ISSUES PAPER

NCVER

UNEVOC Network

Evaluation framework measuring Return on Investment (ROI) in TVET

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NATIONAL CENTRE FOR
VOCATIONAL EDUCATION RESEARCH

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Acknowledgements

This report forms part of a larger suite of work around understanding the returns on investment (or additional investment) in Technical and Vocational Education and Training (TVET) and development of an ROI evaluative framework for UNEVOC members being undertaken with the support of the United Nations Educational, Scientific and Cultural Organization (UNESCO) UNEVOC International Centre in Bonn Germany and the Korean Research Institute for Vocational Education and Training in Seoul, Korea.

Introduction

This issues paper focuses on the key findings and issues about measuring Return on Investment (ROI) from Training featured in existing TVET studies and literature. It considers the factors and elements involved in the measurement of ROI from a 'triple bottom line' perspective: that is, the economic, social and community benefits in the TVET sector across multiple stakeholders. It aims to inform and support progress towards establishing an international framework to better measure the ROI in TVET.

An initial review of the literature indicates that ROI in TVET is context specific to the stakeholder and relative to the environment. The outcomes are embedded in different national structures, nature of the training and definitions of TVET systems (OECD, 2008). Furthermore there are many layers and dimensions to ROI measurement.

To better understand how to measure ROI in a vocational context requires an overarching view. This paper highlights the elements of ROI and outlines a guide to an evaluative framework that focusses on methods and processes to measure ROI. This includes setting up the scope and purpose of the framework, developing guiding principles, establishing an ROI model, identifying costs, benefits and factors that impact on ROI and presenting an approach to data collection. It aims to provide a better understanding of the ROI process and points out factors and key questions to consider for ROI implementation.

The paper begins with a brief summary of key findings followed by an outline of an evaluative framework within which to begin to discuss underlying issues around measuring returns. The tabled examples and key questions featured in each stage of the framework aim to highlight the decisions necessary to produce a cohesive model. Consideration of this approach will help to build a pathway to developing a united ROI model to create the most effective measurement tool for ROI in TVET.

Key observations

An initial review of studies measuring Return on Investment (ROI) indicates:

- ROI is context specific to the stakeholder and relative to the environment. The outcomes are embedded in different national structures, nature of the training and definition of TVET systems (OECD, 2008). Each study or statistical dataset have their own contextual underpinnings.
- ROI measurement is often economic in nature (Independent Economics 2013) with recent studies endeavouring to incorporate social impact (IIP, 2012), for example - Social Return on Investment Model (SROI).
- ROI is measured in terms of evaluative or forecasting measurement tools.
- The two main training influences are through improved employability and increased productivity (Independent Economics, 2013)
- Costs and total investment are generally underestimated. Indirect costs such as foregone opportunities are more difficult to measure.
- The direct costs of training are generally known and expressed in monetary terms, but the benefits may be subjective and difficult to quantify for monetary conversion (Barker, 2001)
- Benefits may arise at different points in time (OECD, 2008). There are tangible and intangible returns.
- Selecting output measures and analysing and interpreting results highlight the impracticality or impossibility of controlling for all variables, difficulties in isolating the benefits of training and quantifying all costs and benefits. There are differences in expectations of what can be measured and what can be monetised.
- Understanding the factors that impact the results are as important as the costs and benefits. The multitude of influences include stakeholder characteristics, type of training program, industry, methodology, data quality; and population of interest, measurement of time, nature of the data and statistical methods (Long and Shah, 2008).
- The cost-benefit analysis ratio can be an estimate of the impact of a particular training event. The degree of which it is an estimate of returns depends on the quality of the data that are used to calculate the ratio.
- ROI cost-benefit models that use an indicator of benefits relative to costs may be a starting point only. Issues of data availability, completeness, quality and usefulness impact on the integrity of the data (Brown et al, 2015).

Background

Context

To develop a Return on Investment (ROI) evaluative framework requires understanding the Technical and Vocational Education and Training (TVET) context. A preliminary review of the literature leads to the initial conclusion that an aggregated cost-benefit analysis is challenged by variations in TVET systems and ROI methodology (OECD, 2008). It is context specific and impacts on the definition and calculation of TVET costs and benefits. Hence the outcome from any ROI analysis tends to be relative and restricted to a specific environment.

To begin the process of developing a framework upon which to make progress towards a united ROI model and gather data to inform stakeholders of important and useful measures, first requires a profile of these contextual underpinnings. These include the following:

- Definition and provision of TVET systems
- National economic structures in which TVET systems are embedded
- Nature of TVET (e.g. in schools/workplace)
- Specific occupation/industry of focus
- Characteristics of students within specified groups

Developing a brief TVET profile enables the many layers and dimensions of ROI to be represented in the right context and the outcomes interpreted with integrity. For the purposes of this paper, Technical and vocational education and training (TVET) is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods. TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels and includes work-based learning and continuing training and professional development which may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn, the development of literacy and numeracy skills, transversal skills and citizenship skills are integral components of TVET[1].

Key questions

1. What are the contextual underpinnings of TVET specific to your environment?
2. What is a working definition for ROI in TVET?

Scope

This initial project focussed on investigating studies relating to multiple stakeholders – including individuals, organisations and the economy – across a three tier model of economic, social and environmental impact. However outcome measures tended to have a stronger economic focus (Independent Economics, 2013), with less attention on the social/community and personal gains from training that are less clearly measurable (CEDEFOP, 2013).

1 Source: http://unesdoc.unesco.org/images/0023/002341/234137e.pdf

Although this paper separates individuals, organisations and the economy to provide examples for developing an evaluative framework they are not independent of each other. There are flow-on effects (CEDEFOP, 2013). However some individual returns many not hold at a societal level.

There are many layers and dimensions to measuring ROI. Defining a specific statement of scope keeps this measurement practical and focussed. (For example, the social returns to organisations from workplace literacy training – is specific and clear).

Key questions

1. Who are the stakeholders?
2. If the stakeholders are individuals, which specified group?
3. If the stakeholders are organisations, which industry?
4. What level of impact to consider – economic, social and/or environmental?
5. What measures are most important and useful?
6. What is the nature of the training? (e.g. in schools/workplace)
7. What is the field of study?

Purpose

Clarity of purpose is integral to implementing a Return on Investment Framework. This maintains focus and helps to specify the parameters. Studies have used ROI for various reasons. These include business improvement through supporting new technologies and improving workforce efficiency, workplace health and safety learning (Brown, et al 2015) and as part of funding agreements (IPP, 2012).

