

A framework to better measure the return on investment from TVET

A UNESCO–UNEVOC and NCVER research project initiative

Jane Schueler
TeaHQ

John Stanwick and Phil Loveder
National Centre for Vocational Education Research



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Level 5, 60 Light Square, Adelaide SA 5000

PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

Phone +61 8 8230 8400 Email ncver@ncver.edu.au

Web <<https://www.ncver.edu.au>> <<http://www.lsay.edu.au>>

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About the research

This report is the result of a research project initiative of NCVER and the UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training (TVET) in Bonn (Germany). The initiative aimed to facilitate research collaboration in the UNEVOC Network towards development of tools that can help improve TVET funding mechanisms through evidence-based research and strengthen capacities in this area.

This report presents a conceptual framework for understanding the return on investment (ROI) equation in TVET from different stakeholder perspectives.

The framework uses three main stakeholder groupings - individuals, business and the economy. Although the framework separates these three perspectives, they are not independent of each other. There are flow-on effects. To provide a complete ROI picture both economic and social impact dimensions are featured. Understanding the interaction between the economic and social benefits is important in assessing the true and full value of TVET. The key indicators were selected on the basis of their usefulness, practicality and capacity to value-add along with the ability to apply to different types of training and contexts.

Key messages

The authors highlight the following key observations:

- The key types of ROI for individuals arising from TVET are primarily employment and productivity supporting higher wages. Attainment of employability skills and improved labour force status are also highly valued job-related returns. Non job-related indicators focus on well-being such as self-esteem and confidence, foundation skill gains, along with social inclusion and improved socio-economic status.
- The key indicators of ROI for employers arising from TVET cover employee productivity, business profitability, improving quality of products and services and business innovation. Businesses operate similar to small communities and as such generate social and environmental benefits. In particular employee well-being, employee engagement (which reduces absenteeism and staff turnover), a safe workplace and environmental sustainability practices are key non-market indicators of business returns.
- The key indicator of ROI in the economy from TVET is economic growth. This relates to labour market participation, reduced unemployment rates and a more skilled workforce. TVET returns to education and training, bring other benefits to society, including improved health, social cohesion (increased democratisation and human rights), and improved social equity particularly for disadvantaged groups and strengthens social capital.

The report recognises that analyses of ROI in TVET can result in highly variable estimates; and that it is particularly difficult to untangle the financial and non-financial benefits of training. Further, the ready availability of data to populate such a framework is a challenge for it to gain greater practical value and allow estimates of ROI across economies.

Craig Fowler
Managing Director, NCVER

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Introduction

Technical and Vocational Education and Training (TVET) is seen as an important strategy in contributing to equitable, inclusive and sustainable economies and societies. The United Nations (2015) lists one of its sustainable development goals as to ‘ensure inclusive and equitable quality education and promote lifelong learning opportunities for all’. However, this comes with challenges for the funding and financing of TVET systems internationally and also for providing evidence for the return on investment (ROI) in TVET.

Providing information on ROI in TVET is important as it provides governments and funders of the system with analytical information on the performance of the system and further provides justification for the expenditure on TVET. Information on ROI is also useful at the level of the enterprise and the individual. However, the measurement of ROI is not straightforward and thinking through what is involved in the ROI calculation can give a better understanding as to what type of information and data is required to calculate the measure. This may also vary depending on the context of the country’s TVET system.

Hence, this report presents a conceptual framework for measuring ROI in TVET that can be tested in international contexts. It builds on previous work done as part of a larger collaborative project by UNESCO-UNEVOC in association with the National Centre for Vocational Education Research (NCVER) in Australia, and other UNEVOC Centres in the Asia-Pacific region.

The aim of the collaborative project is to investigate measurement of ROI across different contexts including across varying countries. The longer-term aim of the ROI project is to equip organisations in various countries to be able to systematically investigate evidence of ROI in TVET and to engage a range of stakeholders in this process. Part of this is the development and testing of a suitable ROI framework that can be applied internationally. There may well be variations between countries in terms of priorities regarding the costs and benefits of TVET. There will almost certainly be variations in terms of the data that is available to measure ROI in TVET.

This report firstly summarises some of the main issues that need to be thought through in measuring ROI. It then introduces an analytical framework that looks at the ROI equation from a range of perspectives, including economic and social and for different stakeholders; including individuals, businesses, governments and societies.

Definitions

For the purposes of this report:

Return on investment or *ROI* refers to a measure of the benefit of an investment relative to the cost of that investment. So in the TVET context, ROI is the benefits derived by individuals, firms and nations from investing in training (VET Glossary 2016).

Returns to education refer to the individual gain from investing in more education, especially focussed on the relationship between education attainment and earnings. However, for consistency and simplicity, this report tends to use the terminology of Return on Investment or ROI.

Technical and Vocational Education and Training or *TVET* comprises education, training and skills development for a wide range of occupations. It can take place in secondary school and tertiary education and includes work-based learning and continuing education and training.

Types of returns

A comprehensive study by Griffin (2016) explored the existing international literature around the ROI from different perspectives and stakeholder groups.

Broadly, at the economic level, research on the ROI in TVET falls into two broad categories:

- determining the ROI for spending that has occurred
- investigating the potential return should spending/funding be altered.

Both of these approaches have demonstrated the value of TVET to the economy through increases in employability and, to a lesser degree, increases in productivity.

