

A synthesis of foundation learning evaluation and research in New Zealand since 2003

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List of abbreviations

ALL	Adult Literacy and Life Skills survey—New Zealand results are due out from late 2007
ETS	Educational Testing Service, Princeton University
FLP	Foundation Learning Pool (previously known as the Adult Literacy Pool and the Adult Literacy Innovations Fund)
IALS	International Adult Literacy Survey (carried out in 1996)
ISO	A system of certification in quality management
LLN	Literacy, language and numeracy
NCSALL	National Center for the Study of Adult Learning and Literacy, a consortium of US research organisations, based at Harvard University
NRDC	National Research and Development Centre for Adult Literacy and Numeracy; a consortium of UK research organisations based at the University of London
PD	Professional development
PDQ	Prose, Document and Quantitative literacy test
SME	Small to medium enterprises
WLF	Workplace Literacy Fund

Executive Summary

This synthesis aims to provide an overview of research and evaluation information drawn from all recent New Zealand adult literacy, language and numeracy (LLN) initiatives. The report has been commissioned by the Department of Labour to inform the Upskilling Partnership project, which is researching approaches to engage employers in workplace literacy, language and numeracy programmes, to help raise their productivity. A national survey (OECD, 1997) showed that approximately 46 percent of the workforce may have low literacy, language or numeracy skills that impact negatively on their ability to participate fully in society and work.

The overall objectives of the synthesis were to:

- identify the main findings, key lessons and gaps from New Zealand literacy, language and numeracy research and evaluation in all contexts since 2003
- identify effective ways to initiate, establish, maintain and complete successful literacy, language and numeracy initiatives to inform subsequent developments
- identify how LLN provision can best be monitored and how present monitoring systems can be refined to match these factors
- review how well the LLN initiatives have been researched and evaluated and how research and evaluation can be improved for future developments.

Overview of the research available

Research up until 2003 was dominated by the need to prove that low literacy, language and numeracy were issues for individuals, their communities and the country. Since then, research has focused on how provision operates, who participates and how it can be improved. Many initiatives in this sector are relatively recent. It takes some time to achieve significant and lasting impact from LLN programmes, particularly when researching impacts such as sustained changes in workplace practices or literacy behaviours within a family and community life. The programmes being studied may be effective, but research and evaluation may be unable to demonstrate their impact as yet.

The studies reviewed for this synthesis are of varying quality, but they constitute 'the best available evidence'. Reliable research on learner outcomes, the broader impact of programmes and more detailed analyses of provision are still limited.

Key findings

Employer awareness of the need for LLN

Many employers are unaware of the links between low literacy and productivity or workplace performance. Companies may be aware of, and talk about, health and safety concerns, accidents, poor workplace documentation and error rates, but they do not necessarily make the connection to 'literacy' as a key factor underpinning these issues. Companies that already invest in workplace training may be more likely to recognise that LLN skills are important for future success.

If companies do recognise their workforce has LLN issues, they may be reluctant to take action. Employers use a range of strategies to minimise the impact of poor LLN skills, including developing oral culture in the workplace, rewriting documentation, and changing work practices (including investing in plant and equipment). A common response is to pass LLN requirements onto a person in a team with the best skills or to the team leader; which can make it difficult to recruit new team leaders if these people are not confident about their LLN skills. These strategies are used in

preference to directly addressing skill issues through LLN programmes, which is seen as expensive and not related to core business.

The research on what helps companies initiate programmes run is still limited. No single factor appears to drive companies to invest, but pre-conditions appear to be:

- skills shortages
- when it is important that operators and production staff have basic LLN skills
- where training has already been provided for front-line staff (which may have been less successful than expected).

Awareness is often raised when employees don't complete training, when training does not result in the change anticipated or when there are compliance issues around health and safety and quality.

Factors that help or hinder the establishment of workplace LLN programmes

Companies that have run workplace literacy initiatives are likely to have a committed company driver for LLN programmes, strong support from senior management and good information about training and funding. Larger manufacturing enterprises may be more likely and small and medium enterprises less likely to invest.

Many employers don't know where to get affordable and appropriate programmes and the time cost required to find appropriate providers was an issue as well as the costs of programmes themselves. Some employers do not want to gather evidence of problems within their organisations because they did not believe they had the capacity to offer solutions.

Developing companies' and ITOs' capacity to plan and run programmes, and to promote the business benefit arguments for workplace literacy generally, is an important part of developing LLN provision in the long term. Workbase has been specifically funded to support the development of workplace literacy models and resources with companies, providers and ITOs.

The lack of demand for programmes makes it hard for providers to develop viable workplace literacy businesses quickly. Educational providers find it hard to think in terms of business benefits and to market their services to companies, rather than learners. General workplace training providers do not always have the LLN teaching expertise required. Provision in the workplace is not easy, with organisational constraints due to production and workflow. Typically, programmes have involved individual or small group provision for one or two hours per week, for either 24 or 48 weeks. The low density of employees in small and medium enterprises makes it expensive and difficult for them to organise training.

Industry Training Organisations (ITOs) also play an important role in promoting LLN. Like companies, they vary in awareness and expertise in relation to LLN. It takes time and resources for ITOs to develop the skills and strategies needed to deal with LLN in their training systems for their diverse sectors. The diversity in the scale and structures of ITOs mean that a variety of approaches is needed to engage them and their industries. Profiles of the literacy, language and numeracy requirements of jobs and particular roles help employers and ITOs understand the issues. Profiles often reveal that induction training and health and safety processes require more LLN skills than employees use on the job.

The range and availability of providers matched to demand

Institutes of Technology and Polytechnics (ITPs) are required to become major drivers of LLN provision in their regions over the next three years, which may include workplace delivery. Workplace provider numbers are modestly increasing (from five in 2001 to 22 in 2006), but workplace literacy expertise is not yet readily available in all areas of the country.

It is difficult to identify accurately the amount of LLN provision currently offered, but it is still well short of the scale of need identified by IALS—particularly in the workplace. There is a diverse mix of programmes in the current LLN system, consistent with the diversity of learners and their circumstances. People with low LLN skills are more likely to be enrolled in certificate level programmes or industry training than in other tertiary education, but LLN skills are not necessarily explicitly taught on those programmes.

The Foundation Learning Pool funds both new LLN provision and additional support for learners in existing programmes (other than in the workplace) and there is a dedicated Workplace Literacy Fund which meets most of the costs of programmes in companies. Both sources are funding only small amounts of provision. Innovative practices that develop from those programmes are reported primarily in monitoring reports and are not widely known in the sector.

Provision quality

New quality assurance arrangements for foundation learning are only just coming on stream, so their impact will not be known for some time.

Integrated provision, where LLN skills are taught explicitly alongside another body of knowledge and skills, has been promoted as a cornerstone for the sector. It is under-researched given its importance and there needs to be more investigation of this model and the outcomes it achieves.

Outcomes of learners

There was modest evidence of increased LLN skills from the few studies that included credible statistical evidence of learner gain. Better quality data may be available when there is a national assessment and reporting tool. Very little LLN specific data is available relating to course completions or LLN course costs.

Tutor workforce

Tutors are central to LLN provision, but there has never been any comprehensive research into the LLN tutor workforce. The new qualifications for adult literacy educators and workplace and vocational tutors are only just coming on-stream.

There is an increasing amount of research on effective LLN practice and how to disseminate these findings through professional development (PD). LLN practitioners and administrators value their involvement in PD and report changes in their professional practices as a result, although this has not been empirically verified to date.

The characteristics of learners involved in LLN

Programmes are successfully recruiting learners broadly consistent with the findings of the IALS results, although there is very limited evidence about the actual LLN levels of learners. There are variations in participation across different forms of provision. Women tend to be in non-workplace programmes, while men are more

commonly in workplace programmes. Maori are well represented in most programmes, even those run by non-Maori providers. Pasifika are under-represented overall, other than in workplace programmes. Pasifika people were more likely to be in IALS Levels 1 and 2, so their low numbers are a concern.

There is limited evidence about how best to recruit learners, although pro-active recruitment by people with credible links to potential learners is probably the most effective strategy. There is variable evidence about the retention of learners once they are in programmes; some programmes do not report retention, others appear to over-report attendance or under-report dropouts. Learner motivation is diverse, even within the same programme and usually changes over the duration of tuition. There is no research available on non-participants.

The extent to which LLN research findings influence provision and future planning

There is very limited research on the economic value of LLN programmes which can include immediate or early impacts on measures such as waste, injury rates and absenteeism and longer term effects such as monetary assessment of the productivity gains for employers and earnings gains for learners. There are only two return-on-investment (ROI) studies. ROI research is complex and costly and needs to be undertaken by experts and include sufficient time for empirical data collecting. Few studies include costings in their reporting, which is probably due to commercial sensitivity, although some of this information may be available in-house within the agencies concerned.

While New Zealand LLN can be usefully informed by much of the overseas literature that is currently emerging, the evidence gaps described above show there is still a need for some issues and developments to be informed by a robust local LLN research programme developed across all the agencies with an interest in LLN.

Recommendations

Recommendations are listed in priority order within each section below. They also appear in shaded boxes at relevant points in the text.

Shifting workplace practices

1. Engagement with workplace LLN programmes appears to be predominantly provider-driven. Much more emphasis is needed to increase employers' awareness about LLN issues. The resulting increasing demand will give providers greater incentives to continue to invest in the infrastructure they need. Useful approaches include:
 - using case studies of successful workplace LLN programmes to market the benefits of LLN programmes to employers. Employers are more likely to pay attention to success stories about workplace literacy from 'businesses like ours'.
 - making information about funding subsidies more readily available to employers
 - providing employers with information and support on how to choose appropriately skilled providers.
2. There needs to be ongoing support to new and existing workplace literacy providers in specialist LLN teaching and also on constructing arguments and evidence about the business benefits of workplace literacy programmes.
3. ITOs will continue to need ongoing support for some time, while they build their capacity to deal with LLN issues across their sectors.
4. Support for projects that analyse the LLN skills of jobs and industries would be helpful, accompanied by mechanisms to make the results widely available.

Developing effective LLN provision

5. Research into integrated provision is important if we are to be confident that our models of integrated practice are in fact achieving the anticipated learner LLN skills gain that UK research has demonstrated to be possible. Specialist LLN teaching expertise is required to enable the integration of LLN into vocational programmes. We need to understand what can be realistically achieved by upskilling vocational tutors, investigate the extent to which integrated programmes explicitly teach literacy, language and numeracy and understand the nature of the specialist support required.
6. As ITPs develop the capacity and capability to deliver LLN within their institutions and to influence developments across their region, it would be helpful to map:
 - the mix of programmes that develop in each institution and across each region
 - how each provider intends to measure LLN gain
 - how each ITP intends to measure the development of capacity and capability internally
 - the availability of provision for learners with very low skills, both within institutions and across regions
 - the number and characteristics of the learners attracted to different sorts of programmes
 - the extent and nature of LLN needs in each region, drawn from the ALL results

- whether and how providers create pathway learners from lower to higher NQF level programmes or from general to more contextualised programmes, and the barriers and obstacles for doing this.
7. Clearer data on learner gains in LLN will come when there is a national assessment tool that shows progress on the Foundation Learning Progressions, to give us both specific and nationally standardised data. The tool needs to be designed and tested with practitioners and a wide range of learners across different programmes and in a variety of contexts. Extensive professional development on assessment will need to accompany the tool.
 8. Developing a common measure of changes in confidence and literacy behaviours that providers could use alongside other outcome measures would provide consistent and quantifiable results in an area that many teachers, employers and learners think are as important as LLN skills gain.
 9. It is timely to have a comprehensive review of the Foundation Learning Pool—the types of programmes, recruitment and retention issues in those programmes, evidence of learner gain and the issues providers have found in endeavouring to grow their programmes.
 10. Quality online, free self-study programmes would be a valuable addition to the mix of provision. Self-study has the potential to supplement taught provision as well as provide an option for those who want to ‘brush up’ their LLN skills. This initiative would require a multi-year investment and would benefit from development by a consortium of providers and technical experts.
 11. There would be value in new and different mechanisms for disseminating information and ideas about good practice and innovative teaching and learning and provider development.
 12. Monitoring the effects of the Foundation Learning Quality Arrangements may provide useful information about the quality of provision.
 13. More timely analysis of monitoring reports from the Foundation Learning Pool and the Workplace Literacy Fund may provide information on how provision is increasing, diversifying and building on what has gone before.
 14. It would be useful to track and document the experiences and issues of ITPs over the next three years as they take up a leadership role in foundation learning in the regions, so effective strategies can be shared around the country.
 15. Given the investment in the Learning for Living project, and the time it takes to really bed in changes in practice, a follow-up is needed of the participating organisations and tutors to determine the degree to which the changes are implemented in daily teaching over the longer term. Identifying how the lessons from the Learning for Living project will be rolled out through the sector as a whole is also important.

Tutor workforce

16. An evaluation of the impact of the new qualifications is important for long-term workplace planning. This evaluation would need to investigate what sorts of tutors are being recruited into study, and document changes in teaching practices and whether qualifications have an impact on job retention or employment conditions. It is particularly important to understand the impact on the workplace trainers and vocational tutors who are doing the National Certificate in Adult Education and Training (Foundation Educators) to provide greater insight into integrated programmes.

17. If LLN provision is to be expanded, the LLN tutor workforce also needs to grow. Research about the numbers and characteristics of LLN specialist tutors, their skills and motivations, sources of professional development, and conditions of employment would help workforce planning and successful recruitment.
18. Professional development on assessment, in particular on formative assessment, would complement the professional development activities thus far. Individual organisations would benefit from in-house formative assessment projects.

LLN Learners

19. There needs to be a more concerted effort to recruit Pasifika learners in greater numbers and into more diverse programmes. Research is required to understand Pasifika perspectives on LLN issues and to understand what factors help their recruitment into programmes. Different recruitment strategies will be required.
20. It would be useful to do research into learner recruitment, retention and attendance patterns. The data and analyses available to date on these topics are patchy and have not been studied systematically.
21. With moves to encourage greater intensity and duration of provision, understanding patterns of participation and the extent to which learners are able to make use of the maximum hours available to them will be useful.
22. Research needs to incorporate more of the voices and perspectives of learners, to find out more about what they want, how they perceive LLN and the services they receive – an aspect that has been missing in much of the research to date.

