



Developing the skills of Māori farm employees in Te Tai Tokerau

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Executive summary

This report presents the findings of a research project for Ako Aotearoa, focused on the assessment of the workplace literacy (WPL) skills of Māori farm employees from five rurally isolated pastoral farms in Northland. The research was undertaken by Venture Group Ltd, in collaboration with the Agriculture ITO (AgITO), and with encouragement and some input from the Te Tai Tokerau office of Te Puni Kokiri (TPK), and the Retirement Commission, Wellington.

The research aims were to:

- investigate the workplace literacy skills levels and training needs of Māori farm employees on five rurally isolated farms
- explore practicable options for the delivery of training to meet those needs
- assess the effectiveness of two new self-assessment tools, purpose-designed to identify the financial and digital literacy skills training needs of modern agriculture employees.

There were three main drivers for this research project:

1. *AgITO commitment to lifting WPL skills of the agriculture sector:*

AgITO research shows that the agriculture sector's performance is constrained by a serious mismatch between sector-level requirements and human capital supply at farm enterprise level, where 60% of all land-based employees have literacy and numeracy skills levels below the level required by their work tasks.¹

2. *AgITO commitment to improving the performance of Māori agricultural entities:*

A priority of the 2008 Māori Land Training Strategy was to increase the number of industry-qualified Māori agriculture employees.² In 2010 just over 18% of 6,791 AgITO industry trainees were Māori, the majority of which are employed in rural regions with limited tertiary education provision and often poor broadband coverage. Māori agriculture makes a significant contribution to the economy of Te Tai Tokerau and is a major contributor to the region's only billion dollar industry sector. The region's Māori pastoral farms however, perform at about 65% of the profitability of non-Māori farms - a productivity gap which research suggests could be addressed through governance and other skills training.³

3. *Venture Group's aim to deliver WPL training to farms in Te Tai Tokerau:*

Since 2005 Venture Group has delivered WPL to construction, manufacturing, and residential care companies, mainly in Whangarei. Recent research conducted by Venture Group had highlighted a long-standing impasse between the realities of agriculture employment (seasonal hours, long distances from tertiary providers, and low workplace

¹ *Futures Research Annual Report 2009*, AgITO, p 4.

² AgITO in conjunction with Horticulture ITO, FITEC, Beef & Lamb NZ, DairyNZ, and key government agencies.

³ *Maori Farm Consultancy Guidelines* (2008), Sustainable Farming Fund, MAF. Source: <http://maxa.maf.govt.nz/sff/about-projects/search/L07-008/index.htm>

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literacy skill levels), and the pressing need for effective delivery of WPL training to pastoral farm employees in rural areas.⁴

The participants

Five farms from across Te Tai Tokerau agreed to participate in the project - a Māori trust farm, two Landcorp farms, and two owner-operated farms.⁵ The farm types covered dairy, dairy and dry stock, and sheep and beef operations.

Between them the farms employed 31 farm employees and four of the five farms employed both Māori and Pakeha farm employees. Farm managers were informed that the WPL research and WPL training would focus on Māori farm employees. WPL assessments would be open to Pakeha employees but any subsequent training for them would be contingent upon separate funding. The farm managers agreed to this approach.

Just as the research got underway, TPK's offer of funding to cover the travel costs associated with delivering WPL training to Māori farm employees was withdrawn due to budget cuts. This meant that the project's WPL delivery component had to be dropped.

The farm managers however, were happy to proceed with the reduced project and arranged on-site, work-hours meetings so that the researcher could meet their employees to explain the research, and to invite their participation in the research.

Twenty eight employees volunteered – 17 of 17 Māori employees and 11 of 14 Pakeha employees. The 17 Māori employees (the 'participants'), included only one female but represented a fairly even spread in terms of:

- age (16 to 58 years - median 39 years)
- duration of employment on their farm (from 2 weeks to 32 years – median 6 years)
- job positions (two managers, six operations managers, seven farm assistants, and two trainees).