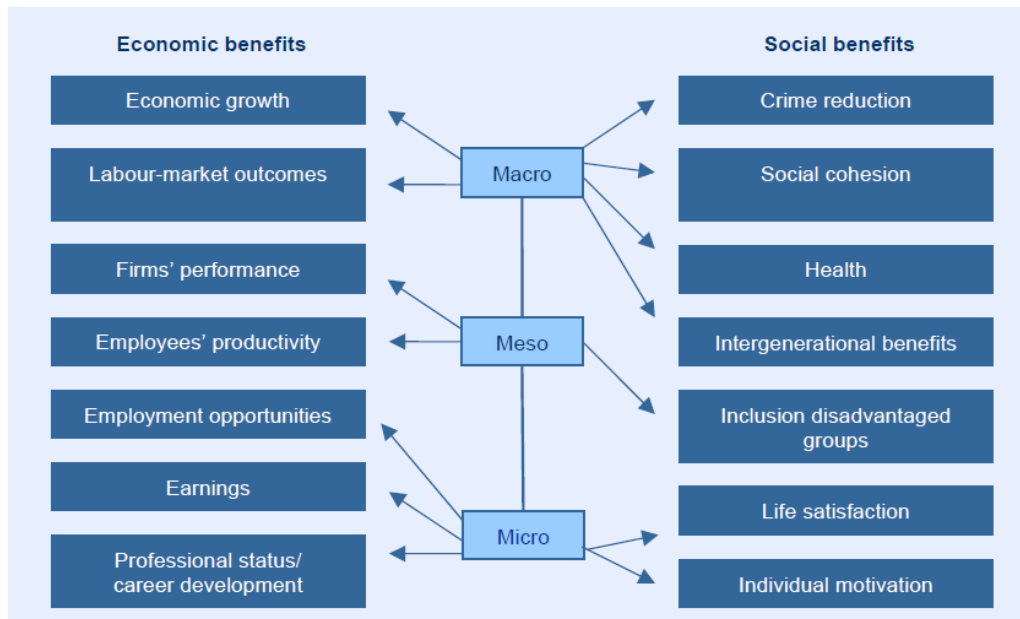
A summary of the types of returns include:

- For the individual, higher-level VET qualifications are consistently demonstrated to provide a good return on investment. The individual returns from TVET are mostly generated through increased participation in the workforce. Lower-level qualifications consistently resulted in lower financial returns, although these qualifications may result in other benefits, such as further study or improved self-esteem and wellbeing.
- For individual businesses, analyses of ROI in training result in highly variable estimates. This may be because the methods used appear to be more suited to industries where increases in productivity are easier to define and measure (such as in manufacturing, where some very high returns were reported, compared with service-based industries). It is particularly difficult to untangle the financial and non-financial benefits of training to business, as many improvements, such as reduced staff turnover, absenteeism, and positive changes to workplace culture, may also result in economic pay-offs for the business.
- For societies, in addition to productivity gains, education and training has also been shown to bring other, non-financial benefits to society such as improved health and reduced national crime and drug use, greater social cohesion and the potential for poverty reduction.

In support of this research, the benefits of training can also be grouped and illustrated in various ways.

The European Centre for the Development of Vocational Training (CEDEFOP) (2011) considers the benefits of TVET across two dimensions; economic and social. These two dimensions are then further grouped by three levels; micro, meso (or intermediate) and macro with the micro level approximately according with the level of the individual and the macro level with the level of the country (figure 1). Thinking about these benefits and which ones are most important in the context of a particular country's TVET system assists in considering how these benefits can be most effectively measured.

Figure 1 The benefits of vocational education and training.



Source: CEDEFOP 2011, *Research paper 10: The benefits of vocational education and training*, Publications Office of the European Union, Luxembourg.



Background on measuring ROI in TVET

Previous work (Griffin 2016; Schueler 2016) indicates that measuring ROI in TVET is a very complex matter. Firstly, there are different dimensions of outcomes of TVET to consider. For instance, Marope, Chakroun and Holmes (2015) in summarising arguments for investment in TVET across countries consider three arguments for the investment in TVET. These are economic growth, social equity and sustainability. Within different countries one or more of these arguments may be emphasised to a greater or lesser extent and this will naturally have an influence on which measures of ROI they should focus on.

Following on from this context is very important. The political, economic and education system of a country, and the stakeholders involved all have influence on which aspects of ROI in TVET are important. This means that what is measured in one country in terms of ROI might not necessarily be exactly the same as in another country, although there may well be some common baseline as to what is measured.

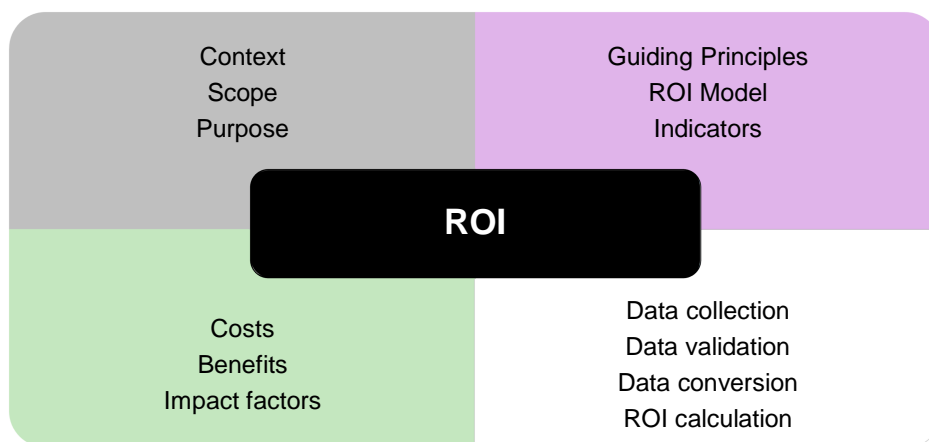
Another complexity is the availability of data to measure TVET. Data that exists may not necessarily be in a form that is readily useful for the measurement of ROI, or more pointedly, may not exist at all. Participants in a virtual conference on ROI run by UNESCO (UNESCO-UNEVOC 2016) noted several aspects to the challenge of having data for ROI. These include having ROI in mind when setting up data collection for TVET, coordinating stakeholders that may provide data, setting up appropriate Management Information Systems, and broader approaches to the collection of data (for example, qualitative data if need be).

Given the above considerations and before arriving at an evaluative framework for ROI in TVET, a number of issues need to be thought through. This background explores these issues and is based largely on Schueler (2016).

Issues in developing the ROI evaluation framework

The key elements constituting an evaluation framework based on a review of the literature are shown in figure 2. The various quadrants in the framework are discussed below.