Research processes and methodologies

23. Future evaluations of programmes need to have longer time frames to allow for more robust data collecting than self-report by providers, and greater triangulation of data sources, including feedback from learners.
24. ROI studies should be adequately funded, carried out by experienced economic researchers, involve empirical data collecting and of a scale that the results can be generalised to much wider audiences.
25. Researchers need to carry out different and more rigorous analysis of learner-gain data, particularly effect size analysis, and present their methodology and data more fully.
26. Studies need to increase the use of random samples and ensure that unsuccessful programmes or learners who drop out are included. Many of the studies reviewed have looked for 'success stories', which has probably skewed the picture of provision. Larger sampling will increase the likelihood of the generalisability of findings. Studies also need to use more rigorous quantitative analyses that are reported in full.
27. Analysis of data and descriptions of programmes and providers need to use appropriate comparisons. Understanding the similarities and differences between providers and programmes that operated under similar funding and reporting regimes would be more helpful than studies with undifferentiated findings. Groupings might include funding streams, purposes of programmes, numbers of learners, differences in intensity and duration.

All studies need to include more complete reporting of data and methodology. Shorter reports for more general distribution are useful, but they are not a substitute for full reports. Both need to be available.

Background

As part of Upskilling the Workforce, Government is currently funding a number of initiatives designed to improve the foundation skills of New Zealand adults. These initiatives are being funded and managed out of a number of government agencies, including the Department of Labour (DoL), Ministry of Education (MoE), the Tertiary Education Commission (TEC), the Ministry of Social Development (MSD) and the Corrections Department. Other agencies such as Accident Compensation Commission (ACC), Ministry of Women's Affairs, Ministry for Economic Development, Te Puni Kokiri, Pacific Island Affairs and Treasury also have an interest in this area.

While the initiatives have been tailored to fit these agencies' specific needs and contexts, it is important that all parties have an overview of research and evaluation information on all literacy, language and numeracy (LLN) programmes, irrespective of their funding source. This research synthesis will contribute to this understanding by providing an overview of New Zealand literacy, language and numeracy research carried out in New Zealand since 2003.

This synthesis builds on an earlier review of foundation learning research (Benseman, 2003a), which identified 54 studies carried out from 1977 to 2003, most of which were small-scale, had limited findings and were not replicable. The findings of this present review are expected to inform policy decisions, to influence the nature of the evaluations undertaken in the future, as well as indicate new research studies to provide additional information and insight where needed.

Policy relating to adult LLN

The Upskilling Partnership Programme, established as part of the Upskilling the Workforce, is a new government initiative set up to find out more about supporting businesses and their employees to build foundation skills of reading, writing, maths skills, problem solving and communicating well in the workplace. The purpose of the Upskilling Partnership Programme is to gain a better understanding of the needs of businesses and employees. It aims to explore in-depth what models and approaches work and what the outcomes are of foundation skill development in the workplace for the business and employees.

Initiatives within the Upskilling initiative and in foundation learning generally are guided by the current Tertiary Education Strategy and the Statement of Tertiary Education Priorities (STEP) 2008-10 (Ministry of Education, 2007). The strategy calls for improving the quality and effectiveness of foundation learning in order to:

- significantly increase the literacy, language and numeracy skills of the workforce at the low-skilled end
- improve settlement outcomes for new migrants and refugees
- raise the foundation skills of parents with poor educational attainment who want to support their children's learning (p.22).

Increasing literacy, language and numeracy levels for the workforce is one of four priority outcomes for the Strategy.

The STEP recognises the new importance of foundation learning, which has moved from 'a relatively marginal position within the tertiary education system to being a core activity' (p22). The focus on the workplace is different from the broader 'Raise foundation skills', which was one of the six strategies in the first STEP (Ministry of Education, 2003c).

Over recent years, the work programme within foundation learning has been guided by three key elements in the New Zealand adult literacy strategy *More than Words* (Ministry of Education, 2001b).

- *Developing capability* to ensure adult literacy providers deliver quality learning through a highly skilled workforce with high quality teaching resources
- *Improving quality systems* to ensure that New Zealand programmes are world-class
- *Increasing opportunities* for adult literacy learning by significantly increasing provision in workplaces, communities and tertiary institutions.

Four principles were proposed to underpin the strategy:

- gains for learners will be achieved as quickly as possible
- programmes will match learners' needs in content and pace
- best practice, evaluation and research will guide programme development
- programmes will be suitable for the wide range of learners.

These elements and strategies continue to have an impact on the work of those government departments with an interest in foundation learning.

The first mention of foundation skills in a policy document came in the review of industry training, *Skills for a Knowledge Economy* (Ministry of Education, 2001c). As one of its six issues for consideration, the report called for the raising of the levels of foundation skills among the New Zealand workforce and The Adult Literacy Strategy was released later that year. The Ministry of Education also developed specific strategies for adult and community education (Ministry of Education, 2001a) and English for Speakers of Other Languages (ESOL) (Ministry of Education, 2003a), both of which advocate for increased provision and improved quality in literacy, language and numeracy and which have influenced the development of services.

Also in 2001, the Maori Adult Literacy Working Party, working to the Associate Minister of Maori Affairs, the Honourable Tariana Turia, released its own policy document *Te Kawai Ora* (Maori Adult Literacy Reference Group, 2001). The report recommended the re-writing of *More Than Words* strategy, to reflect a broader view of education and literacy, to include a Treaty-based concept of bi-literacy in te reo Maori and in English, and that literacy be defined as 'the lifelong journey of building the capacity to read and shape Maori and other worlds.' This report is widely quoted by non-government organisations as reflecting a Maori perspective on adult LLN, but appears to have had little direct impact on the government's approach to LLN.

The LLN component of tertiary education has neither an agreed name nor a fixed definition. Policy documents refer to *foundation education*, *foundation skills*, *foundation learning*, *adult literacy* or more recently, *literacy*, *language and numeracy*.¹ The core skills are listening, speaking, reading, writing and numeracy. Other skills and competencies are included; for example, the 2007 STEP includes literacy, language and numeracy, basic computing and interpersonal skills in *foundation education* (p. 6). Later in the same document, *foundation learning for adults* incorporates the skills above and also critical thinking, problem-solving, and communication technology (p. 22). Typically qualifications and programmes at NQF Levels 1 to 3 constitute *foundation* level.

¹ We use the terms *foundation learning* and *literacy, language and numeracy* (LLN) interchangeably in the report. LLN is now commonly used overseas.

The extent of literacy, language and numeracy skills shortages

The IALS in 1996 indicated that approximately 46 percent of the New Zealand workforce had low LLN skills that might limit their ability to participate fully in society and might also be a barrier to increasing productivity. People with low LLN skills are more likely to be over-represented in South and West Auckland, Porirua, eastern Bay of Plenty, East Cape, Gisborne, the far North, lower Taranaki and western King Country (Culligan, Arnold, Sligo, & Noble, 2005).

Looking ahead, a significant proportion of the 2020 workforce is already in work—many with low LLN skills. Newcomers to the workforce now who are unskilled will need LLN support over coming years to successfully take part in tertiary study or cope with the increasing demands of the workplace. In 2006, 11 percent of school leavers left with no or low school qualifications². Unqualified school leavers are disproportionately Maori and male.

There may be large numbers of people with low literacy, numeracy or language skills, but they are not recruited easily to programmes because they do not always recognise they have literacy issues or are embarrassed to ask for help (Bynner & Parson, 2006; OECD, 2000).

Review aims

The overall aims of this evaluation synthesis are to:

- identify main findings, key lessons and gaps from research studies about literacy, language and numeracy initiatives in New Zealand since 2003
- identify the most effective and efficient ways to initiate, establish, maintain and complete successful LLN initiatives in order to inform the planning of subsequent LLN initiatives
- identify how LLN provision can best be monitored and how present monitoring systems can be refined to match these factors
- review how well the LLN initiatives have been researched and evaluated and how research and evaluation can be improved for future developments.

More specifically, the review seeks to answer the following research questions:

A: Shifting workplace practices

1. What degree of awareness is there of the need for LLN skills programmes and the means to address them?
2. What factors have enabled or hindered the initiation and establishment of LLN skills programmes in various contexts?

B: Developing the capability and quality of effective LLN provision

3. To what extent does the range and availability of LLN providers match the demand for these programmes?
4. What evidence is there to indicate the quality of LLN skills provision?
5. To what extent, and in what ways, have specific initiatives been implemented and contributed to the quality of LLN skills provision?

²

http://www.educationcounts.edcentre.govt.nz/indicators/education_and_learning_outcomes/qualifications/school_leavers_with_no_qualifications

What learning and other outcomes are being achieved across provision funded by the various agencies?

C: Motivating and assisting individuals

6. What are the characteristics of learners involved in LLN initiatives?
7. What motivates learners to initially engage and sustain their involvement in LLN programmes?

D: Longer term information needs to ensure continuous improvement and ability to report on and inform decision making in the development of an upskilling strategy

8. To what extent, and in what ways, have the findings of the LLN skills research programme been implemented into current planning and provision?
9. To what extent have the areas of LLN provision been evaluated and further developed as a result of the evaluations?

Scope of the synthesis

In broad terms, the literacy, language and numeracy initiatives can be grouped into:

- *Research*—providing baseline information to inform developments
- *Infrastructure development*—including assessment tools, learning progressions, quality systems
- *Provider development*—improving the quality of provider organisations
- *Tutor development*—projects to improve the professional skills of tutors
- *Provision*—increasing the number of programmes and the extent of explicit LLN teaching

The degree to which these initiatives have been researched or evaluated varies considerably, and therefore this synthesis draws on studies that are quite diverse and of variable scope and depth. All contexts, including LLN programmes in the workplace, community, tertiary institutions, and those funded by government agencies have been included. This synthesis has been commissioned by the Department of Labour, so particular attention has been paid to research findings that relate to LLN provision in the workplace.

Specific criteria for inclusion of studies in this review were:

- those completed since the 2003 review of LLN research³
- New Zealand-based studies that drew on original data⁴
- those covering issues and topics relating to literacy, language and numeracy
- those that were publicly available.⁵

Issues of quality

In most research syntheses, the reviewers apply stringent quality criteria when deciding which studies can be included for analysis (Cooper, 2007). This is a luxury that cannot be afforded in LLN generally (see Comings & Soricone, 2007 for a discussion of this issue in the United States), and certainly not in a small country like

³ A few studies with earlier publication dates are included because they were not in the earlier review and are relevant to the current research questions.

⁴ Recent New Zealand-initiated reviews of international LLN literature have been referred to as appropriate, but their findings have not been specifically incorporated into this synthesis.

⁵ There are additional reports that are relevant to this review, but not yet publicly available.

New Zealand. Both the quantity and quality of LLN research have made great progress over recent years, due largely to the research programmes of the National Research and Development Centre (NRDC) in England and the US-based National Centre for the Study of Adult Literacy and Learning (NCSALL). Despite this progress, the field still lacks the funding, and subsequently the depth and quantity, of research studies that most other educational sectors have achieved. Some of the implications of this 'poor cousin' status of LLN research include:

- studies lack the scale, depth and sophistication necessary to demonstrate outcomes with a high degree of confidence and generalisability
- limited use of strategies that monitor and improve research quality such as peer review and publication of findings in refereed journals
- a limited pool of researchers and evaluators to draw on in this emerging field, meaning that the level of research and evaluation expertise is probably less than in more developed sectors. This is particularly true of expertise in quantitative research.

Although some of the initiatives reported here have been in operation for some years, many have only been developed more recently (often as 'pilots'). It takes some time to achieve significant and lasting impact from LLN programmes, particularly when researching impacts such as changes in workplace practices or sustained changes in literacy behaviours within a family and community life. The programmes being studied may be effective, but the research may be unable to demonstrate their impact at such an early stage of development.

The approach that we have taken in this present report is similar to that adopted in our LLN literature review (Benseman, Sutton, & Lander, 2005), which also grappled with a paucity of high-quality research studies. We have cast a wide net of inclusion and reviewed a number of studies in order to present 'the best available evidence'. We have given credence to studies that have achieved good standards of research practice, such as rigorous sampling procedures, high return rates, larger sample sizes (where appropriate), good links to other LLN research, strong conceptual foundations and ultimately, relevance to the review's research questions.

Methodology

A research synthesis has to use a variety of search strategies to ensure a comprehensive range of studies are reviewed (Cooper, 2007). The initial list of research and evaluation studies reviewed in this report was compiled from the authors' personal research archives, a search of Index New Zealand and a search of the New Zealand Literacy Portal.

Relevant government agencies, key provider groups, researchers and other LLN resource people were asked to review the initial list and identify any other relevant studies. Each of the studies was then read by one of the authors, who analysed it for data and conclusions relating to the research questions. These findings were then incorporated into an individual review report, using standard headings:

- title, author, funding agency, date, publication details
- purpose and scope of report
- review of methodology
- summary of main findings
- key points emerging from the findings
- recommendations and general comments.

Each of these reviews was then read and verified by another reviewer. When there are a number of studies on the same topic, these have been combined into a single

review (for example, the Learning for Living and Family Literacy projects, some of the Wanganui and Employment studies and some of Workbase's multi-year projects). These reviews constitute the 'data' for the synthesis.

All studies by Benseman and Sutton (the authors of this report) were independently reviewed by an experienced researcher, Alison Gray, who also peer-reviewed the final report.

In addition, eight studies that included statistical data about learner gain were reviewed by Dr Gavin Brown, Senior Lecturer in Research Methodology at the School of Teaching, Learning & Development in the Faculty of Education, The University of Auckland. Subsequently, he wrote a short paper on analysing educational data that will be useful for informing future research and has therefore been incorporated into the report as Appendix A.

Two studies that analysed the return on investment (ROI) of educational programmes were reviewed only by either Associate Professor Tim Maloney, Deputy Head of the Economics Department of The University of Auckland or Dr. Geoff Perry, Associate Dean of AUT University.

Recent overseas LLN research has been referred to in a small number of cases where there are gaps in our knowledge or the topic is of particular importance.

Structure of the report

The body of this report discusses the review's research questions, drawing on the aggregated data from the reviews. Where there are differentiated findings, the results are given separately for workplaces and other contexts.