Key questions

1. Why are stakeholders measuring ROI?
2. How will ROI information be used?

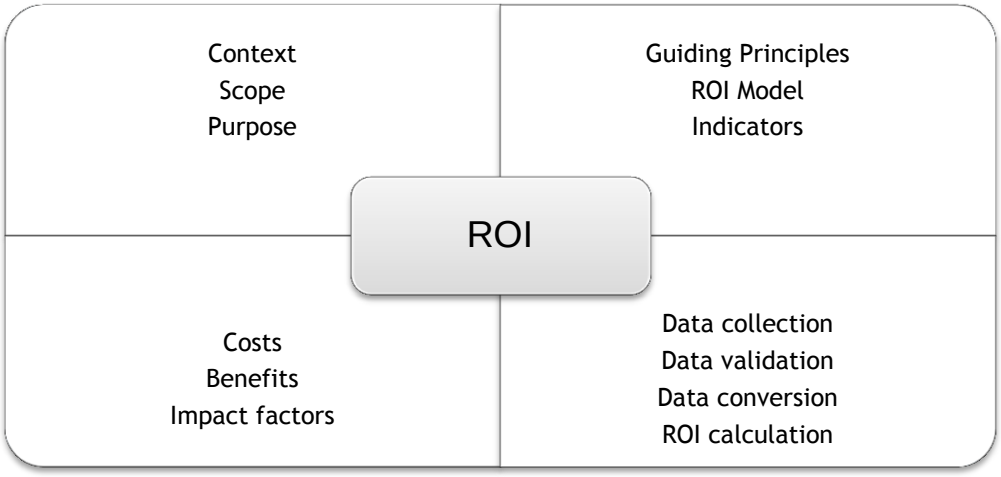
ROI Evaluation Framework

The purpose of this paper is to highlight the issues involved with structuring an evaluative ROI framework that aims to:

1. Develop a practical, coherent and transparent methodology
1. Measure on the basis of selective and useful variables and
2. Produce the most compelling evidence possible based on what data are available.

A review of the issues in measuring ROI in the literature helps to identify the key elements that constitute an Evaluation Framework. These are represented in the diagram in Table 1.

Table 1 ROI Evaluation Framework elements



Context, scope and purpose, as discussed in the first section of this report, form the foundation of the framework. The other components are presented separately in the following sections along with steps and methods to guide the process.

Guiding principles

The first step is to develop guiding principles to follow and apply a consistent and standard frame of judgement to the ROI evaluation. These include the following:

1. The ROI model/method adopted:
    a. Must be customised, fit for purpose and add-value.
    b. Requires an overarching clarity of purpose
    c. Measures factors that matter
    d. Measures factors that are specific, in context and within an identified group.
2. The implementation of the ROI model considers:
    a. Is it practical and useful?
    b. Is it feasible? How much resourcing does it require?
    c. Is it agreed upon by all stakeholders?

d. Can it be used for different types of training?

e. Does it cater for a range of measures and data sources?

f. Can it be used before, during and/or after training?

g. Does it meet the need for useful information?

3. The development of the methodology and data collection instruments/processes and instructions:

    a. Place minimal administrative load on the stakeholders

    b. Ensure the instruments are capable of being customised to particular contexts

    c. Be sufficiently specific about the data elements required.

4. A compilation of credible evidence about the impact of training must satisfy a number of requirements:

    a. The data must be of sufficient quality

    b. The techniques applied must be scientifically valid, and

    c. The analysis should address the possibility that training may not be the only factor explaining changes in performance.

Guiding questions

1. What type of ROI model is fit for purpose?
2. What ROI measures are most important to the stakeholder?
3. What are the approaches to data collection and analysis?
4. What level of training costs should be collected?
5. What level of training benefits can be captured?
6. What factors might impact on the results?

What type of ROI model is fit for purpose?

Return on Investment (ROI) is generally a measure of the monetary benefits obtained over a specified time period in return for an investment in a training program. It is the extent to which the benefits of training exceed the costs.

Table 2 Return on Investment models

ROI Model	Description
Cost Benefit Analysis (CBA)	Assigns monetary value to costs of the training program to determine the cost-benefit ratio.
Internal Rate of Return (IRR)	Rate of interest that equals the returns from an investment to the cost of the investment.
Kirkpatrick/Phillips Evaluation Model	4 Levels of Evaluation – Reaction, Learning, Behaviour, Results plus Level 5 ROI that converts 4th level to monetary value.
Net Present Value (NPV)	Compares the value of money now with the value in the future.
Return on Expectation (ROE)	Estimates returns to training relative to stakeholder expectations. Uses surveys and interviews.
Social Return on Investment (SROI)	Stakeholder driven evaluation with cost-benefit analysis and strong focus on social impact.

Note: All data sources are listed in Appendix 1. SROI Model and Case Studies are presented in Appendix 2, 3 and 4.

TVET research studies use various models to determine Return on Investment. These models include measuring economic and social impact (SROI). Some examples of ROI models are shown in Table 2. Different models may suit specific types of data. The decision to include economic and social returns will influence the selection of the ROI model along with the choice of an evaluative or forecasting perspective. The best fit model enables customisation, adds value and measures factors that matter and are specific.

Further information relating to the SROI model is featured in Appendix 2, Lessons learned in Australia in Appendix 3 and Case Studies in Appendix 4. A summary of results from the Kirkpatrick/Phillips Evaluation Model are also presented in Appendix 5.

Key questions

1. What type of ROI model is appropriate – evaluative or forecasting?
2. Do we measure economic and social impact?
3. Which model is best for social impact?
4. Do we consider an integrated/combined model?
5. Can we customise the ROI model?
6. Does the ROI model add value?
7. Does each indicator require a different (or specific) measurement model?

What ROI measures are most important?

There are many layers and dimensions to ROI measurements. They are different for each stakeholder. There are economic and social aspects. Economic impact is more easily measured but it is the social impact that completes the whole ROI picture. The studies indicate that the social implications of training are most important to understand as they provide a true value of training that is often neglected in TVET research (due to difficulty in measuring). Table 3 shows a sample of ROI indicators for individuals, employers and the economy.

Table 3 ROI indicators by stakeholder

Individuals	**Employers**	**Wider community**
Job related	*Market*	*Economic*
Employability	Productivity	Labour market participation
Productivity – skill gains	Efficiency	Labour force productivity
Earning capacity	Employee workplace literacy	Increasing the tax base
Foundational skills - literacy	Employee skill gains	GDP
Training pathways – vocational/higher education.	Business innovation	
Non job related	*Non market*	*Social*
Wellbeing	Organisational culture	Social cohesion
Engagement	Motivated workforce	Social inclusion
Satisfaction	Employee well-being	Health and wellbeing
Self-esteem/confidence	Employee work practices	Crime reduction

Note: All data sources are listed in Appendix 6 and 7.

For individuals, many studies report on economic impact. The two main training influences are through improved employability and increased productivity (Independent Economics, 2013). However there are non-job related gains that are also a result of training reflected in self-confidence, well-being and engagement (NVEAC, 2011). The ROI measurement outcome is also influenced by the intent of the individual with reasons for undertaking training ranging from promotion, vocational/higher education pathway to personal development.