Figure 2 ROI Evaluation Framework elements



Context, scope and purpose

The context, scope and purpose form the foundation of the framework. Developing a return on investment (ROI) evaluative framework requires understanding the TVET context. Furthermore, 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.

In terms of scope, there are multiple levels of stakeholders including individuals, enterprises and economies. Within each of these different levels of stakeholders are multiple dimensions of ROI. These include the economic, social and environmental measures of 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).

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 (Brown et al. 2015) and as part of funding agreements (IPP 2012).

Guiding principles, models and indicators

Developing guiding principles

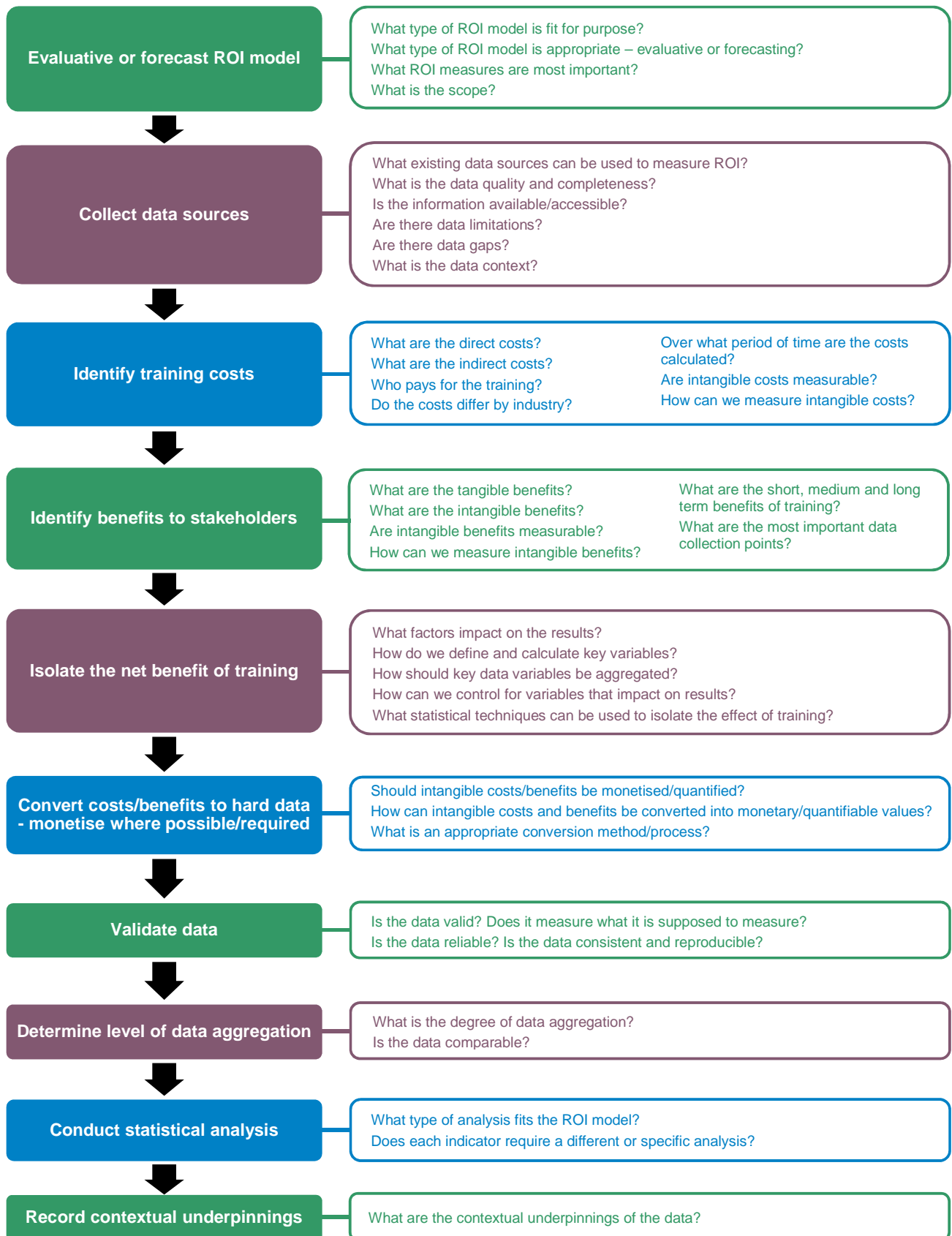
The guiding principles ensure that a consistent and standard frame of judgement is applied to the ROI evaluation. The guiding principles consider the following:

- The ROI model or method to be adopted. This must be customised, fit for purpose and add value. It requires an overarching clarity of purpose. The model should measure factors that are specific and relevant to the context.
- The implementation of the ROI model. There are a few issues to consider here such as whether it is practical and will provide information that meets the needs of stakeholders. The model also needs to cater for a range of measures and data sources, a variety of training types, and whether it can be applied before, during and after training.
- The development of the methodology and data collection instruments processes and instructions. This includes ensuring that the data collection instruments are capable of being customised to particular context while being specific enough about the data that is required. In addition, they should place minimal load on the stakeholders that need to administer them.
- The compilation of credible evidence about the impact of training. Firstly, the data has to be of sufficient quality. The ensuing analysis then should be scientifically valid and address the fact that training may not be the only factor that explains changes in performance or outcomes.

Approaches to measuring ROI

The rest of the information, divided into quadrants in the evaluative framework, can be usefully represented by a flowchart or 'decision tree'. Figure 3 presents this process of measuring ROI within the evaluative context. The various components of this flowchart are discussed in the sections that follow.

Figure 3 Measuring ROI process



Models of ROI

TVET research studies use various models to determine ROI. These models include measuring economic and social impact (SROI). Some examples of ROI models are shown in table 1. Different models apply to different situations and 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.

Table 1 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 4 th 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: Derived from several sources and studies.

Some examples of specific studies of ROI that have been conducted are shown in table 2. Most of these examples appear in reviews of the links between education and training and its benefits by Griffin (2016) and the Australian Workforce and Productivity Agency (2013). There are studies in the table that look at returns from the perspective of the economy, firms and individuals. The table provides indications of the data that was used, the econometric or otherwise quantitative models applied and the main results from the analysis for each of the examples.