Section A, *Shifting workplace practices*, discusses the research that relates specifically to LLN in the workplace, including employers' understanding of workplace literacy and information about workplace literacy providers.

Section B, *Developing effective LLN, provision* looks at what is known about the range and quality of provision, outcomes for learners, the tutor workforce and infrastructure initiatives.

Section C, *Motivating and recruiting LLN learners*, considers the limited research on learners, including what motivates them to participate and stay engaged in foundation learning.

Section D, *Information to inform future developments*, discusses the longer term information and research needs of the foundation learning sector and presents a list of recommendations.

Appendix A, *Issues in statistical measurement of learner gain*, is a short report by Dr Gavin Brown on analysing and evaluating statistics to help improve the quality of research long-term.

Section A—Shifting workplace practices

Shifting workplace practices requires employers to firstly know if LLN skills are an issue in their workplace, to be prepared to take action and then to know where to go to get help. This section considers research on employers and on the organisations that support workplace literacy programmes.

Employer awareness of the need for LLN skills programmes

A number of studies showed that many employers were not generally aware of literacy and its links to productivity or business performance (Franklin et al., 2005; Neilson et al., 2006; Schick, 2005; Workbase, 2003b, 2005a, 2006a).

The largest of these studies (Schick, 2005) was a phone survey of 470 Chief Executives (CEs) of companies with more than 50 employees from 10 different industry sectors, including 28 percent from manufacturing, 17 percent retail, 13 percent health and community services, and 11 percent wholesale. The study built on in-depth interviews with 14 CEs of companies that had already invested in LLN workplace programmes. The study grouped employer responses according to the extent to which they had engaged with LLN. The majority of respondents had issues in their workplaces that may be related to LLN, but they did not identify them as such. Just over 20 percent had invested in literacy programmes or recognised literacy was an issue.

Of those surveyed:

- 12 percent were in Phase III. In other words, they were *doing it and had invested in workplace literacy*. These companies had three common factors: a committed company driver with strong support from senior management; access to information about training (including from their ITO); and the ability to locate the right training provider and funding. All of the CEs reported similar benefits from investing in LLN programmes, including increased employee confidence, motivation, participation and loyalty as well as more tangible results such as reduced errors and staff turnover.
- 10 percent were in Phase II. In other words, they were *aware—they had considered workplace literacy training*. These companies were already involved in workplace training and recognised that LLN was important for their future success.
- 46 percent of the respondents were in Phase 1. In other words, they were *unaware and favourable—they would consider programmes*. They had skill shortages, found it hard to recruit staff with the LLN skills they wanted and found human resource issues challenging. They had not specifically identified LLN as an issue in their workplaces.
- 32 percent were Unaware—they *would not consider literacy training*. These employers tended to be smaller, disproportionately in the wholesale and retail sectors, not providing much in the way of training and were less interested in ISO (international quality management certification) or other standards. They reported less concern with accurate form-filling, oral communication or employee participation in meetings than the group above. A proportion of these CEs believed LLN was an issue for schools, but not for them. The 'Unaware and unfavourable' are a substantial group, but LLN is not likely to be a priority for them because there do not appear to be sufficient drivers for them to invest in training or because they do not make the link between literacy and any performance issues.

This survey suggests that larger manufacturing companies are more likely to move from Phase 1 to Phase II or III. No common single factor drove companies to invest, but pre-conditions appeared to be skills shortages, when it was important that line staff have basic literacy skills and where they already offered training for line workers (which was sometimes less successful than companies had anticipated).

More than half of those in Phase I had experienced issues with employees estimating or calculating quantities, oral communications, form-filling and compliance issues and 80 percent had issues with re-working, following instructions or wastage. Employers had not thought of literacy training as a way of addressing those issues, whereas those in Phase II recognised the link between line workers job demands, business issues and LLN. That awareness often came when employees did not complete training, expected benefits did not arise from training, or compliance issues arose related to health and safety or quality.

Companies reported barriers to moving into Phase III, the investment phase, including: the costs of training, the lack of research and argument to convince senior managers of the business benefits, and the need to get employee buy-in on a sensitive issue.

Suggested strategies to move companies from awareness to investment in programmes included documenting and publicising success stories in a variety of ways—‘stories of businesses like us’. The ‘Doing it’ group may play an important role here by providing content for these stories. Other strategies to reduce barriers included increasing information about the business benefits of workplace literacy programmes; and increasing the engagement of ITOs with literacy so they can act as information brokers.

The 10 enterprises (meat and seafood processing, and community support services) that took part in a project that profiled the LLN skills of entry-level jobs (Workbase, 2005a) had different levels of awareness of the skills of the workforce. While some enterprises ‘knew’ they had issues, they were not necessarily ready to deal with them, and some appeared to avoid finding out getting hard evidence of employees’ skills.

A survey of 16 employers in Wanganui (Franklin et al., 2005) reported skill shortages, driven more by increased demand for LLN in the workplace rather than a drop in skills. Employers made assumptions about people’s skill levels, and larger employers appeared to know less of the LLN skills of staff than smaller employers. Smaller employers said numeracy was an issue.

In a follow-up e-survey of 56 Wanganui employers (Neilson et al., 2006) 36 employers said they screened new applicants, but not necessarily for LLN skills. Those employers rated personal qualities (such as being honest and healthy with a work ethic) and relationship skills as more important than literacy skills. The ability to ‘follow instructions’ was the most important communication skill, followed by ‘to get on with others’ and ‘to speak and communicate clearly’. Some employers said they would employ more staff if they could find adequately skilled ones; 75 percent of employers said they would not employ people with low LLN. If they did have to employ people with low skills, they would recruit for a willingness to learn. Employers in general in this survey did not think it their responsibility to train employees in foundation skills.

A study of employers in 20 Auckland-based small-to-medium enterprises (SMEs) (Workbase, 2003b) reported a lack of awareness and engagement similar to those in

the patterns presented in the Phase 1 and Unaware categories in Schick's study. SMEs with apprentices were more likely to participate in training, but most did not have trainees and the cost of any training was seen as a major barrier. Interestingly, only two SMEs could name their ITO at that time (2003). In general, the SMEs in the survey saw no strategic or even short-term value in considering literacy. The low density of learners in SMEs makes it difficult and expensive to organise provision and even free LLN training may not be taken up. Some of the issues SMEs talked about related to LLN, even though the employers were unaware of the connection—health and safety concerns, cultural differences, working with young people, and in particular, issues relating to supporting apprentices.

The reports on the Descriptor Bank project (Workbase, 2006a, 2006b) said that employers didn't always recognise the range of underpinning literacy skills in jobs or make the link between a lack of reading, writing or numeracy skills and problems such as wastage and re-works. Changes in the workplace often made employees' lack of literacy skills more apparent. For example, there may be a significant impact on a company if the workforce has low literacy skills and also a process or procedure or machine changes, compliance or registration requirements change, qualifications are needed or the requirements in qualifications change, or when key staff leave or are promoted.

Some employers do recognise the importance of LLN skills. The Industry Training Federation has surveyed ITOs and a small group of employers to have a better understanding of the LLN skills and knowledge employers were looking for in school leavers (Beardslee, 2006; Industry Training Federation, 2006). ITOs and employers wanted reading, listening and speaking, form-filling, problem-solving, measuring, using fractions, ratios, and statistics skills, expressed in a range of unit standards.

Factors that help or hinder the establishment of LLN programmes

LLN programmes come about when companies have identified the links between performance issues and literacy and have found a strategy for addressing the problems identified. As Schick's model above illustrates and as was pointed out in the 2002 evaluation of the Workplace Literacy Fund (Skill New Zealand, 2002b), companies may take time and need a number of factors to come together before they are ready to recognise literacy may be an issue.

Terminology may be a factor—some people interpret 'literacy' as school-style or academic reading and writing, (for example, reading poetry and essay writing), that is irrelevant to the workplace (Workbase, 2006a). Some employers reported being dissatisfied with the 'communication skills' of current or prospective employees without recognising the overlap between communication and literacy (Franklin et al., 2005; Neilson et al., 2006; Skill New Zealand, 2002b; Workbase, 2005a). Employers valued oral communication and understanding instructions (Beentjes & Reid, 2006; Franklin et al., 2005; Neilson et al., 2006), with critical thinking and numeracy also important. These broad interpretations reflect the bundle of skills referred to as LLN in policy documents.

Employer awareness of the means to address LLN needs

Even when employers recognise literacy may be an issue, many do not always believe it is their responsibility to fix it, arguing that it is the responsibility of schools. Others may be concerned that an investment in training staff will be wasted because staff will leave. A range of studies described employers, both larger and smaller, endeavouring to 'get around' LLN rather than addressing it (Beentjes & Reid, 2006; Franklin et al., 2005; Neilson et al., 2006; Skill New Zealand, 2002b; Workbase,

2003d, 2006a), although larger companies with HR and training functions were more likely to have some interest in LLN programmes.

Companies often move staff out of areas that require literacy, develop oral cultures so that information and instructions are given much more verbally than in writing, rewrite documentation, or change work practices (including investment in plant and equipment), to minimise the literacy demands on employees (Workbase, 2006a). In the SME study (Workbase, 2003b), most managers knew which staff had LLN problems (because of the small workforce) and 'got around' the issue by matching the job requirements to the skill level of the employee, using a 'buddy' to help, and passing responsibility to team leaders or to an individual team member who had the best LLN skills. The increasing LLN demand on team leaders often makes it more difficult to recruit people into those roles.

Having recognised the issue, employers did not always know where to go for affordable and appropriate programmes (Franklin et al., 2005; Neilson et al., 2006; Workbase, 2003b). The cost of LLN training was also an issue for employers (Schick, 2005) in terms of direct costs and lost production, as well as the time needed to organise training. A lack of information about subsidies can be a barrier. Employers were also concerned about the time and expertise required to locate providers and judge their course content and approach.

Company trainers and workplace assessors were not always confident about tackling LLN issues because of time pressures and concerns that the issue was moving outside their areas of expertise (Beentjes & Reid, 2006; Workbase, 2006a). Trainers and assessors were concerned that they, or their organisations, would not have the capacity to offer people any help if they were assessed and found to have LLN problems. There were concerns that employees identified with very poor skills would need skilled teaching over an extended period. Also, some trainers and workplace assessors may have literacy issues themselves, which makes them reluctant to attempt to identify the issue in others.

Support from qualified workplace literacy providers

Effective workplace LLN programmes require specialist expertise over and above general experience in adult education or workplace training. There is no research on how companies independently go about setting up workplace literacy programmes, only on how they are helped into programmes by the brokerage and support of workplace literacy providers, and Industry Training Organisations. Approximately \$710,000 of government funding has been spent on employer-focused research and development projects by Workbase in the last four years.

In 2003, there was still little demand from employers for workplace literacy programmes and an absence of workplace literacy providers throughout the country. Over the last four years, Workbase has been contracted by the TEC to increase the capability of workplace literacy providers outside Auckland—an investment of approximately \$1.9 million over six years. The Supporting Workplace Literacy Providers (SWLP) development project discussed below has been reported in a series of Statements of Service Performance to the Tertiary Education Commission (Workbase, 2003c, 2004a, 2005f, 2006e) and a number of synthesis documents (Workbase, 2006c, 2006d, 2006e) rather than in conventional research reports.

More than 20 providers (ITPs, PTEs, community and commercial companies) have been offered a range of tailored activities over three years to assist them develop their workplace LLN provision. The activities have included:

- information
- resources
- models and templates
- distance coaching
- assistance with business planning
- marketing
- appropriate pedagogy for workplace programmes.

The support from Workbase has been highly rated by providers in internal evaluations. Core elements of workplace provision have been advocated. They include:

- an initial literacy needs analysis (now a requirement for a subsidy from the TEC Workplace Literacy Fund)
- regular teaching by a skilled tutor
- a programme contextualised to the individual workplace
- individual learning plans
- a curriculum and process that provides benefits for both learners and businesses.

Typically, programmes have been small (fewer than 20 learners), with varying models of intensity and duration and small group or individual teaching. Small group or individual provision is offered because many companies can only release one or two people from a production line at a time.

The development of LLN capability takes time and money which is challenging, particularly for smaller providers. The lack of demand for programmes has meant that ongoing viability is an issue for providers trying to break into a new area. Initially, programmes tended to be 'small, short, infrequent and geographically dispersed' (Workbase, 2006e, p13). Larger providers have more capacity to resource development (including marketing and carrying staff costs until programmes come on stream), but are not always as flexible as small businesses in meeting the employer's needs.

Findings from the SWLP suggest that education providers may find it hard to develop a business-oriented way of thinking and to market their services to companies rather than learners. On the other hand, more generic training organisations with no specialist LLN background are more likely to find it hard to build in the specialist capacity required for specific and deliberate LLN teaching. Customising each programme, while meeting the needs of the company, means that providers have ongoing development costs for each programme, with limited economies of scale from repeating programmes or re-using resources.

Companies may take a long time to move from expressing an initial interest to actually signing a contract. Some companies (number unspecified) have been reluctant to sign up to an initial literacy needs analysis, which is considered to be a cornerstone of good workplace practice. These companies may not be ready to identify and act on LLN issues within departments or teams, but may be willing to get help for individual employees—which can lead to larger programmes later. Greater progress is made when companies have some awareness of LLN issues from the outset, rather than attempting to recruit by cold-calling. Subsidies are important to get workplace programmes underway (Skill New Zealand, 2002b, p25). Companies usually want a quick turn-around between signing up with a provider and getting started, so they look for fast approval of funding.

The current funding subsidy does not allow for non-teaching developments such as re-writing training materials and does not help new providers with systems development, marketing, networking and professional development.

Support from Industry Training Organisations

Industry Training Organisations are playing an increasingly important key role in helping companies identify LLN issues and set up literacy programmes. Since 2004, more than 18 ITOs (including the 10 largest) have been involved in development projects with Workbase to develop their organisational capacity to offer leadership around foundation learning. A number of ITOs have been involved in more than one project. The findings for this section come from Workbase's project reports or Statements of Service Performance to TEC (Workbase, 2004a, 2005b, 2005c, 2005d, 2006a, 2006b, 2006c, 2006d, 2006e) rather than research studies per se. Two reports (Workbase, 2004a, 2005d) present the perspectives of ITO Chief Executives whose ITOs were not, or only minimally, involved in LLN projects.

