularly useful to assess the impact of a training program on 'soft skills' that are often important in service industries such as retail. The costs associated with the training program were identified. Data were collected on store managers' pre- and post-training behavioural styles and on sales performance and staff turnover in the stores they managed. The evaluation showed significant reductions occurred in less effective behavioural styles and improvements in constructive behaviours with significant reductions in staff turnover. The association of the training program with sales growth was harder to ascertain. Sales did not increase in all stores post-training. It is difficult to infer that sales growth, when it occurred, was due to the training program, as many factors that are outside the control of the store manager affect sales growth. However, a positive ROI in training was delivered by the post-training reduction in staff turnover.

In the absence of quantitative data, qualitative data on perceptions can provide indicative data on the success of a training program.

Participants in a leadership and management-training program commented that the program increased awareness about proper planning and time management that has improved their work and family life and achieved the organisation's objectives of reducing administrative costs. The training program was evaluated through a post-course evaluation of measurable objectives set in a pre-course evaluation directed by a mentor.

## returns to training

The main range of outcomes sought by enterprises that invest in training and learning has been identified by Figgis (2001) in an in-depth study of small- and medium-sized enterprises which valued training. The objectives sought by the firms from training were to improve internal communication; to achieve flexible staffing; to minimise production downtime; to reinforce enterprise values; to assist succession planning; to aid community development; to meet regulatory standards and to improve staff retention rates.

Moy and McDonald (2000) identified factors that enhance returns to training and factors that inhibit returns to training:

### factors that enhance returns to training

Economic benefits to firms are greatest when innovations in management practices were integrated with employee training and empowerment programs. Enterprise returns to training are greatest when training provision aligns with:

- technological change
- innovative human resource policies and practices such as profit sharing, team-based pay, performance pay and bonuses
- work organisation and work practices that empower employees to be decision-makers
- corporate objectives and operating requirements
- low employee turnover
- senior management commitment
- supervisory support and involvement

Benefits to training may be maximised by:

- ensuring that appropriate employees participate in training
- using a range of skill formation approaches such as individual development plans and provision of learner support through mentoring, coaching, training information systems and training resource centres
- integrating language and literacy training with other training
- providing a mix of general and specific training
- ensuring close and effective links between on- and off-the-job training and other skill developments
- providing training at a time and in a form that meets business and employee needs
- completion of train-the-trainer programs by supervisors
- ensuring employee access to recognition of prior learning programs
- ensuring training programs deliver a consistent message
- provision of support systems to facilitate training transfer

### factors that inhibit returns to training

Returns to training are inhibited in situations when there is:

- lack of employee incentive to apply learning on the job
- lack of appropriate work design and job experience opportunities to complement training
- training that is not up to date, relevant and appropriate
- lack of complementary training for middle and senior managers
- a weak training support and performance-monitoring capability within the enterprise resulting from a lack of supervisor involvement and lack of management commitment

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