Table 2 Examples of studies investigating the return on investment of training to the economy, firms and the individual

Study	Methodology used	Findings
<i>Two studies investigating the return on investment of training to the economy</i>		
Canton 2007 (cross-country)	Analysis used a macro-version of the Mincer relationship between education and wages at the individual level. Data source was estimates of school attainment by Cohen & Soto (2001) for 95 countries split by 5 year age groups in 10 year intervals.	An increase of one year of average education level of the labour force increases labour productivity by 7–10% in the short term and 11–15% in the longer term. There was also some evidence of spillovers in the sense of the human capital stock increasing prospective economic growth.
Independent Economics 2013 (Australia)	Cost-benefit analysis to estimate the return of increased funding in VET.	The committed 5.6% increase in funding was predicted to result in an 18% internal rate of return to the economy.
<i>Three studies that aimed to investigate methods to assess the relationship between training and productivity</i>		
Blandy et al. 2000 (Australia)	Surveys (based on larger international examples) and a small number of in-depth case studies.	10% increase in training resulted in a 1% increase in productivity growth. Training quantity and quality were positively associated with profitability.
Dearden, Reed and Van Reenen 2005 (UK)	Analysis of constructed panel study of firms using the econometric estimation technique General Method of Moments (GMM).	They found that a 1% increase in training in firms resulted in about a 0.6% increase in productivity; double the 0.3% increase in wages.

Bernier and Cousineau 2010 (Canada)	Analysis of the longitudinal Statistics Canada Workplace and Employee Survey (WES) using a Cobb-Douglas function within a distributed lag estimation framework.	There are positive effects of training on productivity spread out over a three year period. In addition, they found interactions between investments in capital and investments in training. A 10% increase in investments accompanied by expenditure in structured training per employee resulted in an average increase of 0.6% in corporate productivity the following year compared to a company that did not invest in capital complementary to training.
<i>Four studies that aimed to investigate methods to assess the relationship between training and the individual level</i>		
Green and McIntosh 2006 (UK)	Uses wage equations at the individual level and productivity equations at the industry level. Data used was from the Labour Force Survey in the UK from 1996–2005 (including the National Adult Learning Survey as a supplement to the LFS in 2003) and comparative data from <i>Eurostat</i> for other European countries to examine non-certified learning.	Individuals who undertake non-certified learning earn about 5–6% more in wages than those who do not. No significant relationship was found between rate of non-certified learning and productivity for industries. It is the undertaking of the non-certified learning that is important; not the period of learning.
CEDEFOP 2011d (cross-country)	The study used a variety of comparable data sets from across the EU. Multi-regression analysis techniques were used to examine the effect of vocational education and training on wages and employment status.	The returns for an extra year of tertiary and equal to the return of one extra year of initial VET. Education on wages and employment are about 7% for both males and females. Adjusted returns to account for the short duration of the training (17 weeks on average) gives yearly returns for VET of 10% for men and 7% for women.
Chesters, Ryan and Sinning 2013 (Australia)	The research used the Survey of Aspects of Literacy (SAL) and the Adult Literacy and Life Skills (ALLS) survey to investigate the income returns of literacy skills in the Australian Labour market. Analysis uses a modified standard human capital earnings function that adds literacy skills as a determinant of earnings.	There is a positive association with income for observed literacy skills and educational qualifications for full-time male and female employees. Income was found to increase with literacy skill level within defined broad education levels. There are higher returns to literacy skills for highly educated workers as opposed to workers with lower levels of education. However, for those workers with lower to medium education, the returns to literacy skills have increased over time for some cohorts.
Polidano and Ryan 2016 (Australia)	The research used the HILDA longitudinal dataset to examine the long-run effects of completing VET. Fixed effects regression methods were used to estimate long-run effects of obtaining new qualifications, and also obtaining further qualifications at the same, higher or lower level than the previous qualification.	The effects (for example labour market outcomes) of obtaining a VET qualification are often larger for females than for males. The longitudinal data showed stability of effects over time with significant effects found in the first year after course completion remaining up to five years later. Further completed qualifications not higher than the previous qualification did not consistently result in better labour market outcomes in this study.

Dimensions of ROI

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
<i>Job related</i>	<i>Market</i>	<i>Economic</i>
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	Gross domestic product (GDP)
Training pathways – vocational/higher education.	Business innovation	
<i>Non-job-related</i>	<i>Non market</i>	<i>Social</i>
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: Derived from several sources and studies.

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 gains unrelated to jobs 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.

Data collection

There are two main steps within the actual data collection process. The first is preparing information to guide the process. This includes, for example, developing data collection instruments and supporting documentation, defining data elements to be collected, and identifying possible data sources in supporting instructions and documentation.

The second step is establishing existing data sources. This includes identifying types of quantitative and qualitative data sets such as national data collections, administrative datasets, longitudinal studies, surveys, interviews and case studies. Of further importance is determining and documenting the completeness of the data, its quality, gaps in the data, where the data will be collected, and the conceptual underpinnings of the data.

Once the data has been collected it may need to be converted into monetary terms. Not all the data that is collected will necessarily be in monetary form; particularly the less tangible costs and benefits. Therefore consideration needs to be given as to how the data can be converted to monetary or quantifiable values (if possible/required) and what is an appropriate conversion method and process.

The data will also require validation before statistical analysis for ROI is conducted. That is, the data being used in the ROI calculation should measure what it is supposed to be measuring. Furthermore, the data needs to be reliable in terms of being reproducible, consistent and accurate. Then an analysis for return on investment can take place using an appropriate statistical approach. For example, regression or multivariate analysis has been applied to ROI data to control for variables to ensure the ROI outcome is a direct result of training.

Costs and benefits

The costs and corresponding benefits of TVET are critical to ROI. Related to this is a consideration of how these can be impacted by other factors, for example, the state of the labour market.