Ten of the 17 participants had completed in-house or other farm related training (e.g. Landcorp in-house training, GrowSafe, Motorbike Safety). Two had completed AgITO Level 3 qualifications, one had completed an AgITO Level 4 qualification, and two trainees in their late teens were currently enrolled as AgITO Modern Apprentices (Level 3).⁶

⁴ *Increasing the Performance of Farm SMEs in Northland* (2011), unpublished. DOL Workplace Productivity project over 18 months to improve workplace management and practices as drivers of SME workplace productivity.

⁵ The farms were located in Kaitaia, Kaikohe, Poroti, Parakao, and Helensville.

⁶ Refer to Appendix 2: Participant Characteristics, p 55.

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The 17 participants completed all four of the project's purpose-developed assessments for workplace literacy and numeracy, financial literacy, and digital literacy.⁷

The Assessment Results

The two workplace literacy and numeracy assessments were set at Step 6 of the National Adult Literacy Learning Progressions.⁸ Step 6 reflects the literacy and numeracy skill levels required to achieve AgITO Level 4 qualifications, and the literacy and numeracy skill requirements of the work tasks and responsibilities undertaken by the participants.

The financial self-assessment was adapted from tools from the 'sorted' website⁹ and on-farm discussions, and the digital self-assessment was based on AgITO's 2011 research findings in relation to communications, calculations, and computer/IT usage in the agriculture sector.

The assessment results were summarised as follows:

- Sixteen of the 17 participants demonstrated competence at Step 5-6 in the Learning Progression - 'Speak to Communicate'. The one participant who demonstrated competence at Step 4-5¹⁰ in this progression was a recent school leaver and appeared very shy and hesitant in responding to questions.
- Two participants were assessed at Step 5-6 in 'Listen to Understand'. Thirteen participants were assessed at Step 4-5 - they had gained the gist of the information given but did not have strong recall of key points. Two participants were assessed at Step 3-4.
- Step 6 skill levels are considered by AgITO to be required for successful completion of its Level 4 qualification. All participants were assessed as below Step 6 across the other five of 7 Learning Progressions: 'Read with Understanding', 'Write to Communicate', 'Make Sense of Number to solve Problems', 'Reason Statistically', and 'Measure and Interpret Shape and Space'.
- Thirteen participants were assessed as reading at below Step 5, and four at Steps 5 and 5-6.
- Eleven participants were assessed as writing at Step 3-4, and three at Step 4-5. Only three participants were assessed as writing at Step 5-6.

⁷ Five Pakeha completed three assessments, 6 Pakeha completed only the financial and digital literacy assessments. All 28 employees who completed assessments were offered feedback on their results.

⁸ Refer to Appendix 1: Summary of Literacy Learning Progressions, p. 54.

⁹ The Retirement Commission's website on managing personal finances in order to build retirement savings.

¹⁰ Skill level overlaps between different tasks are here represented by the inclusion of a 'bridging' Step between each of the official Progression Steps.

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- The reading and writing assessment results indicate that all participants are likely to be encountering performance difficulties to a greater or larger degree, and / or avoiding, some of the reading and writing tasks as required by their work roles.¹¹ They are likely to struggle with AgITO and other industry training qualifications.
- All participants demonstrated numeracy competency skills below Level 3, the level that the Ministry of Education considers necessary for adults to be able to function effectively in a modern workplace.¹²
- Only 8 participants assessed themselves as being able to explain 17 or more of the 23 common financial terms in the Financial Literacy self-assessment (four of 8 managers,¹³ and four of 9 farm assistants), and only 9 participants could explain half or more of the terms.
- Fifteen of 17 participants knew their personal financial status, but only 7 had a personal budget. Eleven participants (7 of who were managers) felt confident to discuss finances with their bank. Only three participants knew www.sorted.org.nz.
- Only three of 17 participants assessed themselves as confident users of digital technology. Seven participants could be categorised as having an introductory level of digital technology skills, and 7 as having both limited digital technology skills and limited access to digital technology.¹⁴ There was no correlation between the skills of digital literacy and job position.
- Thirteen of the 17 participants were keen to access computer-related training - setting up and using spread sheets, templates, and databases; accessing animal health, pastoral farming and meteorological websites, etc.¹⁵

The Research Findings:

1. All 17 participants could be expected to be constrained in their current work performance due to low levels of workplace literacy and numeracy.

