CONFERENCE PAPER

Identifying and reporting the value-added from training in four New Zealand industries

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ABSTRACT

The ability to estimate and report the value add of industry vocational training interventions in New Zealand can make a significant contribution to both industry and to the training providers and institutions. Understanding the value of investment in training is important for industry to underpin their commitment to training and the development of their workforce to improve the productivity and performance of their business. For training providers and institutions, the understanding of what and how training adds value to industry is important to the development and delivery of industry training.

These studies, the first of their kind in New Zealand, describe a methodology and the results achieved for four discrete sectors important to the New Zealand economy.

This paper was originally given at the 18th International Farm Management Association Congress, *Thriving In A Global World – Innovation, Co-Operation And Leadership*, at Methven, Canterbury, New Zealand, 20 – 25 March 2011, and is reproduced by kind permission of the conference organisers.

KEYWORDS: Reporting Value Added (RVA); Industry Training Organisation (ITO); vocational training; productivity; skill; management systems

1. Background

In March 2005, the Agriculture Industry Training Organisation[2] began a research project to develop a model and quantify the benefits of vocational training in ways that would be valued by key stakeholders.

The final report (McLeish *et al* 2007) reported the findings of the two year research project:

- Agricultural vocational training provides both quantitative and qualitative value to trainees, their employers, the wider industry and the economy.
- The total value to the dairy farm business from training was $8,332[3] per trained employee. The total cost of training, including trainee salary cost while training, was $2,452/trainee. Therefore the net return from training spent was $2.40 per $1.00 spent.
- The total value to the sheep and beef cattle business from training was $17,400/trainee and the cost was $3,505 per trainee giving a net return of $3.96 per $1.00 spent on training.
- There were also less tangible but important benefits from training that were identified by farmer employers – more positive attitudes, better understanding of farming systems, better communication through common understanding and shared terminology and better transfer of knowledge and technology. Trained staff also stayed in the industry, if not the farm business, for longer. Employers want employees who "can do" rather than "know how to do".
- The value derived from training was largely dependent upon the employer.

Some work in another study indicated training improves trainee earning power and improves career advancement by seven years earlier than a non-trained worker would achieve.

The RVA project was informed by the high impact learning work of Professor Robert Brinkerhoff (Brinkerhoff, R.O. and Dressler 2003) of the University of Western Michigan. These two pieces of work have and are continuing to influence the way that the Agriculture ITO structures its qualifications and delivers training to its industries (Hardy 2008).

2. The project brief

The Industry Training Federation developed a brief to undertake a project with the following objectives in four primary sector industries, including the food services industry.

[1] Agriculture Services Ltd, New Zealand

[2] Industry Training Organisations (ITOs) are not-for-profit entities owned by industry as part of a New Zealand government/industry partnership. ITOs sit at the interface between industry and tertiary education. They are recognised under the Industry Training Act 1992.

[3] The currency used here is the New Zealand dollar. At mid-October 2011 this was equivalent to about £0.50, €0.58, and US$0.80

Objectives

- Test the applicability of the model used in agriculture for identifying and reporting value added from training in other industries.

Key Outcomes

- To enable Industry Training Organisations (ITOs) and wider tertiary groups, industries and firms to gain a greater understanding of how they can identify and report value add by industry training.
- To enable better targeted investments in education and training.
- To be able to design and select better education and training activities.
- To get improvements in follow-up and support for the implementation of skills gained from education and training activities.
- To improve the connection between skill, productivity, profits and pay.

3. Methodology

The Reporting Value Added (RVA) methodology has seven steps in the process:

Step 1: To identify what training will be measured
There are two dimensions:

(*a*) Identify the key activities, tasks, etc, where the employee can have the most significant impact upon the performance of the business.
(*b*) Identify the topics of the most frequently used Unit Standards[4] that are completed in the workplace. This determines where the training effort is going.
If (a) and (b) are markedly different, then a number of useful questions can be asked about why the difference.