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 type and attributes of the specific training program. TVET costs are paid by students, businesses, industry, training providers and the community, for which 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
<i>Direct costs</i>	<i>Direct costs</i>	In addition to public expenditure
Tuition	Course costs for employee	
Books and materials	Salary of staff while on training	
Equipment (for example, computer)	Course design and development	
Childcare		
Travel/parking		
Special fees (for example, library)		
Opportunity costs	<i>Intangible costs</i>	<i>Indirect costs</i>
Foregone or reduced earnings while studying	Loss of productivity while trainees are attending course	Payroll tax rebates
	Induction costs	Workforce development programs
Non-completion costs	Costs of replacing employee while attending course	Completion bonuses of employers of apprentices
	Higher wastage rates until the trainee is fully proficient	
	Missed opportunity costs	

Note: Derived from several sources and studies.

Direct costs are more easily measurable. For individuals these expenses can vary. Financial costs may differ between courses, providers and with concession (Watson 2011) 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.

Training benefits

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 & Shah 2008), and for the economy, increased participation in the workforce. Training ‘pay-off’ to individuals also varies depending upon whether the training can be considered preparatory (such as initial VET) or higher-level (Karmel & Fieger 2012).

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
<i>Job related</i>	<i>Market</i>	<i>Tangible benefits</i>
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)		
<i>Non-job-related</i>	<i>Non-market</i>	<i>Intangible benefits</i>
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: Derived from several sources and studies.

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.
Intangible	Improved workplace practices and procedures.	Improved Occupational Health and Safety
	<i>Social and well-being:</i>	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.

The benefits may arise at different points in time and may extend well beyond the completion of the training. The estimation of ROI can relate to a time period during a training program, at its completion or long after the event (OECD 2008).

Table 7 shows a comparison of the short and long term benefits of training 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).

Table 7 Short-term and long-term benefits of training by stakeholder

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

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

Other factors impacting on ROI

There are a range of factors that can influence ROI apart from costs and benefits. 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 (for example, 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.

In particular, there are specific factors that impact on ROI for each stakeholder group. These are educational background and qualification level of the training program for individuals; industry type, organisation size and profit/not-for profit sector type for enterprises and the profile characteristics of

the population for the economy. Of particular note for all stakeholder groups is the type of training program and the field of education or industry and the impact on ROI.

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 versus accredited training Training level – for example, foundational – literacy & learning Industry/field of study Types of training – leadership, management, innovation, apprenticeship Initial TVET or on-going training. (for example, 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 versus classroom training Training in partnership versus 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).

Issues with data collection

Any ROI model must be supported by useful and practical indicators. However, there are various considerations regarding data for ROI measures. This is in addition to initially establishing the availability of data as discussed earlier.

One consideration is the integrity and credibility of the data. This refers to the level of data accuracy, validity (is it measuring what it is supposed to measure) and reliability (is it consistent and reproducible). There is also a need to recognise that the data validity and reliability may vary with the level of data aggregation.

Another consideration is data comparability. In order to compare data there needs to be consistent definitions across data sets and the need to establish the basis for data comparisons. This includes establishing which data is directly comparable and which is not.

The data also needs to be transparent. This means that its conceptual underpinnings are carefully explained. In addition, a description of data quality and completeness is necessary along with highlighting any gaps or anomalies.

In summary, the measurement of ROI requires context, scope and purpose with guiding principles that form a standard frame of judgement and a practical ROI model that is customised, fit for purpose and measures what matters. It identifies relevant costs and benefits of TVET and how these can be impacted by other factors. It supports useful indicators, practical measures and quality data and then applies scientifically valid techniques which seek to address the influence of other variables.



The ROI analytical framework

This section outlines the main elements of an ROI evaluative framework.

Background

A review of the literature on ROI consistently indicates that ROI is context specific to the stakeholder and relative to the environment (OECD 2008). Furthermore, the differences between the area of focus, demographics and methodology add to the variable outcomes. Although the measurement of ROI is both diverse and complex, identifying key indicators to formulate a conceptual framework requires an overarching structure that supports a practical approach with broad application.

The ROI framework presented in this section is based on the extensive analysis of existing research approaches in this area. A discussion of the main features of the model aim to provide a comprehensive guide to the perspective, dimensions and objectives that underlie the framework along with the high-level indicators that direct attention to capturing measurable outcomes.

Stakeholder perspective

This ROI framework has three stakeholder perspectives – individual, business and the economy. In the literature these are the three main stakeholder groups that focus on ROI from TVET.

- There are many studies that focus on returns to the individual with a particular focus on the relationship of qualification levels with employment and wages. This area has been well researched and supported by extensive data (Karmel & Nguyen 2006; Leigh 2008; Noonan et al. 2010).
- The business tier covers employees, employers, individual businesses and industry. In this sector, training is highly specific for target groups and it is often through case studies that business outcomes are derived, although Bartel (2000) notes that large sample surveys of firms and econometric type case studies of one or two companies are also used. The return on investment maps across operations, profitability, product/services and human resources.
- At the macro level, the impact of TVET on the economy has been studied through economic modelling and other predictive approaches to measure economic growth (Independent Economics 2013). Analysis of varying population profiles also provides insight into social returns.

Although the framework separates these three perspectives, they are not independent of each other. The dynamic relationship between stakeholder groups can have flow-on effects.

Economic and social dimensions

To provide a complete return on investment picture, both economic and social impact dimensions are featured in the framework.

The majority of studies focus on economic returns to stakeholders. These include financial returns to individuals in the labour market (Karmel & Fieger 2012; Long & Shah 2008), productivity and profitability to business (Cedefop 2013) and economic growth indicators (Independent Economics 2013). However the literature (Stanwick et al. 2006; Cedefop 2011a; IIP 2012) also points to a great interest in the social outcomes of TVET which are not always so easy to measure as economic

markers. More recently, the health and well-being of individuals, employees and society is capturing the attention of ROI research.

For the purposes of this framework, economic indicators relate to job-related outcomes for individuals, and market indicators for business and economic growth for the economy. Social indicators refer to non-job-related outcomes for individuals, and non-market indicators for business, for example, employee engagement and social returns of health and well-being in society.