Organisations and employer's training outcomes are commonly analysed by productivity gains and efficiency (AWPA, 2013). In addition there are non-productivity returns through employee well-being, work practices and organisational culture. The reasons for committing to TVET training also goes beyond productivity to legislative and licensing requirements, introducing new technologies (Smith et al 2009) and other business improvements.

Key questions

1. Who is the stakeholder?
2. What are the measures that really matter?
3. What measures are the most useful and valuable to stakeholders?

Approaches to data collection and analysis

To begin the data collection process and analysis requires the following steps:

1. Prepare information to guide the data collection process.
2. Establish what data sources exist and establish the quality and availability of the data.
3. Determine which level of evaluation to use. This is dependent on the data availability/ quality and resourcing implications of collecting new data or translating existing datasets into a form useful for the evaluation.
4. Control for or acknowledge the factors that impact on ROI
5. Indicate how data is collected and how calculations are derived.

A flow chart illustrating the process of measuring ROI within the Evaluative Framework is presented in Figure 1.

Steps 1 and 2 are explained in the information that follows, Step 3 is explained in the Training Costs and Benefits section, Step 4 in Factors that Impact on Training section and Step 5 in the Data Issues section.

Prepare information to guide the data collection process

- Decide on the sampling of programs.
- Customise a set of generic data collection instruments and supporting instructions.
- Develop principles guiding the development of tools and processes that place minimal administrative burden on stakeholders and ensure that they can be implemented across contexts.
- Define data elements/indicators.
- Provide detailed examples and possible data sources identified in supporting instructions and documentation.

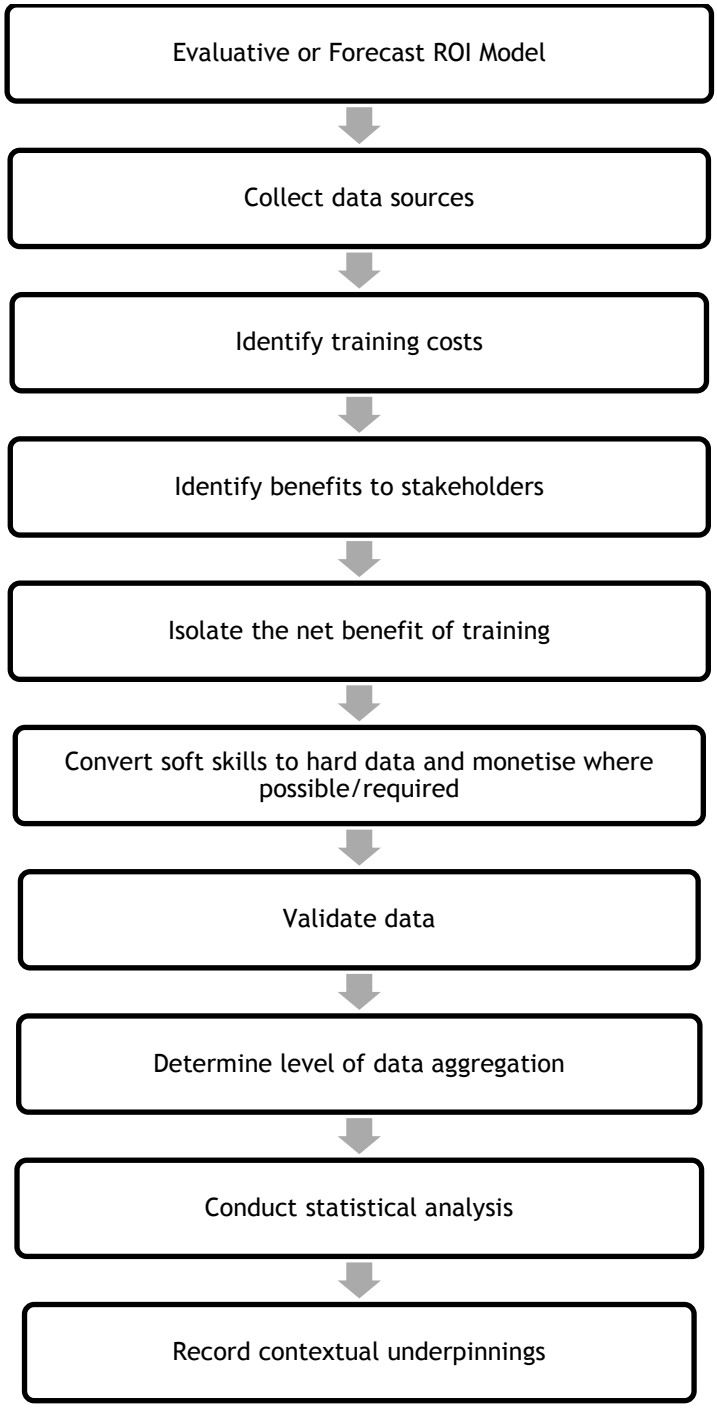
Data collection – establish existing data sources

- Establish existing data sources and identify types of quantitative and qualitative datasets e.g. national data collections, administrative datasets, longitudinal studies, surveys, interviews and case studies
- Determine data availability and accessibility
- Determine the completeness of the data and data quality
- Identify information gaps (and resources required to collect relevant information if necessary)
- Collect information at defined data collection points.
- Record the contextual underpinnings

Key questions

1. What existing data sources can be used to measure ROI in TVET?
2. Is this information accessible?
3. Where are the information gaps?
4. What is the data quality and completeness?
5. What are the contextual underpinnings?

Figure 1 Measuring ROI process



Training costs

Training costs and total investment are generally underestimated. There are two categories of costs - direct and indirect costs. These costs differ by stakeholder and attributes of the specific training program. TVET costs are paid by students, businesses, industry, training providers and the community and data may be difficult to collect. Table 4 provides an example of individual and employer costs associated with training.

Table 4 Training costs by stakeholder

Individual	Business/employers	Government
Direct costs Tuition Books and materials Equipment (e.g. computer) Childcare Travel/parking Special fees (e.g. library) Opportunity costs Foregone or reduced earnings while studying Non-completion costs	*Direct costs:* Course costs for employee Salary of staff while on training Course design and development *Intangible costs* Loss of productivity while trainees are attending course Induction costs Costs of replacing employee while attending course Higher wastage rates until the trainee is fully proficient Missed opportunity costs	In addition to public expenditure *Indirect costs through* Payroll tax rebates Workforce development programs Completion bonuses of employers of apprentices

Note: All data sources are listed in Appendix 6 and 7.

Direct costs are more easily measurable. For individuals these costs can vary. Costs can vary between courses, providers and with concession (Watson, 2005) where subsidies and student vouchers provide external financial support. Requirements of the industry and field of study may require additional equipment, materials and for some protective clothing to be purchased. As an employee, these tuition costs are paid by the employer. However accessing cost data at the business level may be difficult (AWPA, 2013).