Step 2: Identify the financial benefits of improving performance across the training selected for evaluation

(*a*) Describe the observable behaviour of employee for each key task at each level of performance: *Entry, Basic Competence, Average/Good Operator Level, Best Practice Operator*
(*b*) Describe the impact of each level of performance in terms of the business, eg quality and quantity of output, change in risk, change in level of supervision required, rework required, downgrade of product, etc.
(*c*) Calculate the impact in financial terms.

Step 3: Gather data on costs

- Government costs (paid to tertiary training provider)
- Contribution by industry body (if any)
- Employer paid cost – direct costs
- Opportunity cost
  - Trainee time
  - In-house trainer time
  - Coaching/mentoring time by supervisor until the trainee is able to work unsupervised

Step 4: Gather data from direct supervisors on how a trainee changes in performance after training. A rating scale can be used.
Step 5: Using data from Steps (2), (3) and (4), calculate financial model and benefit/cost ratio
Step 6: Collect non-financial and other information from employees/supervisors
Step 7: Collect data from employees who have experienced the training

Steps 6 and 7 provide a qualitative dimension to the study.

4. Results

4.1 Extractives Industry

(a) Employee Training at Quarry Operator Level

In terms of vocational training in quarries, managers identified four key areas where operator performance had a significant impact on quarry performance.

1. Understanding the quarrying process, the operation of the crusher and their impacts on aggregate quality.
2. Operating mobile plant and machinery effectively and efficiently.
3. Operating within company environmental policies and standard operating procedures to avoid a breach of environmental regulations and consents.
4. Operating within company's health and safety policies and standard operating procedure.

Benefit/Cost Ratios

Task 1: Understanding the quarrying process, the operation of the processing plant and the impact on aggregate quality.

Issues:

- The task is very complex, has huge impact on the quarrying profitability and takes several years to acquire the skill and requires considerable supervision.
- Takes two years to get to average competence and four years to get almost to best practice.

Table 1 indicates a range of benefit/cost ratios for training a competent processing plant operator.

Table 1: Benefit/cost Ratios for Training a Competent Processing Plant Operator

After 1 year	2:1
After year 4 (fully trained)	24:1

Task 2: Benefit/cost ratio for the training of a competent operator of movable plant in the quarry.

This task is less complex but still significant. It takes a year to get to an acceptable standard and two years to get to best practice (on the range of movable plant).

Table 2 indicates the range of benefit cost ratio of training movable plant operators.

[4] A unit standard describes the skills and knowledge needed to complete a unit of work and the standard of performance to be reached. All unit standards are registered on the National Qualifications Framework, assigned a level and a credit value, and may contribute to the award of a National Certificate or Diploma.

Table 2: Benefit/cost Ratio for Training Movable Plant Operators

After 1 year	6.6:1
After 2 years	10:1

There was insufficient data to confidently provide benefit/cost ratios for the value of training in health and safety or environmental management compliance.

Interviews with quarry managers identified a number of themes:

- A well-trained operator can make a huge difference to quarry performance in the order of 30–40% and initial training can lift productivity 10–20% with further gains with experience.
- It is difficult to separate the benefits of formal ITO facilitated training, informal non-ITO facilitated training and on-the-job training by peers. It all works together to create high performance.
- Training and assessment by itself is not enough to assure competence. Ongoing practice under good coaching/mentoring is required to meet a competence in terms of a commercial operation. It can take six months to two years from the training event.
- Compliance training has made a noticeable difference in behaviour to improve health and safety outcomes.
- Front-line supervision has a major impact on training outcomes and needs more support and training for this role.

(b) National Diploma in Extractive Industries (Management)

The Level 5 301 credit National Diploma is a large qualification that is strongly supported by some companies and not supported by others.

Determining a single value add financial indicator for the Diploma qualification was not achievable. It was evident from the survey work undertaken that significant value can be added by applying the learning provided within this qualification. However, this is very dependent on the scope available to the learner within their management role. It was not considered that aggregation of this data would provide meaningful information.

Sixty one recent graduates and current trainees were surveyed and 33 usable replies were received.