Most importantly, understanding the interaction between the economic and social benefits is vital in assessing the true and full value of TVET. The dynamics of social returns to directly impact economic drivers is of notable interest.

Environmental impact is also of primary importance to this discussion across stakeholder groups. However, for the purposes of this framework, this measure has been included within the business sector tier relating to environmental sustainability and work practices.

TVET economic and social objectives around ROI

To develop a foundation for the ROI framework, there is a main ROI objective for each stakeholder group. Table 9 summarises how TVET contributes to the economic and social outcomes of stakeholder groups which form the focus of the ROI framework.

Table 9 TVET contribution to economic and social outcomes by stakeholders

Stakeholder	Economic	Social
Individual	TVET provides the skills required to participate in the labour market.	TVET contributes to improved social outcomes for individuals.
Business	TVET meets the needs of business/industry outcomes.	TVET contributes to a healthy, safe and sustainable workplace environment.
Economy/society	TVET contributes to improved economic outcomes in the economy.	TVET contributes to improved social outcomes in society.

In terms of economic measures, TVET contributes to labour market skills, business outcomes and economic growth. TVET social outcomes relate to health and well-being for individuals, employees and society, as well as a safe, environmentally sustainable workplace.

Key ROI indicators

A review of the research literature on ROI (Griffin 2016) highlights indicators that relate to the three stakeholder groups – individuals, business and the economy – and measure the level of impact on economic and social outcomes. An overview of the high level ROI indicators are presented separately by stakeholder type, although as mentioned earlier in this section they can influence and interact across domains. The indicators that follow have been selected on the basis of their prominence in the literature, usefulness, practicality and capacity to add value to stakeholder groups along with the ability to apply to different types of training and contexts.

Individuals

The key economic indicators for individuals in TVET are categorised as job-related measures. This primarily focuses on the labour market and employment of those not in a job before training (Karmel & Nguyen 2006; Noonan et al. 2010) and productivity in the form of financial returns or higher wages (Leigh 2008; Lee & Coelli 2010). An improved employment status as a result of a higher skill level of

employment or promotion (Karmel & Fieger 2012) is also included as a valued indicator. The attainment of employability skills for those completing training is an effective measure to determine the level of non-technical skills and knowledge required to get a job and participate effectively in the workforce. Importantly, an entrepreneurship indicator is essential to capture the skills and knowledge gained from participation in entrepreneurial education.

The social return on investment for individuals focuses on non-job-related indicators. An improved sense of health and well-being in the form of self-esteem, confidence and life or work satisfaction feature prominently in a number of studies (Stanwick et al. 2006; Deloitte Access Economics 2011; Cedefop 2013). The attainment of foundation skills following training measures the level of language, literacy and numeracy skills and improves individual capacity (Brown et al. 2015). Improved socio-economic status reflects positive returns to employment status changes, household income or living standards and increased returns to social inclusion measures through participation in social groups or communities (Cedefop 2011c; Deloitte Access Economics 2011; Priest 2009).

Business

The business stakeholder group includes employers, employees, individual businesses and the industry sector. Although employers implement highly specific training aimed at targeted groups to meet specific business needs, there are several key economic measures in the form of market indicators that have been well researched. These cover productivity (Bernier & Cousineau 2010; Columbo & Stanca 2008; Zwick 2006, cited in AWPA 2013), profitability (Blandy et al. 2000; AWPA 2013), quality improvement of products and services and business innovation through introducing new technologies and work practices (Maglen et al. 2001; Helper et al. 2016).

Businesses operate similar to small communities and as such, generate social and environmental benefits. In particular, employee well-being factors of improved motivation, confidence or job satisfaction (Cedefop 2011b) can strengthen workforce and employee engagement (which reduces absenteeism and staff turnover) (Cedefop 2013; Kennett 2013) and increase social returns. A safer workplace and environmentally sustainable work practices, such as increased recycling and reduced waste, are key non-market indicators of business returns. It is important to note that non-market returns can impact market indicators and deliver economic payoffs. For example a high level of employee engagement may translate into lower absenteeism and increase business productivity.

Economy and society

Analysis of ROI at a macro level often employs economic modelling as a predictive tool (Australian Productivity Commission 2012; Independent Economics 2013). This often focuses on economic growth as a key indicator of TVET's impact on the economy as measured by gross domestic product (GDP). The level of labour market participation, reduced unemployment rates and a skilled workforce indicate other key measures. Entrepreneurial activity is yet another measure as it brings value, innovation and employment growth to the economy.

TVET ROI from education and training brings other benefits to society. Research indicates that indicators of improved health (Cedefop 2013), increased social cohesion (NVEAC 2011), improved social equity (Buddelmeyer et al. 2012) through increased access and participation of disadvantaged groups in TVET and strengthened social capital (Cedefop 2011a) through participation in networks provide reliable measures of social returns.

ROI and public policy

An additional dimension considered in the literature (but less frequently considered in ROI calculations) is the extent to which ROI plays a role in the evaluation of public policies related to TVET. However, as pointed out by the European Training Federation (ETF 2008) increasing budgetary constraints in the delivery of public services (including education and training) means that expenditure must be more strongly defended and justified and the beneficiaries need to be more accurately targeted. Returns to public policy or program interventions are often reported in terms of cost-effectiveness or relate to the impact of a program to its overall costs. However, there are frequently multiple forms of return which interest policy makers including social effectiveness, strategic effectiveness and credibility which lend it to impact assessment using a mix of qualitative and quantitative approaches (Stufflebeam et al. 2000).

A practical example is the United Nations Development Program (UNDP) which has established indicators around four key policy objectives of TVET:

- *Participation* – considered here as social partners and stakeholders participating in decision making.
- *Accountability* – transparency and governance.
- *Decentralisation* – autonomy in decision making and innovation of the training system.
- *Effectiveness and efficiency* – system outcomes as they apply to labour market needs (Homs 2007).