Indirect and intangible costs are not as clearly quantifiable or easily captured. For example older students may need to pay for childcare or forgo employment for a period of time and absorb loss of income. Employers also bear the costs of not having adequately skilled employees that are not fully proficient at their job, lost time while employees are in training and increased workloads in their absence (NCVER, 2013). Intangible costs may also be difficult to convert into monetary terms.

The point in time when training costs data are collected impacts on the resulting Return on Investment. Costs can be measured over different periods of time - before the training, upfront, during the training or part of on-going costs (OECD, 2008). The point in time capture of cost data is an important factor of the evaluative or forecasting ROI analysis.

Key questions

1. What are the direct costs?
2. What are the indirect costs?
3. Who pays for the training?
4. Do the costs differ by industry?
5. Over what period of time are the costs calculated?
6. Are intangible costs measurable?
7. How can we measure intangible costs?
8. Can or should intangible costs be converted into monetary value?

Training benefits

Benefits are defined in various ways, arise at different points in time and are sometimes difficult to quantify (OECD, 2008).

There are two categories of benefits – market and non-market. In the workplace, for example, these refer to job related and non-job related outcomes. Table 5 illustrates some of these benefits for individuals, organisations and the economy.

Market benefits are directly measurable and relative to the stakeholder group. The main benefit of TVET that influences pre-tax earnings of individuals is improved employability (Long and Shah, 2008) and for the economy increased participation in the workforce.

Non-market benefits are not so easily quantifiable. Employee social and well-being aspects or business workplace literacy, safety and workforce flexibility are more difficult to measure. Outcome measures tend to have an economic focus, excluding community and personal outcomes that are more difficult to quantify (OECD 2008). A model that takes both market and non-market benefits is recommended (CEDEFOP, 2013).

Table 5 Benefits of TVET training by stakeholder

Individuals	Employer	Economy
Job related	*Market*	*Tangible benefits*
Higher employability	Productivity	Higher employability
Employment	Sales & profitability	Increased participation in the workforce
Higher salaries	Customer service and satisfaction.	Decrease in unemployment levels
Higher savings levels	Occupational health & safety	Productivity gains
Improved working conditions	Quality product & services	Higher skilled workforce
Professional mobility	Saving on material & capital costs.	
Productivity (highly skilled)		
Non-job related	*Non-market*	*Intangible benefits*
Higher education pathway	Motivated workforce	Improved health
Pathway to further study	Improved organisational climate and culture.	Improved environment
Improved self esteem	Increased literacy in workplace	Reduced national crime
Communication skills	Employee skill gains	Increased social cohesion
Engagement	Employee well-being	Increased social inclusion
Improved problem solving	Employee workplace practices	Strengthened social capital
Improved health & wellbeing		Active citizenship
Improved economic standards of living		Technological change adaptation
Life satisfaction		
Social inclusion		

Note: All data sources are listed in Appendix 6 and 7.

Benefits also vary depending on the stakeholder's perspective. Table 6 illustrates tangible and intangible benefits of training to an employee and those of the employer. The table indicates the individual (employee) benefits cover improved earnings, skills and work practices while the employer benefits are concerned with productivity, compliance, safety and quality.

Table 6 Benefits of Training for Employees and Employer

Benefits	Employee	Employer
Tangible	Improved employee pay	Increased productivity and efficiency
	Improved language & literacy	Increased sales and profitability
	Improved technical skills	Improved product quality & services
	Increased use of new technologies	Improved customer service and satisfaction levels.
	Improved workplace practices and procedures.	Improved OHS
Intangible	*Social and well-being*	Better management and employee workplace relations
	Improved self-confidence & morale	More co-operation among employees
	Reduced stress	Reduced internal conflicts
	Improved motivation	Developing a learning culture
	Improved work ethic	Supporting social cohesion and inclusion
	Improved physical and mental health	
	Job satisfaction	

Source: Adapted from Barker 2001 and Moy and McDonald 2001 in Brown et al 2015 Workplace Literacy Pays, ACER
Note: A detailed list of benefits is presented in Appendix 7.

Time duration - Benefits may arise at different points in time and may extend well beyond the final offering. The payback period could be projected one to five years. The period of time data points may cover - during a training program, at its completion or long after the event (OECD, 2008).

Table 7 illustrates a comparison of the short and long term benefits to the individual, organisations and the economy. Medium to long term benefits such as mobility or the capacity to upgrade skills later in life are more difficult to quantify (OECD, 2008). The value-chain of benefits needs to be considered to fully capture more accurate returns of training.

Table 7 Short and long term benefits of training by stakeholder

Benefits	Individual	Employer	Economy
Short-term benefits	Employment opportunities Increased earning levels Work satisfaction	Higher productivity from trained workforce. Saved costs from recruiting external skilled workers Improved quality of products and services. Improved customer satisfaction levels.	Reduced reliance on welfare Social cohesion
Long-term benefits	Greater employee flexibility and mobility Lifelong learning	Reduced employee turnover. Improved safety record. Better workplace relations.	Productivity gain from educated workforce. Increase in tax income from higher earnings.

Source: Costs and Benefits in Vocational Education and Training 2008 OECD
Source: Adapted from Barker 2001 and Moy et al 2001.

Key questions

1. What are the tangible benefits?
2. What are the intangible benefits?
3. Should intangible benefits be converted to monetary value? (e.g. well-being)
4. How can intangible benefits be monetised/quantified?
5. What are the short, medium and long term benefits of training?
6. When are the most important data collection points?

Costs and Benefits – the relationship

Additional issues to consider relating to costs and benefits in the ROI analysis are indicated by Barker 2001:

- Collecting data on the monetary value of performance may tend to bias information making it hard to present an accurate picture.
- The costs of training are more likely to be known and expressed in monetary value, but the benefits may be subjective and difficult to quantify for conversion.
- Costs are known upfront, before training, but benefits may accrue over time, and it may be difficult to determine when to assess the impacts or benefits.
- Training programs/courses may be offered without expectation of return e.g. orientation of new employees, retirement planning while popular training programs may still be operated even if costs exceed benefits.

Subjective data can be converted into hard data if required or where possible. The Guide to Social Return on Investment (2009) indicates value ranking and relative value as possible conversion strategies. Should the intangible data be monetised?

Key questions

1. How can intangible benefits be measured and quantified?
2. What is an appropriate method/process to convert soft to hard data?
3. Should subjective measures be monetised?

What factors impact on the results?

There can be many influences on the outcomes of ROI analysis. These are as important as costs and benefits to an accurate picture of returns on investment.

Table 8 illustrates a summary of determinants that range from individual characteristics of age and level of qualification to the size of an organisation to the quality of the trainer.