- All interviewees really valued the Diploma in making a difference in managing a quarry. The high value modules were around people, finances, health & safety (managing older staff and getting them to comply with good practice) and enabling trainee managers to better understand and meet their KPIs.
- Even the units with less value were worthwhile in providing background understanding but the interviewees suggested that they went into too much detail.
- Case studies reported 2–5% productivity gains per year while other individual cases reported annual savings of $200,000 per annum in one case, a one-off saving of $300,000 in another and a gain in profitability of 20% per annum.

Table 4: Benefit/cost ratios for horticulture

Fruit	Benefit/cost ratio
Pipfruit	10:1.
Kiwifruit:	
Orchard Hand	4:1 for 2.9 ha
Supervisor/Leading Hand	15:1 for 25 ha
Viticulture	5.7:1

4.2 Horticulture (Pipfruit, Kiwifruit, Viticulture) Industry

Employee training at orchard operational level

The work in the kiwifruit industry demonstrates the impact of the value of the final crop has on the return – Gold kiwifruit has twice the value in terms of return because of its market value.

Supervision training has a higher benefit/cost ratio because of the orchard area over which the training is effective.

Interviews with Employers

Staff Turnover: Forty five percent of viticulture employees thought that training resulted in higher staff turnover but only 16% of kiwifruit employers thought this. Conversely, 58% of kiwifruit employers and 36% of viticulture employers thought training resulted in improved staff retention. The difference may reflect differences in industry maturity. The kiwifruit industry is mature while the viticulture industry had been in a state of rapid expansion and trained staff were in short supply. Trained staff were often "head hunted" by other employers or staff could advance their careers more rapidly by changing employers.

The critical factors to achieve great results from training are:

- Motivation of the trainee.
- The support of the manager to coach, mentor and supervise.
- Effective leadership and workplace culture.

Table 3: Key Tasks, horticulture

Pipfruit	Kiwifruit	Viticulture
Crop thinning	Crop load management	Canopy management
Pruning	Canopy management/thinning	Pruning
Harvesting	Harvesting	Hand harvesting
		Machine harvesting
Pest and disease management	Pest and disease management	Pest and disease management
	Supervision	

4.3 Seafood Industry

Employee training for seafood processing

In terms of vocational training in seafood processing, senior managers were asked to identify three to four key areas where processing staff performance had a significant impact on significant impact on the performance of the company.

The areas identified were:

1. Hygiene and Sanitation
2. Health & Safety Compliance
3. Production/Productivity

Economic Value of Training in Seafood Processing

There are particular challenges to developing an economic value for training in the seafood industry because of the diversity of product and market value of that product. Hoki at $7,000/tonne to $60,000/tonne for rock lobster creates quite different economic loss if product is downgraded because of poor practice due to inadequate training. For this reason, we have calculated a number of economic benefits from data provided that give insight into the wide range of returns from training.

Seafood example 1: Pre-season training for "green" processing team at sea

Pre-season training was estimated to improve output in the first three weeks at sea by 27% and improve quality 1–2%. It was expected that the balance of the trip would be similar for the teams regardless of the pre-season training. The benefits were calculated from less time at sea to fill the boat and less quota fish downgraded to fish mince.

The benefit/cost ratio was estimated at 4.67:1 – i.e. a net $3.67 return on each $1.00 spent.

Seafood example 2: shore-based processing

A shore based factory estimates that it takes 160 hours of supervision and training over the first six months to take a new entry person up to a satisfactory level of performance and to offset risks. The production level of a new entry person will be about one third of a competent employee. In addition, 20% of their processing will go to waste compared to 1–2% of the competent employee (see Table 5).

Manager Perspectives

- Training is not always aligned to business goals but is often more compliance driven.
- The current qualifications tend to be too long and consequently had low completion rates. Shorter qualifications aligned to KPIs for specific roles would be more useful.

Table 5: Benefit/cost ratios for training in on-shore processing

Estimated value of training on annualised basis	$133,262
Estimated cost of training including supervisor and employee time	$8,400
Benefit Cost Ratio (i.e. for every $1 spent, there is a net return of $14.80)	**15.8:1**

Employee Perspectives

The three most highly rated benefits of training:

- Training helps me do the job better.
- It makes the job more interesting.
- I can do a wider range of jobs in the processing plant.