ITOs are employer-driven, so it is significant that they report that many employers are not aware of literacy issues and the links between literacy, job performance and productivity—confirming the findings from employer-related research. Workbase reports also show how ITOs themselves vary in their capacity and readiness to engage with literacy. Some ITOs have been working on LLN issues for years and have developed organisation-wide strategies, while others are working primarily at developing an understanding of the issues.

It takes time for ITOs to understand the implications of LLN and to build their capacity to act on it, just as it does in companies. Often it requires repeated exposure to discussions about literacy and potential benefits of LLN within the training system for that to happen. The drivers are different in different sectors—for some it is health and safety or compliance, in others it is labour shortages or changing skill demands. ITOs are looking for examples and success stories to use with employers, to gain traction on the issue.

Where ITOs have collaborated with Workbase on joint projects, the approaches or strategies have had to be adapted for each ITO, illustrating the point that no single model of engagement with LLN will work because of differences in the size, scale and complexity of ITO structures. Also, the models of training delivery (on- or off-job, face-to-face courses or self-study resources) impact on how LLN provision might take place. Some ITOs have developed training cultures more than others.

ITOs can support raising the skills of their workforce in a variety of ways:

- being more explicit about the literacy skills within qualifications
- ensuring the industry training they provide integrates literacy alongside vocational content
- providing teaching and learning resources that support literacy development (some self-paced learning material is complex and acts as a barrier to trainees)
- encouraging employers to invest in specialist workplace literacy programmes.

Analysing the literacy demands of job roles, creating literacy profiles of industry sectors and having industry-specific information about LLN has been useful for many companies and ITOs as a starting point for considering whether to invest in programmes (Reid & Richardson, 2002; Workbase, 2005a, 2006a, 2006b). Frequently, the profiling and analysis process reveals that induction information and processes and training, including initial health and safety, require more LLN skills that employees have to use on the job (Workbase, 2005a, 2006a). Profiling is being used

internationally to help industry understand the pattern of skill demand.⁶ Workbase has analysed a small number of roles and created literacy profiles (including the literacy demands of training) that are available on their website.⁷

Engagement with workplace LLN programmes appears to be predominantly provider-driven. Much more emphasis is needed to increase employers' awareness about LLN issues. Increasing demand will give providers greater incentives to continue to invest in the infrastructure they need. Useful approaches include:

- Using case studies of successful workplace LLN programmes to market the benefits of LLN programmes to employers
- Making information about funding subsidies more readily available to employers
- Providing employers with information and support on how to choose appropriately skilled providers

There needs to be ongoing support to new and existing providers in specialist LLN teaching and on the business benefits of workplace literacy programmes.

ITOs will continue to need on-going support for some time, while they build their capacity to deal with LLN issues across their sectors.

Support for projects that analyse the LLN skills of jobs and industries would be helpful, accompanied by mechanisms to make the results widely available.

⁶ Canada has invested in developing 200 essential skills profiles for entry level jobs, to help both prospective employees and employers to understand the skills demands, provide supporting materials for trainers etc. http://srv108.services.gc.ca/english/general/home_e.shtml

⁷ See <http://www.workbase.org.nz/Article.aspx?ID=418>

Section B—Developing effective LLN provision

A quality foundation learning sector needs a well-developed and accessible network of providers and programmes to meet the needs of diverse learners. The teaching workforce will be appropriately trained and there will be a range of systems and services available to providers and learners. There will be good quality standard information on whether learners make gain on programmes. This section presents data from studies that focus on providers, programmes and teaching and learning, both in the workplace and in other contexts.

The range and availability of LLN providers

Institutes of Technology and Polytechnics (ITPs) are expected to become major drivers of foundation learning in their regions as the TEC new Investment Guidance regime comes into being in January 2008.⁸ ITPs are now directed to increase the numbers of learners who make progress on their LLN skills while undertaking qualifications at NQF Levels 1-3 and to improve their capability for delivering foundation learning (Tertiary Education Commission 2007, p. 39). Three-year funding will be available for ITPs to increase their capacity and delivery of LLN programmes.

The new approach should result in more systematic information about provision and demand.

Some ITPs will take time to develop LLN programmes (both integrated and stand-alone) of a scale and quality that will be expected, as the programme evaluations reviewed illustrate.

Workplace provider numbers have increased from five in 2001 to 22 in 2006, with support offered to providers in 12 different geographic areas. A pilot project was also funded over three years to develop a Pasifika workplace literacy provider in Auckland (Workbase, 2005e), a process that proved to be complex and slow. Not many ITPs have had sustained involvement in workplace LLN programmes.

Matching provision to demand

It is difficult to accurately identify the amount of LLN provision currently offered because the skills may (or may not) be incorporated into a wide variety of programmes, and the amount of specific LLN teaching is unclear. The one systematic study that endeavoured to map what LLN provision was available in 2003 found it difficult to differentiate programmes that explicitly taught LLN from other low NQF level programmes (Sutton, Lander, & Benseman, 2005). Therefore, it is not possible to judge whether there are enough providers or an appropriate mix of programmes. Nor is there any monitoring data available that show how much provision is available in those areas for people with high need.

Assuming enrolment in NQF low level certificate programmes as a crude proxy for LLN need, approximately 215,000 people with LLN needs were in the tertiary education system in 2005 (Ministry of Education, 2006b, pp78-92).

- 59,000 students were enrolled in mixed-field qualifications in Level 1-3 certificates with a focus on foundation education, ESOL and te reo Maori. The majority of those students were enrolled at wananga (51 percent), doing one of

⁸ See <http://www.tec.govt.nz/upload/downloads/investment-guidance.pdf>

three programmes—KiwiOra (15,300 students), Lifeworks (12,100) or MahiOra (9,100). The numbers enrolled in foundation learning qualifications is currently decreasing. Students access these programmes through the 20 ITPs, the three wananga and some PTEs.

- 121,000 trainees were enrolled in industry training at Levels 1-3, with approximately 56,600 in Levels 1-2 programmes.
- 16,400 people were enrolled in Training Opportunities and Youth Training programmes with about 400 private training establishments. TO and YT are programmes for people with 'employment and educational disadvantages' and most are assumed to have LLN needs.

In addition to those enrolled in the programmes above:

- more than 3,2009 learners participated in projects funded from the Foundation Learning Pool (formerly the Adult Literacy Innovations Pool) (Ministry of Education, 2006b, p90). The Foundation Learning Pool is the major funding source for LLN specific programmes, but the amount of explicit LLN teaching may vary across programmes.
- Approximately 6,500 new migrants and refugees received ESOL tuition from ESOL home tutors and approximately 7,500 learners received literacy tutoring from Literacy Aotearoa.
- 900 learners were in workplace LLN programmes funded from the Workplace Literacy Fund, a companion fund for the Foundation Learning Pool. Clearly funding for workplace literacy is a very small component of the current tertiary system.
- Approximately 700 beneficiary applicants had MSD-funded adult literacy programme assistance in 2003-2004 (Clarke, Ramasamy, & Pusch, 2006).

As ITPs develop the capacity and capability to deliver LLN within their institutions and to influence developments across their region, it would be helpful to map:

- The mix of programmes that develop in each institution and across their region
- How each provider intends to measure LLN learner gain
- How each ITP intends to measure the development of capacity internally
- The availability of provision for learners with very low skills, both within institutions and across each region
- The number and characteristics of the learners attracted to different sorts of programmes
- The extent and nature of LLN needs in their region, drawn from the ALL results
- Whether and how providers create pathways for learners to move from lower to higher NQF level programmes, or from general to more contextualised programmes, and the barriers and obstacles for doing this.

Obstacles to extending the range and availability of providers

As a newly-developing field, LLN provision faces a 'chicken and egg' situation where it is difficult to expand the range of provision without a commensurate increase in demand and vice versa. This uncertainty of demand is probably one of the main reasons that many providers (including ITPs) employ most tutors on a part-time basis and short-term contracts.

⁹ Some of these will have been counted in the TEI figures above

The SWLP project reports show financial viability to be one of the main factors affecting the availability of workplace literacy providers. Anecdotal evidence about providers leaving the field tends to support these observations, and that voluntary organisations such as Literacy Aotearoa and ESOL Home Tutors face a constant challenge of losing their trained tutors to paid providers such as TEIs or workplace providers.

Some community ESOL and adult literacy programmes run waiting lists because at a particular time they don't have the right mix of tutors to match learners one-to-one, or they have insufficient resources to run small groups, but there is no systematic information about that issue.

Provision quality

NZQA has developed a Foundation Learning Quality Assurance (FLQA). All tertiary education providers will be conducting in-depth self-reviews¹⁰ of their foundation learning programmes against the FLQA requirements from 2007. The FLQA requirements cover six areas:

- planning and design
- resources
- staff
- learner access and entry
- delivery
- review and development.

The foundation learning sector was involved in the development of these requirements (Workbase, 2002). At this early stage, no research on its implementation or value has been carried out. It would be useful if the impact on provision was evaluated in the next few years.

Programmes funded by the Foundation Learning Pool in 2004 were evaluated to provide a comprehensive description of programmes and their outcomes and to identify specific aspects that may contribute to the LLN development of learners. Evaluations were carried out for Maori programmes (Kempton, 2005), Pasifika programmes (Gibbs, 2005); whanau literacy (May, Hill, & Donaghy, 2004), the Manukau Family Literacy Programme (MFLP) (Benseman & Sutton, 2005) and general programmes (Roorda, van Wichen Miller, Watson, & Poppelwell, 2005). Generally, these programmes have been innovative in recruiting learners and are showing good results in retaining learners, according to a meta-analysis of four evaluations of the general, Maori, Pasifika and family literacy programmes (Quigley, 2005).

Most of these evaluations were constrained by time and by sampling issues, and relied on self-report by providers rather than independent data collection. They were primarily descriptive, included little analysis and did not include robust data on learner outcomes. Only the Manukau Family Literacy Programme had built in an evaluation strategy from the start and their data collecting on learner gain was also limited to self-report, although it was triangulated across several sources.

Monitoring the effects of the FLQA may provide useful information about the quality of provision. This may be a standard part of NZQA processes or may require a separate research project.

¹⁰ <http://www.nzqa.govt.nz/for-providers/foundation/docs/flqa-selfreview.pdf>

Future evaluations of programmes need to have longer time-frames to allow for more robust data collecting than self report by providers and greater triangulation of data sources, including feedback from learners.

Integrated provision

LLN-specific courses focus solely on the teaching of LLN skills. Integrated programmes include explicit LLN skills teaching as well as (and equally important to) the skills and content related to another course—such as retailing, building or food processing. Integrated provision has become a major platform of the foundation learning sector with policy and funding arrangements geared to providers integrating LLN into vocational, pre-employment and workplace programmes. This makes it challenging to differentiate LLN programmes from other low NQF programmes, which may include learners with LLN needs.

International research points to benefits from integrating LLN into other contexts provided this provision involves literacy tutors as well as vocational tutors. The most significant study on integrated learning internationally thus far involved 1,916 learners on 79 vocational programmes in the UK (Casey, 2006). The research developed a four-point scale to determine the extent of embedding (integrating) LLN into the vocational context from the learners' point of view. On a course that was not embedded, any LLN teaching that took place would be separate and distinct; on fully-embedded programmes LLN was treated as integral to the vocational programme. The results clearly showed that learners on vocational programmes where literacy was fully embedded have higher retention and success rates and achieve better in literacy, language and numeracy qualifications.

Most importantly from the New Zealand perspective, Casey's study stresses that "when a single teacher is asked to take dual responsibility for teaching vocation skills and LLN the probability of learners succeeding with literacy and numeracy qualifications is lower" (p 6). Formal shared and ongoing planning and team work between vocational and LLN specialist tutors were identified as key factors for bringing about learner gain in the UK research. This is very different from New Zealand, where a lot of emphasis appears to be going on improving the ability of vocational tutors to integrate literacy into their teaching, without necessarily a sustained partnership with a literacy tutor.

There have only been two research studies specifically into integrated practice, both done as the concept was being introduced (Skill New Zealand, 2002a; Workbase, 2001a). We believe that in many programmes where integration is supposedly taking place, there is probably very little direct literacy teaching of LLN skills (Benseman, Lander, & Sutton, 2005; Gibbs, 2005; Skill New Zealand, 2002a; Sutton, 2004). Interestingly, one study of providers mentioned concerns from literacy tutors about a lack of professional development for them when they work for generic training providers, and a lessening of importance of specialist literacy skills with the introduction of the integrated approach (Neilson & Culligan, 2005).

Research into integrated provision is important if we are to be confident that our models of integrated practice are in fact achieving the anticipated learner LLN skills gain that UK research has demonstrated to be possible.

Specialist LLN teaching expertise is required to enable the integration of LLN into vocational programmes. We need to understand what can be realistically achieved by upskilling vocational tutors, investigate the extent to which integrated programmes

explicitly teach literacy, language and numeracy and understand the nature of the specialist support required.

Quality of programmes

The Foundation Learning Pool has funded the growth in LLN-related programmes. Funding is available for intensive programmes (100+ hours per year) and to enhance the LLN component of Student Component or TO- and YT-funded programmes. In 2007, approximately 100 providers were funded to run 240 programmes, worth approximately \$16 million.¹¹ Learner numbers for 2007 are unknown as yet, but the growth is obvious—in 2005 approximately 3,200 learners participated in 54 Pool-funded programmes worth \$3 million. The only published review of the fund was just after it started (Ministry of Education, 2003b), when 48 programmes were funded from 28 providers.

Overall, there is very little research on teaching and learning strategies and approaches, other than the development work done on reading and numeracy within the Learning for Living project.

Tutors and providers would benefit from easier access to information about innovative programmes inside New Zealand—most information on programmes appears to be presented only in monitoring reports to funders. The major national regular communication mechanisms to tutors thus far have included *Literacy Works*, the *Literacy Portal* and the *Learning for Living* newsletters and communication workshops. More use could be made of the insights from Foundation Learning-funded programmes presented in monitoring reports. Other opportunities include directed discussion lists in the USA¹² or a website for LLN practitioners.