¹¹ Reading and understanding technical and product use instructions, interpreting charts, plans, maps and other technical documents, writing reports, filling in record sheets, etc.

¹² Level 3 is a "suitable minimum for coping with the demands of everyday life and work in a complex, advanced society. It denotes roughly the skill level required for successful secondary school completion and college entry." (Ministry of Education: 2001b) quoted in *2010: The Social Report – Te Pūrongo Oranga Tangata 2010*, Ministry of Social Development, Wellington. Source: <http://socialreport.msd.govt.nz/notes-references/endnotes.html#n54>

¹³ 'Managers' in this context includes: Herd Manager, Stock Manager, and Manager – the management level below that of Farm Manager. Farm Assistants include all staff excluding Farm Managers and 'Managers'.

¹⁴ The majority of participants used cellphones for phonecalls or txts where coverage allowed.

¹⁵ Refer to Appendix 3: Summary of Assessment Results, p 56.

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2. All participants would benefit from workplace literacy and numeracy skills training to lift their reading, writing, and numeracy skill levels up to the levels required by their *current* work tasks and roles.
3. All participants could expect their current low literacy and numeracy skill levels to limit their chances of further career development in pastoral farming.
4. Participants who want or need to complete Level 3 or Level 4 AgITO qualifications will require WPL training to Step 6 in reading, writing and numeracy progressions, before they will be able to successfully tackle those qualifications.
5. Eleven participants are likely to benefit from training in financial skills related to personal money management skills as not one of the participants were able to explain all of the financial terms in the self-assessment.
6. All participants could be expected to benefit from digital literacy training, particularly as an aide to building reading, writing, numeracy and financial literacy.
7. The 13 participants who indicated an interest in computer training could expect to make significant learning gains within a short period from training which targets the use of digital tools and software programs to manipulate number information, and incorporates the records and reporting requirements of their work roles.
8. Productivity on the five farms could be expected to improve as participants' workplace literacy and numeracy training needs are progressively addressed.

Issues and challenges

Issues

The research findings raised some interesting issues:

1. For the wider agriculture industry and Māori pastoral sector in particular:

This research confirms that the literacy skill levels, broadly defined, of Māori farm employees in Te Tai Tokerau are below the levels required for them to progress higher level careers within the agriculture industry.¹⁶

The characteristics of the participating farms in terms of size, type and location; of the Māori farm employees in terms of age, AgITO qualifications, and job positions; and of the tasks and responsibilities listed in their Farm Job Profiles would all be largely replicated by those of Māori-owned pastoral farms and Māori farm employees in other rural regions.

2. For pastoral farm owners and farm managers:

WPL training to increase the effectiveness of communication between Māori farm staff and to improve the appropriate allocation by them of time and resource to specific farm tasks and processes can be expected to significantly lift farm productivity.¹⁷ An investment in WPL training that is fine-tuned to individual farm businesses (via a Company Profile), and staff roles (via a Farm Job Profile) can be expected to produce early and longer term gains such as increased Māori farm productivity, enhanced career development for Māori farm employees, and greater returns on Māori-owned pastoral farms.

3. For Māori farm employees wanting WPL training:

About 32% of the Northland population is Māori (compared to 14.6% nationally), and almost a third of the region's Māori workforce is employed in agriculture. Practical issues prevent many Māori farm employees from being able to easily access targeted workplace literacy training to improve their abilities and prospects. The research highlighted the difficulties associated with delivering training to Māori farm employees working on dispersed pastoral farms in isolated rural areas:

- A paucity of tertiary education workplace literacy training providers in rural regions.