If for example, training works better in the workplace than the classroom; in collaboration rather than self-directed; associated with a specific application (e.g. new technologies) or for those already possessing sound foundation education and skills - then we need to isolate and control for these variables to ensure that the ROI outcome is a direct result of the training.

Table 8 Types of factors that impact on the ROI results

Category	Description of factor
Stakeholder characteristics	Individual's demographics – age, educational attainment, level of schooling (often different calculations), apprentice. Employers/business – size of organisation, industry, private/public, (type of employee training)
Training status	Qualification completers or module completers Part-time or full-time status Reskilling or Upskilling
Training Programs/Course	Qualification level Non accredited vs accredited training Training level – e.g. foundational – literacy & learning. Industry/field of study Types of training e.g. leadership, management, innovation, apprenticeship Initial TVET or on-going training. (e.g. apprentices/trainees) Highly specific or general training (more transferable)
Training Context	TVET in schools (teacher quality, student engagement, employer relationships (relevant/effective) - training pathways, material resources. Workplace training vs classroom training Training in partnership vs self-directed.
Training Provider	Private vs Public Quality of trainer Quality of resource materials
Labour market	Demands for skills, Labour market regulations, Trade union influences

Source: Adapted from Measures of Success Research Framework 2011. Human Resources and Skills Development Canada (In Brown et al 2015 Workplace Literacy Pays, ACER).

Note: Data sources are listed in Appendix 6, 7 and 8.

The ROI estimates can also vary in other ways. Long and Shah (2008) identified the reason for the variations in the estimates can be the result of:

- The nature of the data being analysed – e.g. longitudinal, sample population.
- The population – e.g. young vs working population, all or full-time workers.
- Measurement and calculation of variables.
- Earnings or employment = gross or after tax, income or earnings per hour, or per week?
- Educational qualifications – use higher educational attainment, level of schooling or multiple qualifications? What qualification aggregation levels are appropriate?
- Comparisons among educational achievement – early school leavers, school completers, no post-school qualifications
- Control for variables – statistically controlling for varying combinations of characteristics e.g. wide variety of personal demographics, prior educational attainment and employment characteristics
- Statistical techniques – selected statistical approaches can control for variables to reduce their effect on the results such as regression or multivariate analysis that isolate the effect of education on labour market outcomes.
- Measurement of time – age of the person vs outcomes across a person's years of labour market experience across time.

Key questions

1. How to we define and calculate earnings?
2. How should educational qualifications be aggregated?
3. How can we control for variables that impact on results?
4. What statistical techniques can be used to isolate the effect of training?

Data issues

There are additional data issues to consider that impact on the ROI results and interpretation of any analysis.

1. Impact of sample size, population characteristics and type of study (e.g. longitudinal)
2. When reporting training results, credibility is always an issue. It is crucial that the data be accurate and the conversion valid.
3. Each layer of assumption, estimation and subjective judgement reduces the scope to replicate or generalise in other contexts.
4. The variation in method and its application may explain the findings as much as the input data.
5. Are these predictive or retrospective ROI measures?
6. Time horizons – short or long term benefits, snapshot or duration of outcome period.
7. Data completeness and timeliness impact on the accuracy of results.
8. Integrity of the data
    - Validity – Does it measure what it is supposed to measure?
    - Reliability – Is the data consistent and reproducible?
9. Degree of aggregation – training programs can be categorised into different categories. For example, individuals vs groups of individuals (e.g. employees/apprentices), from multiple sites or whole of the organisation at unit level by subgroup.
10. Data comparability requires:
    - The same definitions and the same point in time
    - To establish what we are basing comparisons on.
    - To establish what is comparable and what is not directly comparable.
11. Data transparency – to establish a more accurate interpretation of the ROI results requires:
    - Defining the contextual underpinnings of each stakeholder
    - Providing a narrative to explain any differences or anomalies in the data
    - Presenting a description of data quality, completeness and data gaps and
    - Highlighting any data limitations

These issues need to be considered in the collection, analysis and interpretation of the data.

Key questions

1. Is the data valid? Does it measure what it is supposed to measure A?
2. Is the data reliable? Is the data consistent and reproducible?
3. What is the degree of data aggregation?
4. Is the data comparable?
5. What are the contextual underpinnings of the data?

Summary of key questions

Context

1. What are the contextual underpinnings of TVET specific to your environment?
2. What is a working definition for ROI in TVET?

Scope

1. Who are the stakeholders?
2. If the stakeholders are individuals, which specified group?
3. If the stakeholders are organisations, which industry?
4. What level of impact to consider – economic, social and/or environmental?
5. What measures are most important and useful?
6. What is the nature of the training? (e.g. in schools/workplace)
7. What is the field of study?

Purpose

1. Why are stakeholders measuring ROI?
2. How will ROI information be used?

ROI Evaluation Framework

Guiding questions

1. What type of ROI model is fit for purpose?
2. What ROI measures are most important to the stakeholder?
3. What are the approaches to data collection and analysis?
4. What level of training costs should be collected?
5. What level of training benefits can be captured?
6. What factors might impact on the results?

What type of ROI model is fit for purpose?

1. What type of ROI model is appropriate - evaluative or forecasting?
2. Do we measure economic and social impact?
3. Which model is best for social impact?
4. Do we consider an integrated/combined model?
5. Can we customise the ROI model?
6. Does the ROI model add value?

7. Does each indicator require a different (or specific) measurement mode?

What ROI measures are most important?

1. Who is the stakeholder?
2. What are the measures that really matter?
3. What measures are the most useful and valuable to stakeholders?

Approaches to data collection and analysis

1. What existing data sources can be used to measure ROI in TVET?
2. Is this information accessible?
3. Where are the information gaps?
4. What is the data quality and completeness?
5. What are the contextual underpinnings?

Training costs

1. What are the direct costs?
2. What are the indirect costs?
3. Who pays for the training?
4. Do the costs differ by industry?
5. Over what period of time are the costs calculated?
6. Are intangible costs measurable?
7. How can we measure intangible costs?
8. Can or should intangible costs be converted into monetary value?

Training benefits

1. What are the tangible benefits?
2. What are the intangible benefits?
3. Should intangible benefits be converted to monetary value? (e.g. well-being)
4. How can intangible benefits be monetised/quantified?
5. What are the short, medium and long term benefits of training?
6. When are the most important data collection points?

Costs and Benefits – the relationship

1. How can intangible benefits be measured and quantified?
2. What is an appropriate method/process to convert soft to hard data?
3. Should subjective measures be monetised?

What factors impact on the results?

1. How to we define and calculate earnings?
2. How should educational qualifications be aggregated?
3. How can we control for variables that impact on results?
4. What statistical techniques can be used to isolate the effect of training?