Given the rapid growth of this funding, it is timely to have a comprehensive review of the Foundation Learning Pool—the types of programmes, recruitment and retention issues in those programmes, evidence of learner gain and the issues providers have found in endeavouring to grow their programmes quickly.

There would be value in new and different mechanisms for disseminating information and ideas about good practice and innovative teaching and learning and provider development.

Self-study programmes

Increasingly, overseas systems are including self-study programmes (often online) that people can access in their own time as part of the mix of LLN provision.¹³ This provision can supplement face-to-face tuition. Recent US research shows that self-study also helps learners with broken attendance to keep building their skills between periods of formal enrolment in LLN programmes (<http://www.lsal.pdx.edu/>).

Access to these sorts of programmes may be of particular value to 'rusty learners' who lack fluency and practice, or as follow-up programmes for learners once a taught

¹¹ For information on the FLP go to <http://www.tec.govt.nz/templates/standard.aspx?id=913>

¹² <http://www.nifl.gov/lincs/discussions/discussions.html>

¹³ *Move on* and *Move On Up* are self-study programmes in the UK to help adults brush up their skills ready to sit a National Literacy or Numeracy Test. <http://www.move-on.org.uk/index.asp>.

Ich-will-schreiben-lernen is a high quality multi-media modular course for reading, writing and speaking being developed in Germany. Currently 20,000 students are enrolled. See http://www.zweite-chance-online.de/uploads/media/2007-05-09_Press_kit_english.pdf of more information. An English language version is being scoped at present.

programme has finished. Two New Zealand studies referred to self-study programmes.

The first related to the free-entry distance education programme Lifeworks—although the study was an analysis of the cost benefits (Castalia Strategic Advisors, 2005) rather than a detailed analysis of the pedagogy. Lifeworks is a modular and primarily text-based programme with workbooks and video resources, supported by a coach who periodically visits students in their homes. The course offers an NQF Level 1 certificate. It aims to develop communication skills, personal discipline, relationship skills, teamwork abilities and training in mathematics and computer skills (p.15)—some (but not all of which) are ‘literacy’—thus illustrating how LLN may be part of, but not necessarily explicit, within other low-level tertiary programmes.

Lifeworks targets low socio-economic learners. Approximately 50 percent of learners referred to in the study had no qualifications and 37 percent were on benefits—some of the characteristics of learners expected to be in IALS Level 1 and 2. Of the 17,000 who enrolled in Lifeworks, there was an average course completion rate of 44 percent, which is above the national average for certificate completion. Of those who reached kits 5 and 6, 56 percent stair-cased to higher study (Castalia Strategic Advisors, 2005). Like many TEI courses, the amount of specific LLN content or skills teaching is not able to be identified, and there are no assessments that show whether learners made specific LLN skills gains by participating in it. The report illustrates that distance education programmes can successfully recruit learners with the socio-demographic characteristics of people with LLN needs.

The second innovative programme was LAMP—an e-learning tool developed for teaching literacy and maths. LAMP is a series of interactive multi-media modules accessed online; the programme is designed to be self-study, but with the aid of a facilitator. The evaluation showed that the programme pilot was not considered a success (Te Haeata Education Training Services, 2004), but the developers argued this was because the evaluation was carried out on an incomplete pilot model (Future Skills, 2004).¹⁴ The evaluation and rebuttal raise a number of important points about the creation and evaluation of online tools which need to be taken into account before similar ventures are undertaken.

Quality online free self-study programmes would be a valuable addition to the mix of provision. Self-study has the potential to supplement taught provision as well as provide an option for those who want to ‘brush up’ their LLN skills. This initiative would require a multi-year investment and would benefit from development by a consortium of providers and technical experts.

Outcomes for learners

The most commonly discussed outcomes for learners are increased LLN skills, improved confidence and gaining qualifications.

Improved LLN skills

Many studies reported increases in LLN skills, but only a small number provided statistical evidence of learner gain—the Learning for Living projects, and single studies on ESOL and family literacy. All the statistics on learner gain in these studies were reviewed by Dr Gavin Brown.

¹⁴ See <http://www.tec.govt.nz/templates/standard.aspx?id=1026>

The Learning for Living projects involve professional development for tutors to integrate specific teaching strategies¹⁵ related to either reading or numeracy into their practice. Both strands involved the pre- and post-testing of learners, with the hypothesis that learners would improve their achievements as a result of their teachers' participation in professional development (PD). Aggregated findings from three reading cluster reports (Chandler, 2006; Doyle, 2006; Young, 2006) showed that 70 percent of the 149 learners with two data points made 'modest gain'.¹⁶ The 149 learners were approximately 60 percent of the original cohort of 252 learners. Learners with higher ratings in the pre-test improved more, which is understandable given the short time between assessments. Feedback from learners suggested they had become more confident in test-taking and could articulate more reading strategies.

The statistical review by Brown notes that Pasifika students, students from non-English speaking homes and female students from Auckland appeared to have made very poor gains in reading in these projects. He questions whether the degree of gain is sufficient or different from that achieved by any other teaching programme.

The equivalent reports on the three numeracy clusters (Higgins, 2006; Meaney, 2006; Thomas, 2006) reported data on 194 learners (74 percent of the original cohort of 261). The proportion of competent learners increased on average 19 percent across the seven numeracy domains of the Number Framework that was used to measure progress. Learners had not improved in confidence, but felt better about how they were being taught by the second assessment. Gain appeared to be greater with women, those receiving 40+ hours teaching and those aged over 25. However, 50 percent of learners in the numeracy clusters appear not to have made measurable improvements.

The statistical review said a clear pattern of increased scores for some learners was evident but that it was not possible to ascertain the statistical significance of these results. Brown argued that it is not clear whether the gains exceeded chance or whether the teaching program had caused the gain.

One of the small number of studies focusing on ESOL endeavoured to determine the literacy gain made by low-level or pre-literacy ESOL learners on a one-semester literacy course (Shameem, McDermott, Blaker, & Carryer, 2002). In total, 118 learners took part, but only 62 had data from pre- and post-testing (approximately 50 percent of the initial cohort). Measurement of progress was by both self-report and performance assessment. There was statistically significant improvement on the performance assessments for those on the 12-hour per week writing programmes (240 hours in total) and for those who had a bi-lingual tutor for reading. The statistical review highlighted the small sample and large numbers of non-completers, as well as possible alternative explanations for the large learner gain.

The summative evaluation of the Manukau family literacy programmes (MFLP) (Benseman & Sutton, 2005) reported on 70 adults and 70 children. In the MFLP model, the adult learners attend a full-time programme tertiary education programme on-site in a school and take part in literacy-related activities with their children and in

¹⁵ The selection of these strategies was influenced by the international literature review (Benseman, J., Sutton, A. et al (2005) commissioned earlier by the Ministry of Education.

¹⁶ Gain was measured by a component of the Prose Document Quantitative (PDQ) test from Educational Testing Service (ETS) in the US. The PDQ is based on the IALS methodology.

parent education. Pre- and post-data was available on 23 adults (based on self-reporting of LLN and confidence) and 21 children (based on Running Records). The adults reported large improvements. The statistical review highlighted that the children's gains were not demonstrably different from a control group of children and cautioned about the 'halo effect' that results from self-report.

Measuring gain is complex, because learners make variable gains for a variety of reasons including their skills at the commencement of the programme, the fit of the programme with their personal circumstances and their readiness to learn. Ethnicity should be considered as a variable when considering learner gain. It is not possible to compare gains across programmes because they do not share a common assessment tool, so the degree of impact on learners' LLN skills remains a largely uncharted territory.

The review of the learning gain statistics highlighted a number of issues that researchers need to more carefully consider, including the type of instruments used to measure gain, whether the teaching intervention can reasonably be considered the cause of any improvement and the quality of reporting. Appendix A discusses these issues in more depth.

Clearer data on learner gains in LLN will come when there is a national assessment tool that shows progress on the Foundation Learning Progressions to give us both specific and nationally standardised data. The tool needs to be designed and tested with practitioners and a wide range of learners across different programmes and in a variety of contexts. Extensive professional development on assessment will need to accompany the tool.

Gains in confidence

Like many social intervention programmes, the most commonly reported outcome from LLN programmes is an increase in personal confidence (Benseman, 2004a; Benseman & Tobias, 2003; Gibbs, 2005; Kempton, 2005; May, Hill, & Donaghy, 2004; Skill New Zealand, 2002b), although the studies used different terminologies and approaches to measure the gain.

Often dismissed as a 'soft outcome' that is difficult to measure and deemed to be of lesser value than improvements in LLN skills, self confidence is seen by learners and tutors as a valuable outcome and is increasingly being recognised internationally (Eldred, 2002). In reporting the high number of respondents who had been out of LLN programmes for more than two years, Benseman and Tobias (2003, p. 23) described the significance of improving self-confidence for LLN learners.

The relationship between gains in self-confidence and gains in literacy skills is clearly complex, but they are strongly inter-related. At least two forms of literacy-related confidence were referred to [in their interviews]. Some said that their increased ability to read, spell, write, solve maths problems, or speak in a group (including in English as a second language) had led to increased confidence in these skills, which in turn had led to greater levels of general self-confidence.

There were others who claimed that they had made little or no progress in improving these skills. On the other hand, while some of these interviewees said that there had been little, if any, change in their levels of confidence (with one or two stating that the programme had an adverse effect), others said that their self-confidence had increased nonetheless, as they had discovered

that they were not alone with their difficulties and they had developed further strategies and ways of dealing with their difficulties. One of the most common comments from these people was that they said they had gained the confidence to tell people of their difficulties and ask for help.

In other words, improvements in literacy skills almost invariably resulted in greater self-confidence, but improvements in self-confidence (through learning self-assertions skills for example) may occur with little or no change in literacy skills. In the latter case however, improved levels of self-confidence can still give the participants greater self-awareness and a wider range of skills to manage their literacy difficulties in their daily lives.

Increased confidence leads to increased or different LLN practices—more reading on the job or for pleasure, taking on writing tasks not previously attempted, greater willingness to answer questions, helping children with their homework, more reading at work (Benseman, 2004a; Benseman & Tobias, 2003; May, Hill, & Donaghy, 2004; McDermott, 2004; Roorda, van Wichen Miller, Watson, & Poppelwell, 2005). Again, the diversity in reporting and the lack of a framework means data can't be meaningfully aggregated.

Developing a common measure of changes in confidence and literacy behaviours that providers could use alongside other outcome measures would provide consistent and quantifiable results in an area that teachers and learners think as important as LLN skills gain.

Course completion

Course completion is often used as a proxy measure of literacy skills, but the problem of attributing LLN gains comes when courses do not include any direct measures of literacy. Course completion of L1-3 certificates nationally is low (Scott, 2004). Some studies reviewed reported generally on course completion or unit standard achievements (Benseman, 2004a; Castalia Strategic Advisors, 2005; Ministry of Education, 2006b; Skill New Zealand, 2002b; Sutton, Lander, & Benseman, 2005), but the findings are limited.

LLN provision costs

Only a limited amount of information about costs of provision was available from the studies reviewed. Costs could reasonably be expected to be collected in programme evaluations, but are not usually in the terms of reference for evaluations at present, presumably for issues of commercial sensitivity. The cost effectiveness of programmes can't be measured without quality learner outcome data and robust data on the longer term economic impact on earning.

Programmes funded from the Adult Literacy Innovations Pool in 2002 (Ministry of Education, 2003b, p37) had a maximum funding per semester of \$50,000, which was raised to \$75,000 for full courses in 2003.

The evaluation of the Workplace Literacy Fund (Skill New Zealand, 2002b p. 24) reported that costs per project ranged from \$20,000 to \$150,000 and \$2,500 to \$4,000 per learner for a 'year of learning' (one hour a week, individual or small group)—although it is not clear how these figures are calculated for these quite different forms of provision. Skill New Zealand's contribution to the projects ranged from \$8,000 to \$90,000. The report concludes that this degree of cost variation is not surprising given the variations in project objectives and different intensity of learning. They also note how complex it is to document fully course costs.

The evaluation of ESOL programmes (McDermott, 2004) reports that costs per learner ranged from \$500 to \$1,000 and the author concludes that the programmes are ‘very cost effective’ (p. 6), although she does not provide any justification or workings for this conclusion. She notes (p. 6) that, ‘programme implementation costs vary due to differences in the intensity and duration of the learning, location, student numbers and staffing.’

The Ministry of Social Development funded approximately 700 clients for personalised literacy assistance in 2003-2004 for approximately \$1.3 million (Clarke, Ramasamy, & Pusch, 2006), an average of \$1,850 per learner.

Where costs have been included, there was little detail or breakdown of the cost structures and comparisons across types of programmes, let alone reporting the basis for making judgements about ‘value for money’ or relating the costs to differentials in programme outcomes.

Tutor workforce

LLN provision ultimately rests on tutors, but there has never been any comprehensive research about the workforce as a whole. The only documentation is on the community sector, where tutors are predominantly female, Pakeha and middle-aged and many work part-time (Sutton, Lander, & Benseman, 2005). Identifying the workforce is made more complex if there is to be consideration of not only literacy, ESOL and numeracy tutors who ‘specialise’ in literacy, but also vocational tutors with an interest or skills-set in literacy—there may be hundreds of the former, but thousands of the latter. ESOL tutors are usually different from literacy tutors; they tend to have formal language-related qualifications, which has not been the case for adult literacy tutors to date.

There are difficulties in recruiting skilled tutors generally (Roorda, van Wichen Miller, Watson, & Poppelwell, 2005) and within Pasifika and Maori programmes specifically (Gibbs, 2005; Kempton, 2005). At a local level, a report on interviews with 20 tutors from 12 different providers in one town (Neilson & Culligan, 2005) mentioned tutors’ concerns about their lack of a career structure.

Professional development activities

Achieving learner gain is, of course, linked to the quality of the teaching offered in LLN provision and developing qualifications has been recognised as a key component of raising quality.

Before 2006, there were no specialist LLN qualifications available for LLN teachers in New Zealand. Now there are two National Certificates, one for specialist LLN teachers and the other for vocational tutors or workplace trainers who integrate literacy into other programmes—both are at NQF Level 5. The Ministry of Education has provided up to 500 scholarships for students as an incentive to enrol in these programmes. In 2007 AUT introduced a Master in Adult Literacy and Numeracy Education, but there is still a gap at Diploma and Bachelor levels. There are a number of providers offering these programmes, but it is unclear yet whether the demand is sufficient to keep all courses viable.