¹⁶ Although not part of the research, the project also highlighted that the First Line Management skills of manager/supervisors, especially communication skills, fall below what is needed.

¹⁷ On-farm delivery of training in communications, policy and report writing, goal-setting and planning, use of digital technology lifted the performance of farm managers, streamlined farm operations, improved farm employment relations across six Northland farms in a DOL Workplace Productivity project run over 18 months to identify and address barriers to improving farm productivity. Venture Group Ltd for DOL (2011) *Increasing the Performance of Farm SMEs in Northland* (2011), unpublished.

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- The seasonal demands and long work days on farms, which along with distance from main centres, often make ACE learning options impracticable.
- Limited digital technology on farms, and low quality internet connections and cell phone coverage in many areas, which when combined with Māori farm employees' generally low levels of computer skills, limit online training options.
- The high travel costs associated with on-site, kanohi ki te kanohi delivery of individualised WPL training fall outside of TEC's WPL Fund's criteria.
- Practical difficulties around the logistics of releasing one or more farm employees from farm work during work hours to undertake on-site training.

4. For AgITO:

The research identified some specific barriers for AgITO trainee progression from Level 2-3 to Level 4 AgITO qualifications, through discussions with Māori trainees who were currently signed up for Level 3 qualifications and with older Māori farm employees who had dropped out of AgITO Level 4 training.

- The 'DKO' (demonstrate knowledge of) assessment process when used in entry-level vocational training can allow a trainee to progress through a Level 2-3 qualification without being required to demonstrate rigorous levels of literacy. Literacy and numeracy issues can go unnoticed by the farm manager or AgITO assessor, and therefore unaddressed, then emerge later as a barrier to progression to Level 3-4 qualifications.
- The step up from Level 2-3 qualifications to Level 4 is significant in terms of both the subject matter AND the level of literacy and numeracy that is required to complete assignments and tasks.
- Trainees experience a 'drop-off' in the level of support from AgITO at the same time that they are required to step up in academic performance. If trainees have undiagnosed literacy or numeracy issues, they are likely to drop out of training at this stage, rather than risk their employment by highlighting literacy training needs with their employer.

AgITO considers that trainees need to have skills at Step 5 level to be able to engage successfully with a Level 2 training programme. AgITO estimates are that 80% of farm workers are currently at Step 5 or lower in the Literacy Progressions. Based on the findings of this research into the WPL training needs of Māori farm employees in Te Tai Tokerau, many are likely to be considerably below Step 5.

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Several of the Māori participants in this research had been enrolled in training towards Level 4 AgITO qualifications (e.g. Production Management). Their literacy skill levels however, were at Step 2-4 in the literacy and numeracy progressions. Unsurprisingly, they expressed frustration and lack of motivation as they struggled to deal with the literacy demands of a Level 4 qualification. Their 'Progression Challenge' then is on two fronts: in terms of the Literacy Progressions themselves; and in terms of the challenges Māori trainees face when trying to progress between qualification levels.

The research findings are a bleak confirmation that the WPL skill levels of many Māori employees in Northland's dairy sector are well below the skill levels that DairyNZ (2011) described as urgently required for the future.

Challenges

Three main challenges related to skills development for Māori farm employee in Te Tai Tokerau need to be addressed:

1. The identification of WPL delivery options which bypass the current barriers around access and cost in relation to Māori farm employees in isolated rural areas, so that they can lift their WPL skill levels to the level required by their current work roles.
2. The fine-tuning of the literacy and numeracy subject content and skill level requirements across the suite of AgITO and other agriculture industry qualifications to support WPL skills development and progression between qualifications.
3. Individualised WPL training for Māori farm employees across all levels of AgITO training, to equip them to:
 - enhance their security of tenure in their farm jobs
 - lift their qualification enrolment and completion rates
 - improve their pastoral career and promotion opportunities, and
 - contribute at a higher skill level towards lifting productivity on Māori-owned farms.