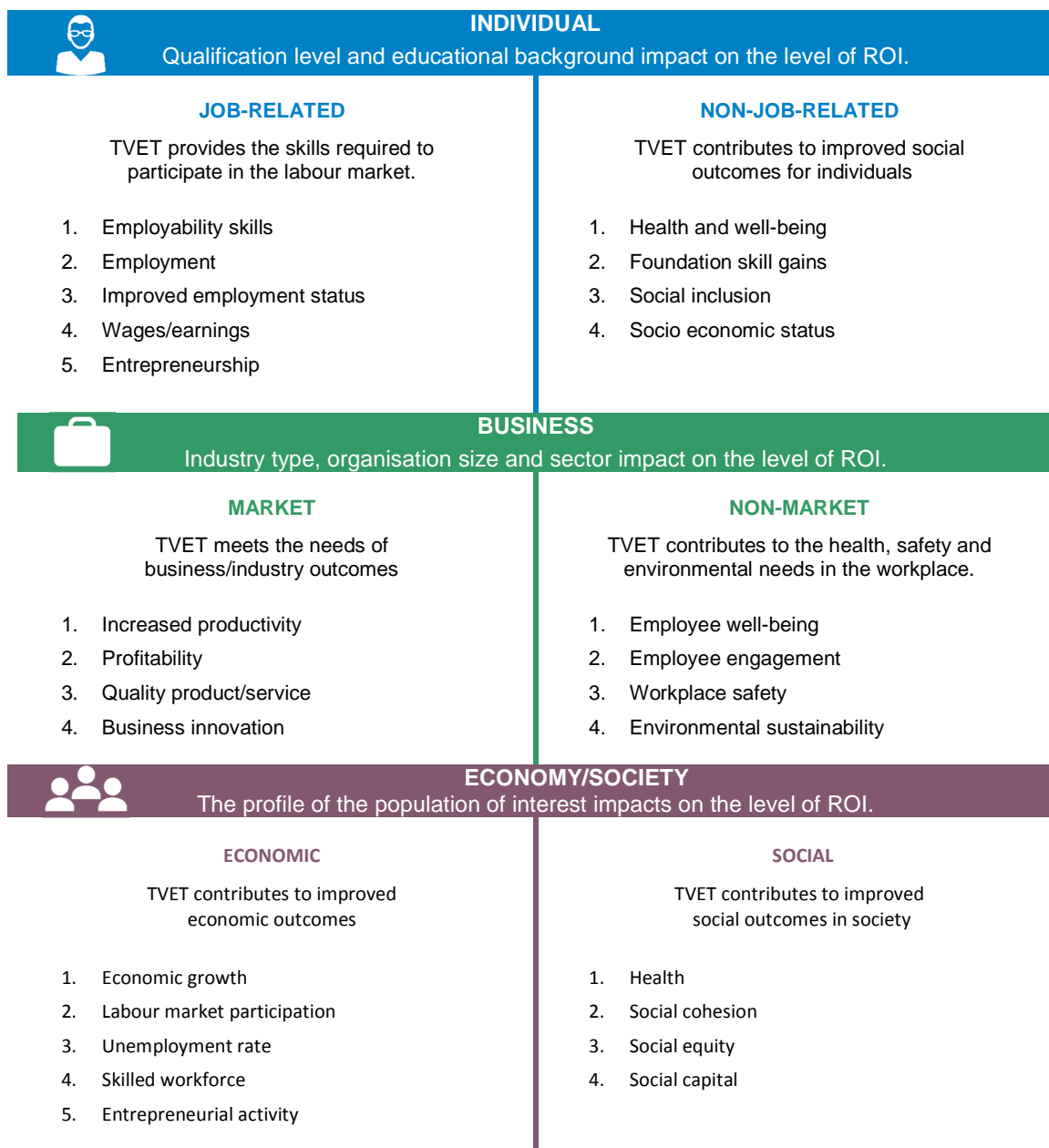
ROI framework

Figure 4 presents a diagram of the return on investment (ROI) framework for each stakeholder group and the economic and social indicators. The TVET ROI objectives also feature on the table. Following the ROI framework is a detailed description of the key ROI indicators and measures which are shown in the following tables:

- ROI indicators and measures for Individuals
- ROI Indicators and measures for Business
- ROI Indicators and measures for Economy/Society.

The figure also provides a list of example measures developed from analysis of existing studies.

Figure 4: Return on investment (ROI) framework



ROI indicators and measures for individuals

Indicator	Measure	Example measures
JOB-RELATED		
1. Employability skills	Attainment of employability skills for those who have completed training.	Attainment of the non-technical skills and knowledge required to get a job and participate effectively in the workforce. These include communication, self-management, planning, teamwork, decision making and problem solving skills.
2. Employment	Employment rate of those not employed before training.	Proportion of TVET graduates who are employed at the end of their training.
3. Improved employment status	Improved employment status of those employed before training who have completed training.	Proportion of TVET graduates who report improved employment circumstances. For example casual to permanent status, part-time to full-time status or promoted to a higher level of employment.
4. Wages/Earnings	Income of full-time workers after training.	Earnings of those employed full-time after training. As measured by gross net earnings, gross monthly earnings, weekly earnings, pre-tax hourly wages or annual earnings.
5. Entrepreneurship	Attainment of entrepreneurial skills and knowledge.	Attainment of skills, knowledge and attitudes that aim to build an entrepreneurial mindset and skillset required to transform ideas into action.
NON-JOB-RELATED		
1. Well-being	Students have an improved sense of well-being after training.	Improved self-esteem. Improved confidence. Life/work satisfaction. Self-rated health. Satisfaction with financial situation.
2. Foundation skill gains	TVET graduates/completers have improved foundation skills following training completion.	Attainment of language, literacy and numeracy skills and financial literacy.
3. Socio-economic status	Improved socio-economic status of those completing TVET programs.	Proportion of TVET graduates who report positive changes to employment status, household income, remoteness or living standards.
4. Social inclusion	Participation in social groups or communities.	Membership of a club or organisation, social network group, volunteering, sporting associations or other communities. Civic participation. Social interactions.