If LLN provision is to be expanded the LLN tutor workforce needs to grow. Research about the numbers and characteristics of LLN specialist tutors, their skills and motivations, sources of professional development, and conditions of employment would help workforce planning and successful recruitment.

An evaluation of the impact of the new qualifications is also important for long term workplace planning. This evaluation would need to investigate what sorts of tutors are being recruited into study and document changes in teaching practices and whether qualifications impact on job retention and changes in employment conditions.

It is particularly important to understand the impact on the workplace trainers and vocational tutors who are doing the National Certificate in Adult Education and Training (Foundation Educators) to provide greater insight into integrated programmes.

The Learning for Living professional development project has been the largest PD initiative in the sector to date. The focus on professional development related to LLN subject knowledge and teaching strategies in reading and numeracy was informed by the literature review on effective LLN teaching (Benseman, Sutton, & Lander, 2005) and the findings from the first round of Learning for Living exploratory projects.

Five or six providers were recruited in geographic clusters. Two tutors attended regular PD sessions with their manager and the tutors practised using new approaches in their classes between PD sessions. Reading clusters ran in Waikato/Bay of Plenty, Wellington and Auckland, and numeracy clusters ran in Christchurch, Auckland and Central North Island. External developers ran the cluster meetings and acted as coaches for each provider. An evaluation project run by external evaluators has run alongside the projects. The latter stages of the project have involved managers and tutors endeavouring to roll out these new approaches more widely across their organisations. A series of communications workshops is currently being held throughout the country to disseminate the findings from this project (Jakob-Hoff & Postlethwaite, 2006), and a written handbook for tutors on the new approaches is being produced to supplement these workshops.

Tutors in both the reading and numeracy strands have reported increased knowledge about those subjects, and appreciated the sustained opportunity for professional development. In the numeracy strand, the least experienced tutors reported gaining the most. Providers have responded positively to the programme as well. The data on tutors' changes in practice is based on self-report.

Given the considerable investment in the Learning for Living project and the time it takes to really bed in changes in practice, a follow-up is needed of the participating organisations and tutors to determine the degree to which the changes are implemented in daily teaching over the longer term. Identifying how the lessons from the Learning for Living project will be rolled out through the sector as a whole is also important.

The observation study of 15 LLN teachers (Benseman, Lander, & Sutton, 2005) also pointed to issues about broad teaching skills, not just LLN-specific ones. Some teachers lacked questioning skills and used a limited range of teaching strategies. The findings are illustrative only because the sample was small, but they point to the need for professional development on ways to increase learner involvement in lessons and to give learners more focused feedback. There is increasing emphasis internationally on the role of formative assessment in improving the quality of teaching and related learner gain in adult LLN, including skills such as questioning and giving feedback to learners. Formative assessment focuses specifically on the interactions between teachers and learners and has the potential to enhance both general teaching and subject specific skills in LLN. Formative assessment has had a major impact on learner achievement in schools, particularly for low performing

students. This led to an OECD study¹⁷ on the use of formative assessment with adult foundation learning which will finish early 2008; the Ministry of Education commissioned a background report on formative assessment in New Zealand during 2006 as part of that study. Formative assessment has the potential to play a major role in the development of quality teaching and needs to be considered in the mix of professional development activities being planned by the TEC. PD activities in formative assessment are probably best placed to happen within individual organisations.

Professional development on assessment, in particular on formative assessment, would complement the professional development activities thus far. Individual organisations would benefit from in-house formative assessment projects.

Some tutors may not have the literacy skills necessary to participate in a PD programme or to teach reading and writing confidently (Jakob-Hoff, Postlethwaite, Stokes, & Talagi, 2003; Sutton, 2004).¹⁸ Lack of LLN teaching skills was also a finding from this project which involved 80 tutors.

There have been other significant PD activities—for example, Workbase's programme of intensive reading and writing workshops and the programmes for member schemes run by Literacy Aotearoa and ESOL Home tutors, but these have not been formally evaluated.

Infrastructure developments

A comprehensive foundation learning system needs a variety of tools and support mechanisms to support providers, tutors and learners.

Assessment tools

The assessment methodologies and processes used in foundation learning are varied and not always rigorous. Often more emphasis goes on initial than summative assessment (Hattie, Sutton, & MacKay, 2007; NZCER, 2006). Many programmes use Individual Learning Plans and the identification and achievement of learners' goals as the assessment drivers and the principal measurement method is learner self-report. The standardised assessments that are used tend to be short tests that lead to scores, which are of limited diagnostic value (Hattie, Sutton, & MacKay, 2007).¹⁹ Tutors spend time and energy making assessment resources from scratch and contextualising them to each situation or course because contextualised teaching, learning and assessment is thought to be more effective than standardised approaches (NZCER, 2006; Sutton, 2004).

Many studies identified the need for a system that provides reliable and standardised national outcome data (Benseman, Sutton, & Lander, 2005; Hattie, Sutton, & MacKay, 2007; Kempton, 2005; NZCER, 2005; Ramasamy, Pusch, & Clark, 2005; Roorda, van Wichen Miller, Watson, & Poppelwell, 2005; Sutton, 2004). The May 2007 budget allocation for a national adaptive computer-based foundation assessment tool for foundation learning provides an opportunity to achieve this. The ability to do fast initial screening of general groups of people (in particular,

¹⁷ The authors of this report have participated in this study as OECD technical specialists. For more details see <http://www.oecd.org/dataoecd/35/23/35687039.pdf>.

¹⁸ This issue is not confined to New Zealand. For example, LLN teachers in California are required to sit a test of their own LLN skills in addition to teaching qualifications.

¹⁹ This study has only just been submitted and has not been summarised in this review

beneficiaries), to identify whether a more in-depth assessment of their LLN skills is warranted, has also been identified as an issue (Ramasamy, Pusch, & Clark, 2005; Sutton & Benseman, 2005) and a project is underway to adapt a UK screening tool for use here.

Generally tutors are enthusiastic about taking part in training on assessment, and many are coming to see value in standardised assessment. This was borne out in the Learning for Living clusters, where tutors found the diagnostic interview on numeracy and the focus groups used to assess learners' understandings of reading to be particularly insightful.

Foundation learning progressions

The draft Foundation Learning Progressions²⁰ released by the TEC in 2006 endeavour to identify the common sequence of knowledge and skills that adults need to develop in order to reach foundation level competence (and be prepared for lifelong learning). The progressions cover seven strands (speaking, listening, reading, writing, number, reason statistically and measurement) over six steps. Step 1 is entry level and Step 6 broadly equates to NCEA Level 2 (Year 12) or Level 2 on the NQF. The progressions reflect 'patterns of progress' rather than a prescribed linear sequence of learning.

The Progressions are designed to provide a common language and framework describing the learning that is needed to 'equip adults to be independent citizens, workers, family and community members.' Consultation for the draft progressions ended June 2007.

The New Zealand Literacy Portal

The New Zealand Literacy Portal (<http://www.nzliteracyportal.org.nz/>) is a free online information database funded by the TEC and run by Workbase. It is designed to provide a knowledge base of adult literacy information contributed by both New Zealand and international organisations. The Portal links to over 1,700 free items on topics including e-literacy, ESOL, financial literacy, health literacy, learning disabilities, literacy, numeracy and te reo Maori. Content includes:

- practical resources for use with learners
- resources for staff professional development
- research reports and case studies
- journal articles and newsletters
- a calendar of events
- links to adult literacy discussion lists.

The service was set up in 2003 and receives about 2200 visits (of 10+ minutes) per month. To date no formal evaluation has been carried out on the nature of the clientele, its patterns of usage or ratings of its utility and value, although several small in-house reviews have been carried out by Workbase.

²⁰ http://www.tec.govt.nz/upload/downloads/foundation_learning_progressions.pdf

Section C—Motivating and recruiting LLN learners

The advent of the IALS in 1996 (Ministry of Education, 1997; OECD and Human Resources Development Canada, 1997) provided a clear indication of the extent of adult LLN needs across the country as well as their distribution among sub-groups of the population. These findings have provided a useful benchmark against which programmes can compare their student clientele. The results of its successor, the Adult Literacy and Learning (ALL) national survey are due out late 2007 and will provide a more current set of benchmarks for comparison. ALL will also include a broader range of analyses than was possible with IALS.

Characteristics of learners involved in current LLN initiatives

It would be useful to know what proportion of programmes recruit learners with the lowest level of LLN skills, but there are no mechanisms for doing this at the moment. Data from the individual programme evaluation and monitoring reports show:

- LLN programmes funded by the Foundation Learning Pool recruit learners with low or no qualifications (Benseman & Tobias, 2003; Clarke, Ramasamy, & Pusch, 2006; Kempton, 2005; May, Hill, & Donaghy, 2004; Roorda, van Wichen Miller, Watson, & Poppelwell, 2005; Shameem, McDermott, Blaker, & Carryer, 2002; Sutton, Lander, & Benseman, 2005)
- more women than men are recruited in all but workplace programmes (Castalia Strategic Advisors, 2005; Doyle, 2006; Kempton, 2005; Sutton, Lander, & Benseman, 2005; Thomas, 2006) and this is especially true in family literacy programmes (Benseman & Sutton, 2005; May, Hill, & Donaghy, 2004). Conversely, 74% of learners in workplace programmes in 2003 were men.
- recruitment of Maori learners has been done successfully by Maori providers (Kempton, 2005) as well as non Maori providers (Roorda, van Wichen Miller, Watson, & Poppelwell, 2005)
- Pasifika recruitment has been low—they made up only 6 percent of the learners identified in foundation learning in the 2003 mapping study. They are more likely to be recruited in workplace programmes (Skill New Zealand, 2002b; Sutton, Lander, & Benseman, 2005), but workplace learner numbers are low overall (less than 1000 learners in total). Elsewhere, Pasifika learners have been recruited by both Pasifika and non-Pasifika providers. Pasifika providers have been able to recruit learners across the different Pacific communities (Gibbs, 2005).

The under-representation of Pasifika is of particular concern, as the IALS showed them to be prominent in Levels 1 and 2. Only two studies in this synthesis feature Pasifika learners or providers (Gibbs, 2005; Workbase, 2005e), and both these studies were limited in their scope and methodology.

There needs to be a more concentrated effort to recruit Pasifika learners in greater numbers and into more diverse programmes. Research is required to understand Pasifika perspectives on LLN issues or to understand what factors help their recruitment into programmes. Different recruitment strategies will be required.

One consistent theme of the reports is that many of the learners are 'high-need' individuals, especially in community and TO and YT programmes (Benseman, 2004b; Benseman & Tobias, 2003; Clarke, Ramasamy, & Pusch, 2006; Neilson et al., 2006). Learners often have limited economic resources and poor health. Some have learning difficulties and a history of failing in the school sector. Their complex social and learning needs make high demands on LLN teachers and programme support staff. Resources and time that would otherwise be used in LLN provision

often have to be diverted to address these issues. Providers feel that these sorts of demands are rarely addressed in LLN funding formulae. It is not clear if these patterns are found among workplace participants.

Variations in LLN levels

Only one study used an assessment tool where the results could be compared directly with the IALS levels—the *Learning for Living* reading clusters. The evaluators used a component of the Prose Document and Quantitative (PDQ) assessment tool that is broadly based on the original IALS methodology and provides results in IALS levels (Doyle, 2006). In the first round of reading assessments (that is, pre-programme intervention) only 40 percent of the learners were at the lowest level, Level 1 (11 percent or Level 2 (29 percent. The majority (48 percent were at Level 3 (usually seen as the minimum level for full participation in contemporary life), with 13 percent at Level 4 and nobody at Level 5. Unfortunately, the researchers do not give any further breakdown of these figures—for example, were the higher level students in integrated vocational classes, where there is probably a bigger range of LLN skills than in classes with an explicit LLN focus? There is also some indication that a few high-need learners may be deterred from enrolling in some programmes—providers want students who are more likely to make progress quickly and require less support (Benseman, 2003b).

These results raise several questions. What proportions of Levels 1 and 2 learners should reasonably be expected to be in LLN classes? Is 40 percent a low or reasonable proportion? Also, to what extent is learner recruitment influenced by the programme outcomes required by funders? People with very low skill levels will take longer to make progress—years in some cases.

Monitoring the socio-demographic characteristics of the learners only gives us a broad indication of success in recruiting the high-need LLN learners, but these characteristics are only crude indicators of need compared with actual LLN assessment results. For example, while a disproportionately high number of Pasifika adults are represented in Levels 1 and 2, there are also many who are in Levels 3-5. It is possible that providers are recruiting good numbers of Pasifika learners, but they are not necessarily Pasifika with high LLN needs.

The development and widespread use of a national assessment tool should go some way to answering these sorts of questions in time, but this brief indication points to the need to monitor provision in terms of LLN need (rather than just socio-demographic characteristics) wherever possible.

Learner motivation

Understanding what motivates people to seek help to improve their LLN skills can make a useful contribution to developing an effective system of provision. A range of diverse factors motivate learners and these can change throughout their period of participation.

Motivations reported often include quite general goals—‘furthering/completing their education’, changing/improving current jobs or achieving a short-term goal such as a driver’s licence and helping their family members with homework).

For Maori (Kempton, 2005) and Pasifika learners (Gibbs, 2005; Workbase, 2003a), being able to link into whanau and cultural ideals is clearly important for motivation. Wanting to be able to help their children’s education is a strong motivator for Maori, Pasifika, refugee and family literacy programmes (Benseman & Sutton, 2005;

Kempton, 2005; May, Hill, & Donaghy, 2004; McDermott, 2004). Levels of motivation among refugees are reported as especially high (McDermott, 2004).

In workplace programmes, motivation is reported as high and can be related to work (pay rises and promotions, coping with increased demands, greater job security, avoiding reliance on workmates), as well as personal goals (Skill New Zealand, 2002b).

The level of motivation can obviously vary from learner to learner, even within the same programme (Benseman & Tobias, 2003; Kempton, 2005; McDermott, 2004), but there are indications that older learners tend to be more motivated than younger learners. The international literature review of learner motivation (Watson, Miller, & Bowen, 2006) carried out for the MSD covered a selection of the research on this topic. In broad terms, the review reported similar findings to those discussed above.