Post-Research WPL Training Trial

The delivery component of the original research project had to be dropped from the project due to TPK funding cuts as described earlier.

In 2012 Venture Group met with Landcorp's national office to discuss the research findings. The office checked with the Māori farm employees from its Kaikohe farm who had participated in the research. They expressed an interest in accessing the WPL training to meet the needs that had been identified through the research assessment process, so Landcorp contracted Venture Group to deliver that training.

Venture Group's WPL Manager travels to Kaikohe one day a week to work with three Māori employees (including two of the original research participants from this farm) and one Pakeha employee.¹⁸ Landcorp is treating the WPL delivery as a pilot, and will consider the report due at the completion of the WPL delivery contract in relation to the possible expansion of the pilot to other Landcorp farms in the future.

Landcorp at a national and local level then is still actively supporting the aims of the original research project, and enabling the completion of its WPL delivery component through direct funding.

¹⁸ Two other Māori research participants had left in the interim for employment in Australia.

Introduction

Agriculture and Pastoral Farming

New Zealand's role as an agriculture producer is underwritten by its vast agricultural landscape and reputation as an exporter of high quality food and wool products. Agriculture is its lead industry and produces almost 60% of total national exports. In 2011 the agricultural sector had 14.5 million hectares under agricultural production, and employed about 11% of the New Zealand workforce, or approximately 114,000 people, across a range of agricultural activities.¹⁹

Pastoral livestock farming is the dominant agricultural land use with 197,000 hectares in sheep and beef production and 14,710 in dairying. In 2011, dairy exports totalled \$13.2 billion, representing more than half of total agriculture exports and a full 95% of the total dairy production from a national stock of 4.8 million dairy cows. Lamb and beef products, the country's second largest export, were sourced from national stocks of 31 million sheep and 3.8 million beef cattle.²⁰

Literacy skill gaps in the agriculture sector

The Agriculture ITO (AgITO) has responsibility for planning the delivery of industry skills training to meet the current and future needs of the agriculture sector.

AgITO research shows that there is significant demand for highly trained workers as the wider agriculture sector's performance is constrained by a serious mismatch between sector-level requirements and human capital supply at the farm enterprise level. Few tertiary graduates choose farming as a career yet the size and complexity of modern farm businesses mean that employers increasingly require tertiary-qualified, multi-skilled staff.

Initial research by AgITO showed that 60% of all land-based employees in the wider agriculture sector had literacy and numeracy skills levels below the level required by their work tasks.²¹ This finding was disconcerting on several counts, not least the safety of farm employees working with hazardous substances, but also suggested a contributing cause to the low completion rates of AgITO national qualifications for the agriculture sector.²²

International surveys of adult literacy, language and numeracy in Aotearoa New Zealand since 1996 have identified a large cohort of people with low literacy and numeracy skills. In 2006 the

¹⁹ Agriculture Industry Profile 2011. Careersnz. <http://www.careers.govt.nz/default.aspx?id0=10104&id1=0311121F-9724-423D-A4DD-845E7ACB9E97>

²⁰ Breeding stock only. <http://www.mpi.govt.nz/agriculture/statistics-forecasting/international-trade.aspx>

²¹ *Futures Research Annual Report 2009*, AgITO, p 4.

²² In 2006-2009, excluding Modern Apprentices, AgITO trainees had a qualification completion rate of just under 10%, while 35% of trainees achieved a low number of credits, and 30% achieved no credits.

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Ministry of Education (MOE) stated that the literacy and numeracy skill levels of over 40% of all New Zealand adults were below Level 3 and could be expected to significantly limit their participation in a knowledge-based economy.

Of even more concern is that between 60 – 75% of the adult Maori population had literacy and numeracy skill levels that were below Level 3.²³ In 2010 just over 18% of 6,791 AgITO industry trainees were Māori.