Employees believed that training made a difference in improving their productivity, with over half of those surveyed suggesting that it resulted in improved output by 10–20%.

If there was a gap identified in available training, employees thought that supervisor training in communication and team building would make a significant difference.

4.4 Hospitality Industry

The work done in the hospitality industry was done on behalf of four service industries working together as the Service Industries Training Alliance so the focus was on front-of-house service rather than on cookery.

(a) Employee training at front-of-house

In terms of vocational training in the hospitality industry, managers identified four key areas where operator performance had a significant impact on the hospitality outlet performance. Each area was associated with three-four key activities.

Key Tasks

Task 1: Providing customer service
Task 2: Product knowledge
Task 3: Working as part of a team to provide service

Benefit/Cost Ratios

While many employers/managers were able to describe the observable behaviours on the job by untrained, competent and best practice employees, they struggled to describe the impact of that on their business and, in particular, were unable to estimate the likely financial consequences of those differences.

Some examples were developed with individual outlets and one national quick service restaurant chain.

Hospitality industry example 1: Buffet style family restaurant

A shift towards a strong commitment to training with a new manager over the last six years has resulted in:

1. A reduction in staff numbers lifting productivity (customers served/staff member) by 12%. The ratio of part-time: full-time staff has changed from two thirds part-time to one third part-time.
2. A reduction in staff turnover from 150% per annum to 35% per year.

The manager claims her focus on training is a critical component of that improvement.

The estimated benefit from these changes is $39,248 per full-time staff equivalent.

The benefit:cost ratio was estimated at approximately 6:1.

Hospitality industry example 2: A service club operating a restaurant, bar, function centre, coffee bar and gambling facilities

The service club has invested significantly in training as a key to accomplish specific business goals.

- Improved service to members.
- More flexibility through multi-skilling staff.
- Improved productivity.
- Providing consistency of experience.

Results include:

- Improved operating surplus in restaurant.
- Cost savings through multi-tasking and reduced staff numbers on duty.
- Improved sales through upselling.
- Reduction in customer complaints.
- Improved mystery shopping "scores".
- Improved workplace culture.
- Better focused staff recruitment.

A benefit/cost ratio of at least 2:1 has been identified with many benefits unquantified.

Hospitality industry example 3: Quick service restaurants

The main quantifiable financial benefits have been from:

- Upselling.
- Reduction in complaints.
- Speed of service.

Other benefits in terms of food safety, health and safety, working as a team are important but difficult to quantify in dollar terms. The benefit:cost ratio was estimated at 3.5:1.

Interviews with managers/employers across different establishments in the hospitality industry identified some common themes:

- "Front-of-house" staff turnover is quite high and the job is frequently not treated as a career option.
- The part-time nature of front-of-house work influenced the investment in training by employers.
- Higher-end restaurants invested more heavily in training systems to differentiate their businesses.
- Smaller businesses struggled to find time for staff training. Finding time for assessment was often seen as a barrier.
- Use of suppliers for "free" training was common, eg wine supplier for wine awareness, coffee supplier for barista training.
- The larger businesses that invested in training and manage it well saw good benefits, although measurement of this was generally weak.

5. Conclusion

The Applicability of the RVA Methodology for Identifying and Reporting Value Added from Training

The RVA methodology is relatively straight forward to use in industries where employee effort can be measured in terms of output volume and quality which can be directly measured in financial terms. Secondly, its use is also more relevant where the industry output is relatively homogenous in value.

Consequently, benefit cost ratios were established for the quarrying industry (within the extractives industry) and the pipfruit, kiwifruit and viticulture industries (within the wider horticulture sector).

The wide range in seafood product prices from $7,000/tonne for Hoki to $60,000/tonne for rock lobster creates quite variable benefit cost ratios for training in areas such as improving product recovery. Consequently, developing a benefit-cost ratio for training in seafood processing was challenging. This would be true for other industries with a heterogenous product with a wide range in market values.

Even within industries where benefit cost ratios were able to be established, it was not possible to apply the methodology to training in activities such as compliance with health and safety, fishing quota, food safety and environmental regulations.