Data issues

1. Is the data valid? Does it measure what it is supposed to measure?
2. Is the data reliable? Is the data consistent and reproducible?
3. What is the degree of data aggregation?
4. Is the data comparable?
5. What are the contextual underpinnings of the data?

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List of Appendices

Appendix 1

Examples of ROI Models

ROI Model	Study	Description
Cost-Benefit Analysis (CBA)	Independent Economics (2013)	Cost-benefit analysis assigns a monetary value to costs of the training program to determine a cost-benefit ratio. **Limitations**: Uncertainty in quantifying and assigning a monetary value to intangible items.
Internal Rate of Return (IRR)	Long and Shah (2008)	Rate of interest that equals the returns from an investment to the cost of the investment distributed over time.
Kirkpatrick/Phillips Levels of Evaluation Model	Brown, Taylor, McKenzie and Perkins (2015)	Four-level framework: Levels include (1) Reaction (2) Learning (3) Behaviour (4) Results. Each level is completed in sequential order. Level 5 ROI converts 4th level to monetary value.
Return on Expectations (ROE)	Mavin, Lee & Robson (2010)	ROE is the process of estimating returns to training relative to stakeholder expectations. Requires the training program to be tied to stakeholder and performance (gaps) and business needs. Uses surveys and interviews to assess what data is available against the perceptions of stakeholders. **Limitations:** Data can be highly subjective (e.g. worker engagement, perceived productivity, self-confidence).
Net Present Value (NPV)	GBDBIS (2015)	Compares the value of money now with the value of money in the future, taking into account all the costs that are associated with that monetary figure. The calculations include the initial costs as well as benefits or profits that are derived in the future. A positive NPV indicates the current investment is better than the alternative investment. A negative NPV indicates the alternative investment or not borrowing is better.
Social Return on Investment (SROI)	IIP (2012)	Stakeholder driven evaluation with cost benefit analysis tailored to social purposes. It identifies economic and social value. It places a monetary value on social impact. **Limitations**: It is difficult to compare results between organisations and attributing monetary values to social outcomes.
Return on Training Investment (ROTI)	Moy and McDonald (2000)	Used in contexts where training is evaluated to identify a range of quantitative and qualitative benefits produced by investing in learning and development. **Limitation**: Terminology can be confusing and redundant.

Appendix 2

Social Return on Investment (SROI)

DEFINITION

- Stakeholder-driven evaluation with cost-benefit analysis tailored to social purposes. It identifies economic and social value.
- Places a monetary value on the social impact of an activity and compares this with the cost in creating that benefit.
- SROI is based on program logic (theory of change) – inputs are applied to activities to produce outputs from which outcomes are derived, which result in impacts. It examines the relationship between inputs and impact.

TYPES OF SROI

1. **Evaluative** – conducted retrospectively and based on actual outcomes that have already taken place – social value created in the past.
2. **Forecast** – predicts how much social value will be created if the activities meet their intended outcome – social value to create in the future.

PRINCIPLES

1. **Involve stakeholders** – Inform what gets measured and how this is measured and valued.
2. **Understand what changes** – Articulate how change is created and evaluate this through evidence gathered, recognising positive and negative changes as well as those that are intended and unintended.
3. **Value the things that matter** – Use financial proxies in order that the value of the outcomes can be recognised. Many outcomes are not traded in markets and as a result their value is not recognised.
4. **Only include what is material** – Determine what information and evidence must be included to give a true and fair picture to draw conclusions about impact.
5. **Do not over claim** – Only claim the value that organisations are responsible for creating.
6. **Be transparent** – Demonstrate the basis on which the analysis may be considered accurate and honest, and show that it will be reported to and discussed with stakeholders.
7. **Verify the result** – Ensure appropriate independent verification of the account.

STAGES

1. **Establishing scope and analysing stakeholders.** Define clear boundaries about what the SROI analysis will cover, who will be involved in the process and how.
2. **Mapping outcomes** – Through engagement with stakeholders develop an impact map (theory of change) which shows the relationship between inputs (resources), outputs (activities) and outcomes (results of activities).
3. **Evidencing outcomes and giving them a value** – Finding data to show whether outcomes have happened and then valuing them.
4. **Establishing Impact** – Having collected evident on outcomes and monetised them, those aspects of change that would have happened anyway or are a result of other factors are eliminated from consideration.
5. **Calculating the SROI** – Adding up all the benefits, subtracting the negatives and comparing the result to the investment (SROI ratio). Express financial figures in terms of net present value, and to conduct a sensitivity analysis.
6. **Reporting, using and embedding** – Sharing findings with stakeholders and responding to them, embedding good outcome processes and verification of the report.

Source: Adapted from The SROI Network 2009 A guide to Social Return on Investment

Appendix 3

Social Return on Investment – Summary of Lessons Learned

Lessons Learned	SROI Analysis
Lessons Learned – Benefits	An SROI analyses benefits : 1. gives organisations deeper insight into the impact they are having on all their stakeholders, helping management to better understand and refine their theory of change 2. helps organisations increase their understanding of how and why they are having an impact, and better understand their processes and improve their strategic plans 3. motivate the operating team 4. provides a powerful snapshot of an organisation's impact (for benchmarking in planning and in future performance measurement) 5. informs of the true costs associated with delivering an organisation's social impact 6. provides a compelling story to investors, evidencing that their money is achieving social improvement. 7. quantifies and monetises social impact
Lessons Learned – Limitations	SROI analysis limitations : 1. SROI approach is not a comprehensive evaluation framework but complements existing tools and methods. 2. Each SROI analysis is tailored to each organisation. The SROI ratio is specific for each organisation and does not lend itself to cross organisational comparison. (However, the SROI ratio as a benchmark within an organisation enables measurement changes in performance over time) 3. The numbers can be misinterpreted – specifically the SROI is about value, rather than money. The SROI ratio represents the social value created for each $1 invested rather than an actual financial return. 4. Lack of suitable data on past performance sufficient to inform an evaluative SROI analysis is a potential obstacle.
Lessons Learned - improvements	SROI improvements: 1. SROI is too limited in recognising only forecast and summative analyses – propose a Baseline SROI = conclusion about the SROI achieving now. 2. Extensive uptake of SROI is dependent on non-profit organisations and social enterprises giving appropriate priority to ongoing measurement.

Source: Adapted from Investing in Partnerships (IIP) 2012 Social Return on Investment: Lessons learned in Australia, prepared for Investing in Impact Partnership.