The perspectives and motivations of LLN non-participants have not been researched in New Zealand.²¹

Our research has paid very little attention to the learners' perspectives in literacy, to find out more about what they want, how they perceive LLN and the services they receive—an aspect that has been missing in research to date (Quigley, 2005). Including learners' perspectives is important in keeping with the ethos of LLN practice and would add to the richness and authenticity of research.

Recruitment

Recruitment findings tell us what is effective in actually bringing learners into programmes, which may be more practical than studying learner motivation. Identifying successful recruitment strategies is useful to policy-makers, as it can inform how to resource 'what works' when trying to diversify or change patterns of participation. In New Zealand, learner recruitment has largely been the responsibility of providers, although a recent pilot programme in the Far North and Porirua (TEC Monitoring and Evaluation Team, 2005) has demonstrated the viability of generic, community-based recruiting offices that could include LLN services in their databases.

Community respondents in the Wanganui project (Comrie et al., 2006) had a low level of awareness about adult LLN issues generally in their community and limited knowledge about how to access services for those who need them. A similar position was found with employers (Franklin et al., 2005; Schick, 2005). This lack of public awareness puts the onus on LLN providers to recruit learners themselves. As the participation discussion above shows, providers appear to be reasonably successful in recruiting LLN learners, including significant proportions of those from high-need groups.

Recruitment of LLN learners is always going to be challenging. Programmes are trying to attract people with low skills who are often wary of (or hostile to) formal education. About a third of the general Adult Literacy Pool programmes had difficulties in recruiting learners for their programmes (Roorda, van Wichen Miller, Watson, & Poppelwell, 2005). The Manukau Family Literacy Programme had difficulty recruiting also in its initial phases (Benseman, 2002, 2003b). Recruitment problems are exacerbated when there is poorly-targeted publicity, difficult

²¹ The Wanganui project incorporated a study of 'non-participants' (Comrie, M., E. Tilley, et al. (2006), but it did not assess whether the respondents actually had LLN needs, which would be expected in order to classify the respondents as 'LLN non-participants'.

timeframes, coordination problems within the organisations, a lack of awareness in the community and social stigma around LLN.

Many of the Funding Pool evaluations did not have random sampling of programmes and didn't follow up on the less successful programmes, so recruitment may be a bigger issue than is shown in the present studies. This is of concern because the Foundation Learning Pool is such an important vehicle for increasing the quality and quantity of high quality intensive foundation learning opportunities, and programmes need to recruit as effectively as possible.

There is very little in the reports reviewed about how the providers carried out their learner recruitment. Pro-active strategies such as 'shoulder-tapping' by staff were the best way to recruit learners to the Manukau Family Literacy programme (Benseman & Sutton, 2005), rather than more traditional passive recruitment strategies like media advertising. This finding is consistent with best-practice adult literacy recruitment findings in the UK (McGivney, 2000). Workplace programmes used a range of strategies, including fliers on notice-boards and management presentations, although there is no indication of which of these worked best (Skill New Zealand, 2002b).

Having key Pacific individuals initiate and run programmes (especially through churches and schools) facilitated the involvement of Pasifika learners (Gibbs, 2005; Workbase, 2001b). Kempton (2005) reported that providing culturally responsive programmes that incorporate tino rangatiratanga (self-determination), taonga tuku iho (validating and legitimating Maori aspiration), ako Maori (culturally preferred pedagogy) and kia piki ake i nga raruraru o te kainga (support of learners) helps recruit and retain Maori learners. Two studies showed the value of having bilingual teachers available for ESOL classes, especially in the early stages (McDermott, 2004; Shameem, McDermott, Blaker, & Carryer, 2002).

Several reports (Castalia Strategic Advisors, 2005; Ministry of Education, 2003b) showed that distance programmes are able to successfully recruit LLN learners.

Many LLN learners have had adverse experiences in their schooling and are consequently apprehensive that their experience as tertiary learners will be similar (Benseman & Tobias, 2003). Yet, there was also evidence from family literacy programmes that these types of experiences do not necessarily deter learners even when programmes are sited on school premises (Benseman, 2002, 2003b, 2004b).

Persistence

Determining persistence in LLN programmes is complex because learners are often not enrolled in formal qualification-focused programmes. Recent tertiary education policies have placed increasing emphasis on the successful retention of learners through to completion of programmes and their qualifications. Completion of formal qualifications at low levels of the NQF is poor and when it does happen, it often takes learners a long time (Scott, 2004).

Reported data on persistence in the LLN programmes covered by this review is variable. While some providers self-report high attendance rates (100 percent over a sustained period), these figures are not verifiable and contradict the more common experience that LLN learners with complex needs and stresses in their lives often have attendance issues. The review of the Adult Literacy Learning Pool programmes (Roorda, van Wichen Miller, Watson, & Poppelwell, 2005) showed that poor attendance was the number one issue for the providers. Roorda et al were not able

to report on 19 of the 52 programmes funded because of reporting difficulties with them, so it is probable that this issue is more widespread. In contrast, in the Workplace Literacy Fund evaluation (Skill New Zealand, 2002b), dropping out of programmes was reported to be mainly due to changing jobs or leaving the employer, rather than dissatisfaction with the programme.

Adult learners have other obligations to be balanced alongside LLN study. Gibbs (2005) points out that, for Pasifika, priority is always given to family, cultural and community events over LLN participation. Flexible provision is an important feature of programmes that retain ESOL learners (McDermott, 2004) and computer-based programmes can help maintain learner interest in programmes (Te Haeata Education Training Services, 2004).

In the US, considerable work has been done to research strategies to retain LLN learners (Comings, Garner, & Smith, 2007; Comings, Parrella, & Soricone, 1999, 2000) that would be useful to consider.

It would be useful to research learner recruitment, retention and attendance patterns. The data and analyses available to date on these topics are patchy and not studied systematically.

With moves to encourage greater intensity and duration of provision, understanding patterns of participation and the extent to which learners are able to make use of the maximum hours available to them will be useful.

Research needs to incorporate more of the voices and perspectives of learners, to find out more about what they want, how they perceive LLN and the services they receive.

Section D—Information to inform future developments

Quality research findings and programme data are needed to inform policy makers and to underpin developments in foundation learning. This section presents the small amount of information currently available on the economic outcomes of foundation learning programmes and then briefly considers how researchers might improve the measurement of increases in LLN skills. Next, we reflect on the extent to which findings from the research programme have influenced developments, followed by a discussion of ways to improve future research.

Measuring longer term economic outcomes

This synthesis aimed to examine, where available, the range of outcomes for learners and employers. The programme evaluations covered in this synthesis report a range of outcomes for learners including improvements in LLN skills, achieving course or NQF credits or completing courses, and increases in personal confidence that can lead to changes in literacy behaviours. There was, however, little information on other outcomes for learners, such as employment outcomes or changes in earnings, and with the exception of two ROI studies, little information on economic outcomes for employers. This lack of economic information is also common overseas (Ananiadou, Jenkins, & Wolf, 2003). A New Zealand Treasury review of the international literature on adult literacy and economic growth (Johnston, 2004) found that while there was clear evidence of the benefits of literacy—people with better literacy are more likely to be employed and to earn more—there was little evidence of the benefits of foundation learning programmes or of the costs of those programmes.

The Lifeworks ROI study (Castalia Strategic Advisors, 2005) concluded a value of \$4.20 for every dollar of cost for the course (compared with a return of \$2.08 for a degree course). This analysis has been challenged by the independent reviewer, Dr Tim Maloney. The study did not gather empirical data but modified findings from an earlier study on the returns from general school and tertiary qualifications. Maloney did not think there was a reasonable basis 'for judging the appropriateness of the substantial adjustments that are needed to convert rates of return on classroom-based training to the likely returns on a specific extramural programme delivered to a very different population.' He suggested the study should have examined the estimated rates of return from similar foundation-level courses delivered elsewhere through a thorough literature review. He also recommended appropriate empirical work, including collecting extensive data on the experiences of participants both before and after the programme, and producing a reasonable comparison or control group.

The City of Manukau Education Trust (COMET) which developed the Manukau Family Literacy Programme also commissioned an ROI study (Price Waterhouse Coopers, 2006) to complement previous evaluations. The study calculated that for every dollar spent on funding the programme, there is a \$9.41 return over a staggered period of 30 years (primarily from increases in the adult participants' incomes). The independent review by Dr Perry agreed that an appropriate model was used, but challenged the robustness of the results. He argued that the study unrealistically projected 30 years out from programme data taken from too short a time span. Data was collected for only the year prior and the year after the programme. Also, the projections were based on labour-market income estimates for people who were still in education at the time of the data collection. The income estimates failed to take into account that post-education income performance is moderated by socio-economic background, and the study did not take into account the heterogeneity of the sample and its small size.

Both of these reports were commissioned and funded by the programme providers, rather than any government agency—as we understand it, largely as a strategy to provide proof of the economic value of the programmes that they provide. While both organisations are to be commended for their initiative, the reviews of both studies do seriously challenge the validity of their methodologies. This challenge is not surprising, given the particular difficulties in conducting ROIs, and it also probably reflects the limited funding available for doing these studies.

The other ROI-related research was the project carried out by Workbase (Workbase, 2004b), where providers were taught how to carry out ROI analyses as part of their selling workplace LLN programmes to companies. The results from this project again point to the difficulties in doing these analyses. While the report does not detail how the providers were taught to do these analyses, it is unlikely that they are as sophisticated as those reviewed above. Workbase certainly point out that the less-resourced, marginal providers in their project were not in a good position to do any analysis related to return on investment.

ROI studies should be carried out by experienced economic researchers and involve empirical data collecting, as inadequate or incorrect methodologies readily reduce the validity of the findings. These studies are complex and time-consuming, so they should be focused on specific areas of provision that are of major importance, and should be of a scale that the results can be generalised to much wider audiences. The Upskilling Partnership project is including an ROI component. Empirical data is being collected from a number of companies and LLN programmes; early data will be available in 2008.

Improving the measurement of learner gain

The quantitative data on learner gain varied in quality. There are a number of complicating factors when trying to use change in test scores to claim that a teaching programme has had an effect—the type of measurement instruments used to detect learning performance, the nature of causality, and the quality of reporting. Dr Gavin Brown made a number of technical recommendations in Appendix A that are worthy of consideration by any researchers undertaking measurements of learner gain, including:

- Researchers should use independent measures of learning (rather than self report by learners or providers) to demonstrate the effect of a programme.
- The psychometric properties of any measure of learning should be ascertained and used in evaluating learning gains.
- Appropriate statistics must be used when comparing performances of a group across two or more times.
- Measures of statistical significance must be reported with measures of practical significance.
- Multiple measures of learning (for example, test, observation, self-report) are desirable and should be evaluated in a complementary fashion.
- Threats to the claim that the programme has caused learning gains need to be identified and addressed either in the design of the intervention or afterwards in the analysis of results.

Researchers need to carry out different and more rigorous analysis of learner gain data, particularly effect size analysis, and present their methodology and data more fully.

Studies need to increase the use of random samples and ensure that unsuccessful programmes or learners who drop out are included. Many of the studies reviewed have looked for 'success stories', which has probably skewed the picture of provision. Larger sampling will increase the likelihood of the generalisability of findings. Studies also need to use more rigorous quantitative analyses that are reported in full.

Analysis of data and descriptions of programmes and providers need to use appropriate comparisons. Understanding the similarities and differences between providers and programmes that operated under similar funding and reporting regimes would be more helpful than studies with undifferentiated findings. Groupings might include funding streams, purposes of programmes, numbers of learners, differences in intensity and duration.

Using research and evaluation findings

Substantial research into foundation learning really only began in New Zealand in 2003, so the evidence base is still small, although the number of studies has increased and their quality has improved since the first review of LLN research in 2003. As the reviews by Brown, Maloney and Perry have demonstrated, there is still some way to go to improve both the amount and quality of quantitative data that comes out of research in the sector.

The extent to which research has influenced practice is hard to quantify, but appears to be growing. Findings from the literature review on effective teaching and learning have influenced the focus on the Learning for Living clusters on reading and numeracy. The findings from the review have also influenced the TEC funding regime which now looks to providers for programmes that are 100 hours or more duration. The investment in Learning for Living has been substantial, but the project and related research is not complete and the research studies are not yet public. The resource for teachers that is to come out of that project will be an important tool for the sector.

Monitoring reports for programmes funded by the Foundation Learning Pool and Workplace Literacy Fund are designed for individual provider compliance purposes, but do not appear to be used more widely at the moment. There has not been any published information on the extent to which the funds have influenced long-term provider capacity to deliver programmes of better quality to greater number of learners. The Workplace Literacy Fund is being evaluated currently, including data analysis of applications during 2006 and interviews with companies and providers.

More in-depth and timely analysis of monitoring reports from the Foundation Learning Pool and the Workplace Literacy Fund may provide information on how provision is increasing, diversifying and building on what has gone before.

Future research topics

A long-term research plan for the next five years, involving all agencies, would provide a longer perspective on foundation learning development and ensure a more coherent and co-ordinated approach.

Funding will never be sufficient to cover the full range of issues and developments worthy of research in New Zealand, but we can look to the high-quality research (particularly from large studies) that is being produced by overseas research centres for useful and relevant information. Some results may be directly applicable,

particularly around teaching and learning. But there are also important research topics that cannot be answered from overseas research, including:

- a survey of LLN providers and teachers including understanding the mix of provision in regions
- Pasifika learners and provision; how to recruit them, how to ensure they stay in provision and are successful
- integrated provision - how to be sure that the model currently in use ensures literacy gain for learners
- recruitment, retention and attendance patterns of LLN learners
- follow-up of non-successful programmes/learners
- teaching quality strategies including formative assessment and the influence of PD on changing teachers' teaching behaviours
- web-based self-study learning programmes to offer provision to those people who want to brush up skills or to keep learning in breaks from formal study
- measuring the impact of the new adult literacy educator qualifications on LLN teachers and their professional development
- development of a reporting tool on confidence and changes in LLN practices for providers to use in their evaluations
- further case studies of workplace provision that address employer concerns.

These topics are listed in more detail in the executive summary.