In theory, it would be possible to do this using sufficient subjective risk assessments by experienced industry personnel. However, the authors found that there was insufficient experience and/or willingness to make estimates about the change in risk from compliance training and the possible savings in product rejection, fines and other costs associated with non-compliance. Given the amount of compliance training carried out in the ITO sector, this is an important area for future research.

The methodology was also difficult to apply in the hospitality industry, which was not unexpected given the nature of the industry.

While hospitality employers could describe the observable differences in practice by employees with different levels of skill, they struggled with quantifying the impact this had on their business and providing estimates for the financial consequences that this produced for the business.

It is the "clear line-of-sight approach" between Key Performance Indicators (KPIs) for the business, employee contribution to the KPIs through the application of skills and the training delivered to lift those skills that are central to the added-value approach. When managers say that they do not understand what half or a third of the qualification is about, or that it has no relevance for their business, then there is scope for an added-value approach to be taken by an ITO when reviewing Unit Standards or qualifications.

Training and Management Systems

The studies identified that training is just one factor among many that impact on the performance of staff. Critical factors include:

- The opportunity for the trainee to apply the new skill and knowledge.
- The calibre of management.
- The quality of recruitment and the commitment of staff.
- Alignment of training objectives and company strategic direction.
- Clear company operating policies and procedures.

The return on investment from training is influenced by these non-training factors. The Valued Added Approach measures the impact from all these factors.

When considering the value added of training in the workplace, there is a need to think beyond the training event and the acquisition of discrete skills and knowledge, to alignment with business goals, integration of training with performance and operating systems, and supportive management systems.

Brinkerhoff and Dressler (2002) criticised Return on Investment (ROI) methods of evaluating the impact of training. "In evaluating the transfer of skills and knowledge into the workplace from training, we are measuring the management and performance systems rather than training alone. The training function assumes questions about instructional quality and the design of the training programme to meet training needs and how well it is integrated with the business performance system. The management function looks at how learning is applied, identifies obstacles and facilitating factors and considers how effective performance is."

Training for Managers and Supervisors

While the objectives of this project were not specifically focused on the value of training supervisors and managers, there were a number of case studies completed.

The case studies for the extractives, services and seafood industries indicated strong gains in productivity where the individual supervisor/manager trainee was able to implement the learning gained. The kiwifruit study showed a benefit/cost ratio of 15 for the training of leading hands/supervisors compared to 4 for "orchard hands".

In particular, a number of supervisor trainees commented on the value gained from learning and applying skills in training staff, assessing competence and to identify training needs with a "line of sight" to business goals and KPIs and to implement training activities and coaching to enable staff to meet the required level of performance.

While supervisor/first-line management training was identified as important to all four sectors in our study, a comment from one restaurant owner reminded the authors that the training of supervisors was not a substitute for not training all employees. The restaurant owner identified employees who could work unsupervised as adding real value to their business. Customer service is the culture of the business and requires attention to detail – service, personal engagement and sensing of customer need. This cannot be delivered through closely supervised but poorly trained staff.

6. Themes

Four themes emerged from the studies completed.

Theme 1

Training must be linked into management systems and have strong management support to get high returns.

Industry Training Organisations need to:

- Connect well with management – both at senior and at operational level
- Understand company Standard Operating Procedures/Key Performance Indicators (SOPs/KPIs) and performance systems and how training supports these and improves performance
- Be part of firm's HR/manpower planning in identifying training needs and solutions

Theme 2

For the SME market, Industry Training Organisations need to consider provision of additional HR support system for many managers and businesses. This could include:

- Training-needs analysis
- Performance management system to measure the results of training
- On-the-job training/assessment skills for managers and supervisors
- Developing workplace culture/organisation for high performance

Theme 3

On-job task based assessment systems seem to be preferred by employers but simpler, less bureaucratic systems are required with good Recognition of Current Competence/Recognition of Prior Learning (RCC/RPL) attributes, and job specific/company SOP application.

Theme 4

There appears to be a significant market for improved training for supervisors/managers and particularly:

- How to get value from training
- How to train on the job
- How to assess competence/performance
- How to manage staff
- How to identify/satisfy training needs with line of sight to business goals and KPIs

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