Appendix 4

SROI Case Studies – Employment creating social enterprises

ENTERPRISE	AIMS	KEY LESSONS	LIMITATIONS
Food Connect Brisbane Food distribution	To understand and value the impact on its stakeholders given its growth plans – Forecast SROI. (Funding agreement with investor)	The SROI process and analysis enabled FCB to objectively and independently validate the impact they created and intend to create.	Lack of understanding of what constitutes a "good result" made it difficult to compare with organisations or benchmarks. SROI was resource intensive due to limited data collected in the past.
STREAT Assists homeless & disadvantaged youth find long-term and meaningful employment.	Forecast SROI analysis to develop a measurement/evaluation framework to identify data to collect and the social, economic and environmental impact.	SROI analysis confirmed the value of STREAT's employment support approach and created baseline data for their measurement and evaluative framework.	It considered outcomes in isolation and did not fully capture their inter-connectedness. Due to the forecast nature it was difficult to engage with some stakeholders and they were excluded. SROI analysis did not represent the full potential impact.
People Power Cleaning (PPC) Provides employment to refugees and migrants at risk of mental health issues who face employment barriers.	To understand the costs associated with providing support to marginalised employees. (As part of a funding agreement with investor)	Identified the most significant support costs were training and on-job supervision. Provided a credible and transparent justification for funding an additional employee.	No limitations indicated.
Tasty Fresh Community Catering Provides support, training and job opportunities for underprivileged women.	Part of funding agreement with investor. To understand the costs associated with providing support to marginalised employees.	Identified the real costs associated with achieving the social mission, many of which had been underestimated and not accurately factored into forward projections.	The timing of the analysis was not ideal. The results would be more useful had the process been conducted when there was more clarity around forecast growth and revenue targets.

Source: Adapted from Investing in Partnerships (IIP) 2012, Social Return on Investment. Lessons Learned in Australia prepared for Investing in Impact Partnership.

Appendix 4 (cont'd)

SROI Case Studies – Employment creating social enterprises

ENTERPRISE	AIMS	KEY LESSONS	LIMITATIONS
Livingin Constructions Constructs affordable buildings /landscapes for families in need while employing people excluded from the labour market.	Part of investor funding agreement. To understand the additional costs incurred, and value created from employment. Provide management and investor with the range and value of outcomes and costs.	Stakeholder feedback was a critical component. Illustrated key driver of social value was through increased employee social interaction. Gained clarity on outcomes, values and costs. Informed what data to collect and evaluate in the future and how to reduce costs.	SROI analysis was useful but could have been more powerful if it incorporated all elements of their model i.e. both the universal housing design and employment support programs.
Sandgate Enterprise Economic Development Provides jobs for people excluded from the labour market.	Part of investor funding agreement. Learn about the methodologies, insights and improvements.	Significant social value was created for employees/ centre. SROI highly valued by management/corporate customers due to analysis integrity.	No limitations indicated.

Source: Adapted from Investing in Partnerships (IIP) 2012, Social Return on Investment. Lessons Learned in Australia prepared for Investing in Impact Partnership.

Appendix 5

Summary of results from Kirkpatrick/Phillips Levels of Evaluation ROI Model for Returns to investment of Workplace Literacy (Australia)

INDUSTRY (size)	DESCRIPTION	DATA COMPLETENESS & QUALITY	RETURNS/IMPACT
Aged Care (Small)	Improving documentation to enhance organisational culture	Monetised changes in supervisor time across all data collection points.	117.5% - savings through reduced documentation errors.
Aged Care (Medium)	Reducing turnover and improving employee engagement	Systems and data capture not ideal for this purpose.	Anecdotal and important part of orientation – improving documentation and maximising call on government funding.
Building and Construction (Large)	Supporting workforce engagement and worker advancement	Large, complex and multi-faceted program made data collection difficult.	Difficult to quantify across entire program – sub program identified $192,600 in savings.
Manufacturing (small)	Supporting Lean manufacturing and enhancing worker engagement	Data-driven culture. Uses multiple indicators to monitor change.	132% return from dual-program.
Manufacturing (medium)	Supporting workplace health and safety learning	Multi-layered program produced measurable sub-set of data	163% return from error reduction and saved supervision time.
Utilities (medium)	Supporting new technologies and improve workforce efficiency	ROI calculated based on unit improvements in service orders.	102% at one site based on efficiency improvements.

Source: Adapted from Brown, J, Taylor, M, McKenzie, P and Perkins, K 2015 Investing in Workforce Literacy Pays: Building Employer Commitment to Workplace Language, Literacy and Numeracy Programs. ACER.

Appendix 6

TVET costs, benefits and impact

Study (Year)	TVET Costs/Benefits and Impact
AWPA 2013 Literature review	Positive effects on business productivity and profitability. Higher returns where training is highly specific; accomplished quickly and related to new technology or processes. The industry of the business and quality of training may influence the outcomes.
CEDEFOP (2013) Literature review	Education benefits: Improved health, improved environment, reduced national crime and drug use, democratisation and human rights. Adaption to technological change. Produce higher skilled workforce. Initial TVET – better health, membership of organisations and job satisfaction. Non-market benefits of self-esteem, confidence and opportunities for advancement. Size of organisation, industry and type of training impact on the return.
Independent Economics (2013)	Costs to Individual: Tuition costs, foregone earning opportunities Benefits to Individual: Higher employability, productivity, pathways to further study and higher education Costs to Economy: Economic costs of taxes Benefits to Society: Productivity, more educated workforce, positive health benefits and improved social outcomes. Increased participation in the workforce.
Karmel and Nguyen (2006) Student Outcome Survey Australia	Previous educational school attainment, the qualification level being studied and whether full-time or part-time employment or not influences the wage benefit. Higher level TVET qualifications provide a better return.
Kennett 2013	General and specific training - General training offers employment mobility while highly specific training creates low staff turnover.
Long and Shah (2008) ABS 2005 Survey of Education & Training	Costs to Individual: Non completion costs Rates of return are higher for part-time study than full-time study, slightly higher for those whose highest level of schooling is Year 10 rather than Year 12.
Noonan et al 2010	Indirect costs to economy: Payroll tax rebates, work development programs, completions of bonuses of employers of apprentices. Benefits: Higher immediate employment outcomes and higher wages, longer term workforce participation, higher satisfaction levels

Appendix 6 (cont'd)

TVET costs, benefits and impact

Study (Year)	TVET Costs/Benefits and Impact
NVEAC 2011 Literature review	Education benefits: Increased social cohesion and inclusion, active citizenship, adapt to technological change. TVET Social benefits: new networks, improved social interactions, social capital, confidence and self-esteem, improved health and wellbeing and reduction in crime.
OECD (2008) Literature review	Demand for skills, labour market regulations, trade union influences and industry sector impact on the return.
Stanwick, Ong and Karmel (2006) HILDA Regressional analysis and interviews.	HILDA (Household Income and Labour Dynamics Australia) Benefits to individual: health and wellbeing - positive relationship with employment and income playing an important role that affects health. Interviews indicate social benefits of wellbeing, confidence, self-esteem and socialisation.
Watson (2005)	Course costs to individuals: Student fees & charges – course fees, student amenity levies, text books, library fines, transport, computer equipment, accommodation (living away) Opportunity costs: earnings forgone - full-time students more than part-time students Non-completion costs: No financial benefits from incomplete study.