Improving methodology

The research methodologies used in foundation learning could be improved and the quality and rigour of the findings enhanced in a number of ways:

- Increasing the use of random samples and ensuring that unsuccessful programmes or learners who drop out are included. Many of the studies reviewed have looked for 'success stories', which has probably skewed the picture of provision. Larger samples will increase the likelihood of the generalisability of findings.
- Describing and analysing programmes and providers using appropriate comparisons. Understanding the similarities and differences between providers and programmes that operated under similar funding and reporting regimes would be more helpful than studies with undifferentiated findings. Groupings might include funding streams, purposes of programmes, numbers of learners, differences in intensity and duration.
- More rigorous quantitative analyses that are reported in full.
- More complete reporting of data and methodology in all studies. Shorter reports for more general distribution are useful but they are not a substitute for full reports. Both need to be available.
- Ensuring the early involvement of return on investment specialists in the planning of major initiatives.

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APPENDIX A: ISSUES IN STATISTICAL MEASUREMENT OF LEARNER GAIN

General issues in evaluating learner gain

In claiming effect on learning, researchers examine measurements of relevant learning, usually before and after the implementation of a teaching innovation or program. It is assumed that if a program is effective, its effect can be detected in the measurements of learning. However, there are a number of complicating issues when trying to use change in test scores to claim effect. These include the type of measurement instruments used to detect learning performance, the nature of causality, and the quality of reporting. Each of these major categories is addressed in turn, so that the reader can make sense of the analyses. It is also hoped that these analyses will help future researchers conduct and report their research in such a way as to better claim effectiveness of programs.

Characteristics of measurements

When researchers use test scores to claim that learning gains are real, there are a number of well-established characteristics of instruments which can threaten our ability to claim that gain has actually occurred. The reliability or accuracy of a score is founded on certain key assumptions—the score one gets on a test is an estimate of one's true ability for that test—the more closely the observed score estimates one's true ability the more accurate and reliable the instrument is that generated the score.

First, it should be noted that instruments that measure learning are never perfectly reliable. Thus, indications of the degree of accuracy are needed to better ascertain whether the differences in performance exceed the natural variability of scores due to unreliability of the measure. For example, the consistency of test questions or items to each other (i.e., internal consistency) can be determined by various procedures, most robust of which is Cronbach's alpha. Another important statistic for indicating the accuracy of a test score is the standard error of measurement (SEM), which provides the range of observed scores in which a person's true score is thought to lie and a statistical confidence level for the range. For example, an observed test score of 15 with a SEM of 4 provides a 68% confidence interval of 11 to 19; that is, two out of three times the person's observed score will fall in that 8 point range. To obtain increasing confidence (e.g., 95% and 99%), we increase the range either side of the observed score by another 1 and 2 SEM, meaning that to be 99% sure of the person's true score we would claim in our example that the range is 3 to 27—a very large range indeed. Scores that do not differ by more than at least 1 SEM are considered not to be different by anything more than chance. Thus it is important to ascertain the degree of reliability within any set of test scores and make use of that information in making sense of the score differences.

Second, instruments tend to produce the most accurate estimates of performance around the mean score. Also, tests generally have fixed ranges of difficulty in them. Students who are near the top range of the test may not receive accurate estimates of their performance because of few items assessing their actual ability. Furthermore, the test may not be able to show gains in learning because of the ceiling effect of the test. Likewise, students for whom the

test was too difficult may not receive accurate estimates of performance if their actual ability is below the threshold of the test. Likewise, such students may not be able to show any learning gain, because of the floor effect of the measure. Thus it is important to ensure that measures are able to measure accurately the full range of actual abilities exhibited by the learners.

Third, many standardised tests report norm referenced scores such as percentile or stanine. These statistics are non-parametric and thus arithmetic operations cannot be applied to them. That means rank order scores (e.g., 35th percentile--position in 100) cannot be averaged with another rank order score (e.g., 53rd percentile to give 44th percentile). Thus, rank order scores are not suitable for determining size of learning gain. Scores must be on an objectively-defined continuous or interval scale, so that parametric operations (i.e., average) can be conducted.

Fourth, measures that require human judgement for assigning scores (i.e., ratings using a scoring guide like Olympic judging) are usually much less reliable because of human variability effects. Humans differ in time with themselves and between each other. Special procedures (e.g., inter-rater reliability) need to be put into place to demonstrate the degree to which the judges agree with each other. For high-stakes consequences such as claiming a real learning effect for a program the minimum statistic for inter-rater reliability should be .70 as this means that the agreement between raters accounts for 49% of variance in scores. Ideally, inter-rater reliability should be at least .90, a very difficult standard to attain. With such a measure, it is possible to estimate the SEM of the instrument, and thus determine whether the change in scores exceeds the unreliability of the instrument.

Fifth, when test scores are reported as bands or categories, there is always a problem with learners whose scores lie either side of the boundary of those categories. The score value that separates one category from another is called the cut-score. It may well be that a very small score change (perhaps due to the unreliability of the measure discussed above) can result in a change of score category for all students just below or above the level cut-score. Thus gains of a level may not represent anything more than chance variation. Thus, estimates of test reliability are needed to determine whether the actual score gain is more than chance variation due to unreliability. Researchers should resist the temptation to consider that a gain in level is meaningful without first eliminating the possibility that the level gain happened due to the unreliability of the test measure.

Considering alternative explanations

If we can confidently claim that the difference in scores exceeds the amount attributable to the measurement error, there are still a significant number of processes in reality that may prevent us from claiming with confidence that the program is responsible for the change in scores. These are classically described as rival or alternative explanations for the difference in scores. Unless procedures are put in place to eliminate or take account of these confounding alternatives, the researcher and reader must always allow for the possibility that something other than the program is responsible for the difference.

First, learning happens anyway due to the passage of time in which learners mature or develop; not much successful teaching needs to happen for learners to get better. Practice at the test will raise scores without necessarily raising learning. Exposure to experiences, people, or events outside the program may

cause learning. Thus, we need to be able to confidently claim that the gain is more than occurs naturally without this intervention. Knowing that the gain is larger than chance (that is more than the unreliability of the measurement tools) does not establish the size or meaning of the gain. Fundamentally we need to know how much learning occurs naturally without the introduction of the program as a point of comparison.

There are a number of ways to create a comparison group as a way of ensuring that factors outside the program were not responsible for the change in learning. The traditional approach is the experimental model in which learners are assigned randomly to two groups one of which gets the program and the other not. Usually, control groups of equivalent ability are established at the onset of an intervention. However, this randomised control trial model is often considered ethically difficult or impractical to implement (perhaps because of small numbers involved). Thus, other approaches have been developed to establish a comparison point.

If the instrument being used is a standardised published test there will be established norms for similar learners that can be used as a comparison point. If the gain is no more than that occurring for the norm population in the same time period, then the program can not claim a unique additional effect. If norms for the instrument do not exist, it is possible to compare the amount of difference to that seen in other educational interventions or treatment programs.

Researchers and readers should not confuse tests of statistical significance with measures of amount of difference. Statistical significance simply indicates that the change in test scores is such that it is highly unlikely to have occurred by chance. A small change can be beyond chance when large sample sizes are used. Thus, tests of statistical significance alone are insufficient to determine the merit or worth of a change phenomenon. To repeat, statistical significance does not mean large—it means not due to chance. An indication of the practical significance is needed when evaluating gain scores. The established measure for indicating practical significance is the effect size.

Professor John Hattie's meta-analysis of education interventions indicates that an effect size of .40 is the average for all educational interventions. Professor Cohen's standards for effect sizes indicate that effects greater than .80 are large, while those smaller than .20 are trivially small. Effect sizes adjust the amount of difference in scores to a common metric of proportion of standard deviation (SD). A difference of 1.0 SD is a large noticeable difference indicating that 85% of students made a noticeable gain, whereas a gain of .30 SD is barely noticeable. Cohen describes effect size of .30 as equivalent to the difference in heights of 13 and 14 year old girls, while an effect of 1.0 is about equivalent to the difference in heights of 13 and 18 year old girls.

It should be noted that these values apply to all programs regardless of whether they are for school-age or adult learners. Thus, it is possible to meaningfully interpret learning gains by calculating the effect size between the two sets of scores. Effects greater than .40 are to be pursued and those greater than .80 are to highly prized. However, it should be borne in mind that if a program is effective it should produce an effect larger than that seen in naturally occurring development; thus, if learners gain .40 each year, a program that produces an effect of .30 in half a year, may well be on track to substantial, additional effectiveness over the longer period of time.

Second, learning gains do not necessarily happen equally across the distribution of ability. Gains at the mean may be quite different to those at the tails (very low or very high) of the distribution. Low and high scoring students are highly likely to get scores much closer to the mean upon a subsequent administration of a test because of a phenomenon known as regression to the mean. For example, the children of very intelligent parents are more likely to have lower rather than higher intelligence because real world processes tend towards the average. Thus, if the sample being tested is initially skewed towards the lower end of the score spectrum, large gains may occur through regression to mean rather than through actual learning. The effect size statistic, by taking into account the change of variance in the distribution of scores, helps eliminate regression to the mean as a causal explanation.

Third, not all participants complete an intervention program and are tested at both times. Those not completing may be significantly different in important ways than those who complete. Those staying in a program may have significantly different motivations, goals, and may have quite different starting abilities—it is not difficult to imagine that those who stay were closer to the program goal than those who dropped out. Researchers should seek to establish that the completing and non-completing groups were statistically similar at the start of the program so that it can be legitimately argued that the program works equally well for all candidates. If the completion and non-completion groups start differently, researchers have to be more cautious in their claims of generalisability for the program. Perhaps, the program is only effective for the type of people who match the completing participants.

Fourth, participation in a program suggests a very positive attitude towards and commitment towards the goals, values, and methods of the program. The learners, the instructors, researchers, and even policy innovators who support and participate in a program are probably inclined to feel very positive about the effect of the program. For example, consumers who buy a fuel additive will often claim there is a positive effect on fuel efficiency even though scientific tests can demonstrate that the additive does nothing. Furthermore, as learners and instructors develop positive relationships with each other, their attitude will generally become more positive towards the program. These processes generate a halo effect and limit the meaningfulness of self-reported attitudes as a measure of effectiveness. Feeling positive about the program may not be associated with actual program effectiveness. Objective measures of learning are needed to establish the effect of the program.

Fifth, non-standardised presentation of assessments to students can result in artificially depressed or even elevated scores. Lower scores may occur where procedures permit assessors to not present items if they judge, based on their limited knowledge, the learner cannot do the assessment. Non-presentation may remove opportunity to exhibit ability because the assessor is using non-construct relevant criteria to determine that the item should not be presented. Elevated score may occur if the assessor gives credit to responses that do not actually meet the established criteria or if the assessor assumes the learner can do the items and thus does not present them to the learner. Thus, initial scores based on human judging are prone to higher degrees of error. Researchers should provide training and conduct moderation of administration and scoring so that they can ensure readers that the scores are a valid representation of learner performance.

Sixth, one-on-one individual interview type assessments mean that the learner's ability to read or write is not influencing negatively their ability to exhibit their learning. However, such procedures may be influenced by the power relations between teacher/assessor and learner. For example, learners may believe that responding to teachers requires a certain style of behaviour (e.g., eyes downcast, deference to teacher), while many instructors have developed patterns of not waiting for learners to respond. Thus, when assessors and learners do not know each other well, learners may apparently under-perform because of differing expectations as to how instructors and learners should relate to each other. Furthermore, learners may be unfamiliar with the assessment task or may even believe that the assessor really has the learner's best interests in mind. Consider the evidence of Te Kotahitanga Project which showed that students and teachers had very different perceptions of the power relations between them. Thus, in such novel cross-cultural situations, initial ratings may not be accurate estimates of learning. As learners get to know educational processes and instructors, scores may raise without implying that learners have actually learned more. An increase in confidence should not be equated with an increase in learning. Increases in confidence may be due to familiarity and not the program—and any program may generate such gains.

Standards and conventions for reporting gain

Having identified common threats to meaningful interpretation of learning gains, it is necessary to establish common standards and conventions for reporting gains in assessed learning. These standards assist readers in evaluating causal claims that the program is responsible for learning gains. All researchers should seek to follow the 2006 *AERA Standards for Reporting on Empirical Social Science Research* (http://www.aera.net/uploadedFiles/Opportunities/StandardsforReportingEmpiricalSocialScience_PDF.pdf).

- In quantitative social science research it is vital to report measures of central tendency (e.g., mean) and measures of variation (e.g., standard deviation) for all continuous variables. For categorical variables, tables of frequencies are required. Readers need to know how close most people are the middle point — is the mean or mode a good estimate of most people's score?
- As indicated above, in addition to measures of statistical significance, the practical significance of any differences must be established—preferably through an effect size measure.
- Use of an instrument should always provide evidence for its valid use by reference to the psychometric properties of the instrument. This normally means providing data as to the internal consistency, factor structure, and standard error of measurement for total and scale scores. Researchers have an obligation to expose the measurement characteristics of the tools being used and interpret results in light of those characteristics.
- Researchers must seek to portray their data in an appropriate and honest fashion. It is tempting to leave out data that does not present a gain in a positive light. For example, stretching the vertical scale can make small gains appear large or leaving out students who made no gain or lost ground can make small gains look large. The use of language might suggest larger gains than are actually present. For example, 'significant' commonly suggests large or noticeable to the non-statistical reader. However, in the context of

statistics significant means “unlikely to be due to chance”. Thus significant non-chance results can be trivial in a practical sense.

It is hoped that this short primer on measuring learning gains helps researchers in adult foundation learning to design more robust studies and to conduct more powerful analysis of their results. It is also hoped that readers of research in adult foundation learning will be better able to make sense of the reports. It is up to all evaluators to be critically aware that there are threats to causal claims which must be addressed in the design and analysis of research and innovations. Once competing or alternative explanations are addressed, claims of effectiveness can be advanced in a robust fashion. It is also hoped that researchers will use these conventional and recommended standards in the design, conduct, and reporting of research so that there is more comparability of analysis across programs, such that the relative merits of various programs can be established. Researchers and readers interested in furthering their understanding in this field are recommended to consult one of the many standard research methods text books and the AERA Standards on Reporting Empirical Social Science Research.

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