ROI indicators and measures for business

Indicator	Measure	Example measures
MARKET		
1. Increased productivity	Increase in the productivity of the organisation.	Value added per hour of labour, value of sales per labour hour, items sold per hour of labour. Management processes/work practices.
2. Profitability	Increase in the profitability of the organisation.	Reduction in costs. Increased sales. Reduced supervision time. Reduced scrap/wastage. Reduced induction costs.
3. Quality product/service	Improvement in the quality of products or services.	Customer service satisfaction. Reduction in error/defects rate.
4. Business innovation	Contributing to organisational innovation and business practices.	Introduction of new technologies. Best/new business practices. Increased efficiency and use of resources. Leadership/management practices/culture.
NON-MARKET		
1. Employee well-being	Employees have an improved sense of well-being.	Improved self-confidence. Improved motivation. Improved morale. Job/working conditions satisfaction. Reduced employee stress.
2. Employee engagement	Employees are more engaged in the workplace.	Skill gains – workplace language and literacy skills. Engaged in further study. Reduced absenteeism. Reduced staff turnover. Increased retention rates.
3. Workplace safety	Employees experience a safer workplace environment.	Reduced injuries. Decreased accidents. Improved safety records. Meeting compliance regulations. Meeting licensing requirements.
4. Environmental sustainability	Workplace practices contribute to environmental sustainability.	Improved energy and fuel management. Efficient waste management. Increased recycling of materials. Reduced energy and water usage.

ROI indicators and measures for the economy

Indicator	Measure	Example measures
ECONOMY		
1. Economic growth	Increase in the capacity of the economy to produce goods and services.	Gross domestic product (GDP) Real GDP (labour productivity)
2. Labour market participation	Increase in the labour market participation of TVET graduates/completers.	Labour market participation of TVET graduates.
3. Unemployment rates	Decrease in the rate of unemployment for TVET graduates/completers.	Unemployment rate of TVET graduates.
4. Skilled workforce	Level of educational attainment of TVET graduates/completers.	Qualification levels of TVET graduates who complete training by industry group. Productivity level. Higher earnings. Skill types by industry groups.
5. Entrepreneurial activity	Level of entrepreneurial activity of TVET graduates/completers.	Business start-up rates. Job creation/employment growth Social enterprise/community development Technological innovation/commercialisation Enterprise size/growth rate
SOCIETY		
1. Health	Improve community health and foster a longer and better life.	Self-rated health. Reduction of chronic health conditions, body mass index. Mortality/death rates.
2. Social cohesion	Improve the well-being, social inclusion and values that support co-operation within or among groups.	Reducing disparity and avoiding marginalisation. Crime reduction. Civic unrest status. Freedom status (political rights, civic liberties).
3. Social equity	Increase access and participation of disadvantaged groups in TVET.	Participation rate of disadvantaged groups in TVET including those with low socio economic status, disability, location remoteness, cultural/language barriers.
4. Social capital	Participation in networks that strengthen social capital.	Number and types of social networks. Active citizenship, civic engagement, volunteering or member of social network. For example participation/member of clubs, neighbourhood groups, organisations, political parties.

Guidelines to ROI data collection

What are the considerations of implementing the ROI framework to collect data? To implement the ROI framework and collect data requires defining underlying principles, identifying data sources and establishing data quality and availability. Listed are a few guidelines to support an initial ROI data collection process.

Principles

As a first step to collect data based on the ROI framework and indicators, there are a number of underlying principles to guide this process.

1. The key indicators are designed so they are sufficiently specific but general enough to apply across training contexts and environments.
2. The focus is on identifying existing data sources that relate to the ROI indicators.
3. The approach is to adopt transparency and clearly identify factors that may impact on the type and quality of data and acknowledge the potential impact.
4. Definition of the contextual underpinnings of the data and stakeholder groups is fundamental to understanding the ROI landscape.

Data sources and profiles

The steps to establish relevant data sources:

1. Identify the existing data sources that relate to the key ROI indicators and stakeholder groups including financial ROI data.
2. Define the type of data source – for example, administrative dataset, international collection, case study, longitudinal survey.
3. Document a description of the data including the year and source.
4. Define the scope of the data or profile of the population.
5. Identify the key data elements – for example, stakeholder demographics, training program, field of education.
6. Record factors that impact on the result and acknowledge the potential impact (refer table 8).

Data quality and access

To establish the data quality and an accurate interpretation of the data a number of steps need to be considered.

1. Define the data quality and completeness of the dataset.
2. Establish the availability of the data and the level of accessibility.
3. Identify any data limitations.
4. Record the information gaps or data gaps by stakeholder group and ROI indicators.
5. Explain any anomalies in the data.

In summary, to establish an accurate picture of the existing data source requires defining the contextual underpinnings of the data source, establishing the data quality and completeness, identifying the data gaps and highlighting any data limitations.

Conclusions

Information on return on investment to training is generally viewed as a valuable tool in arguing the case for funding (or additional funding) of TVET systems and programs. Examination of the research provides some evidence of positive outcomes from investment in TVET which range from labour market or employability benefits through to social and environmental sustainability perspectives.

The research indicates the importance of ensuring that any measurement of ROI should be closely aligned to the objectives of the TVET system of a country. ROI measures related to the economic outcomes of TVET (for example, employment related outcomes) are seen as being critically important across all countries. Social aspects are also important, and tie into the objectives of the systems, but these social measures are often indirectly linked to the economic ones requiring more evidence to establish the link. For example, a reduction in crime among young people was seen to be linked to improvements in young people in employment.

Finally, measuring ROI in a given country has its challenges but the diversity of TVET systems and the differing contexts of the countries pose considerable difficulties for cross-country comparisons of ROI. A challenge is to develop measures of ROI that can be compared across countries, while another is having appropriate data to enable the measurement of ROI. This challenge has several aspects to it including the need to have ROI in mind when setting up data collection and reporting systems and linking it back to the objectives of the TVET system.



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National Centre for Vocational Education Research

Level 5, 60 Light Square, Adelaide, SA 5000
PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

Phone +61 8 8230 8400 **Email** ncver@ncver.edu.au

Web <<https://www.ncver.edu.au>> <<http://www.lsay.edu.au>>

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