Appendix 7

Employer training costs and benefits

TRAINING COSTS	TRAINING BENEFITS	
COSTS	**TANGIBLE BENEFITS**	**INTANGIBLE BENEFITS**
QUANTITATIVE	**QUANTITATIVE**	**QUALITATIVE**
Direct Training Costs for Employers 1. Cost of needs analysis/surveys 2. Course design, development or purchase 3. Salary of instructor and/or consultant 4. Salary of staff while training 5. Offsite travel, lodging and meals 6. Facilities rented or allocated 7. Equipment and hardware 8. Instructional and testing materials 9. Course/training evaluation 10. Other direct training cost for employers **Direct Trainings Costs for Individuals** 1. Tuition 2. Childcare 3. Books and materials 4. Equipment e.g. computer 5. Travel/parking 6. Special fees e.g. library 7. Loss of income **Intangible Training Costs** 1. Loss of productivity while trainees are attending training 2. Other employee time related to training e.g. manager time helping to apply training 3. Missed opportunity cost 4. Induction cost 5. Cost of replacing the employee while attending the course 6. Maintenance costs e.g. mail, transport, refreshments, record keeping, stationary 7. Higher wastage rates until the trainee is fully proficient 8. Recruitment of training staff or selection of training package 9. The risk that a more highly trained employee may then obtain another job 10. Other intangible training cost for employers Plus Government subsidy contribution	**Productivity and Efficiency** 1. Reduced supervision time (hrs, $) 2. Worker hours saved as more capable of independent work (hours, $) 3. Reduced help from co-workers (hrs, $) 4. Production costs per unit ($) 5. Increased output per unit ($) 6. Reduced downtime (hours, $) 7. Reduced stoppages, shutdowns/breakdowns (hrs, $) 8. Reduced response time (hrs, $) 9. Reduced overtime (hrs, $) 10. Fewer employees needed ($) 11. Broadening the range of workers tasks **Sales and profitability** 1. Increased sales ($) 2. Improved profitability ($) 3. Improved competitiveness ($) **Quality of products and services** 1. Reduced waste/scrap ($) 2. Fewer mistakes/errors ($ of reworking) 3. Reduced calls to helpline (time, $) 4. Reduced legal costs ($) 5. Reduced insurance costs ($) 6. Cost savings of project failure ($) **Customer service and satisfaction** 1. Improved customer satisfaction levels 2. Repeat business 3. New business from client referrals 4. Reduced no. of complaints/lost business **Occupational Health and Safety** 1. Improved safety record 2. Reduced employee use of dispensary 3. Reduced safety-rule violations **Organisational learning and development** 1. Increased no. of training programs 2. Increased no. of internal promotions **Organisational, climate, culture, practices** 1. Reduced employee turnover ($ cost savings of recruitment, orientation, induction, loss of corporate memory) 2. Reduced employee absenteeism 3. Reduced need for outsourcing ($) 4. Reduced employee grievances 5. Fewer disputes/strikes 6. Reduced discrimination charges 7. Improved understanding of markets 8. Increased number of pay increases 9. Number of requests for transfer 10. Improved performance-appraisal ratings 11. Implementation of new ideas 12. Number of employee suggestions 13. Improved other tangible benefits	**Employee - Skill gains and future plans** 1. Improvements in language, literacy and numeracy. 2. Improvements in technical skills 3. Participation in further education and training 4. Improved understanding of new technologies 5. More portable employee skills and job mobility 6. Improved prospects for advancement **Employee - Social and well-being** 1. Improved employee self-confidence/self-esteem. 2. Improved employee morale 3. Reduced employee stress 4. Improved employee motivation 5. Improved employee resilience 6. Improved employee trust 7. Improved physical and mental health **Employee - Workplace practices** 1. Improved employee pay and benefits 2. Greater employee job satisfaction 3. Better understanding of job requirements, work procedures and organisation 4. More participation in committees, working groups, staff rep roles etc. 5. Improved perceptions of job 6. Improved decisions made 7. More problems solved 8. Improved employee work ethic 9. Greater employee job security 10. More engaged with enterprise 11. Increased use by standardised tools, documentation, framework etc. **Enterprise and Management** 1. Supported successful completion of other project 2. Better management-employee workplace relations 3. More co-operation among employees 4. Fewer internal conflicts 5. Greater employee flexibility 6. Remediated workers inadequate pre-employment skill levels 7. Assisted with meeting changing skills requirements 8. Assists developing learning culture 9. Supports social inclusion/cohesion **Government and wider-community** 1. Reduced reliance on welfare 2. Increased tax base 3. Home life (e.g. parents reading to children, library services, job search 4. Improved other tangible benefits

Source: Adapted from Barker 2001 and Moy and McDonald 2001. In Brown, J, Taylor, M, McKenzie, P and Perkins, K, 2015 Investing in Workforce Literacy Pays. Building Employer Commitment to Workplace Language Literacy and Numeracy Programs, ACER.

Appendix 8

List of factors and processes that may impact on ROI results in the workplace

INDIVIDUAL	WORKPLACE TRAINING PROCESS	WORKPLACE FACTORS	OTHER INFLUENCES
1. Demographics 2. Life course circumstances 3. Employment characteristics 4. Participant activity limitations/baseline health 5. Initial cognitive skills 6. Initial non-cognitive skills 7. Prior educational experiences 8. Participant in other programs e.g. technical, vocational reskilling, ICT etc.	1. Type of skills training 2. Purpose 3. Business alignment 4. Match to learner needs and goals 5. Design - Contextualised training content/curriculum 6. Design - Assessment and evaluation 7. Delivery - Teaching style 8. Delivery – Flexible or customised delivery model 9. Duration 10. Intensity 11. Timing of instruction 12. Instructor's teaching ability 13. Class size 14. Contact hours 15. Training take-up 16. Completion of training activity 17. Participant – reaction to training 18. Participant – engagement to learning 19. Participant – awareness and intentionality	1. Employer awareness and expectations 2. Employer support for program 3. Coaching and reinforcement 4. Workplace culture 5. Access to resources and support 6. Opportunities 7. Work processes 8. Incentive structures 9. Clarity of roles and expectations 10. Financial health of organisation 11. Implementation of new processes/technologies/ policies 12. Restructuring and organisational change	1. Public policy and programs 2. Socio-economic conditions 3. Market conditions (customers, competition and demand) 4. Research and innovation 5. External knowledge, partnerships and networks

Source: Adapted from Measures of Success Research Framework 2011. Human Resources and Skills Development Canada (In Brown, J, Taylor, M, McKenzie, P and Perkins, K, 2015 Investing in Workforce Literacy Pays: Building Employer Commitment to Workplace Language, Literacy and Numeracy Programs, ACER)

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