In 2011 AgITO undertook further research to see how the results of international adult literacy research surveys of New Zealand adults applied to the agriculture sector. The 1996 International Adult Literacy Survey (IALS) and the 2006 Adult Literacy and Life Skills Survey (ALL) showed that at least 40% of all New Zealand adults, and 60–75% of all Māori adults, had low skill levels in adult literacy, language and numeracy skills, and that these could be expected to significantly limit their participation in a knowledge-based economy.

AgITO found that that over 40% of the agriculture sector workforce had skill levels in the fields of communications (speaking, listening, reading, and writing), calculations, and computing/IT that were below those required for the effective management and operation of modern agriculture businesses.²⁴

This WPL skills gap presents a real challenge to an agriculture sector under considerable pressure to increase productivity.²⁵

Māori in Pastoral Farming

The majority of Māori-owned agricultural land in Aotearoa New Zealand is in rural and often isolated areas. Through the sometimes parallel processes of negotiated land sales, land confiscations by the Crown, and Māori Land Court and other legislation designed to 'free up' Māori land for settlement by immigrants from Europe, almost 95% of traditionally-held Māori land was alienated from Māori ownership within the space of one hundred years.

Only 1.5 million hectares remain in Māori title and of the 1.21 million hectares of Māori-owned land in agricultural use, only 3% can be classified as high quality agricultural land that is suitable for multiple and intensive land uses. About 86% of Māori land is instead suited only for pastoral use, or for extended grazing and forestry, and located in the more isolated rural areas.

²³ Attainment of Level 3 or higher numeracy skills by Māori adult learners was about half the rate of non-Maori adults.

²⁴ *Ag TALK Northland and Waikato*, AgITO, April 2011.

²⁵ The AgITO Futures Research Annual Report 2010 states that future increases in farm productivity will be driven by high level agribusiness and technical skills and a greater focus on management and leadership skills.

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The average size of the almost 26,000 Māori freehold title farm holdings is 59 hectares or about half the size of most New Zealand farms. Many of the larger Māori-owned sheep and beef farms over 2000 hectares represent multiple small titles amalgamated into economic units under the management of Māori trusts and incorporations.

While their distance from urban centres 'complicates access to (the) specialist consultancy, technical advice, training and services _ (and) farm contracting services' in comparison to many mainstream farms',²⁶ Maori-owned farms are often major employers of Māori in the rural regions where Māori comprise a high proportion of the population, and where there are limited other local employment options.

Māori trusts and incorporations manage about 64% of land under Māori title on behalf of shareholding Māori owners, who commonly require that trustees adopt a 'conservative, risk-averse'²⁷ approach to borrowing in the interests of continued security of land title. These shareholders often require that management achieves social, environmental, cultural, and spiritual as well as commercial objectives, that will enhance the long term wellbeing of the whanau, hapū or iwi ²⁸collective to whom the shareholders affiliate – objectives that are shared by many in Māori agribusiness enterprises.²⁹

Māori farms and Māori farm employees make a significant contribution to national production figures. Maori pastoral farmers farm about 720,000 hectares and are worth an estimated \$7.5 billion. The Māori dairy sector owns over \$100million worth of Fonterra dairy shares and contributes about 10% of the national milk solids production, while Maori sheep and beef farms carry up about 15% of the national herd stock.

Important though their contributions are at the national level, the performance of Maori farm assets is arguably of even greater significance to local economies and rural communities.

²⁶ Maori Agribusiness in New Zealand: A study of the Maori Freehold Land Resource. (2011). Ministry of Agriculture and Fisheries, Wellington, p.16.

²⁷ <http://www.teara.govt.nz/en/ahuwhehenua-maori-land-and-agriculture>

²⁸ Whānau: 'the basic building block of Maori society' (Rangihau, cited in King,1975), an extended family unit; Hapū: a collective of whānau where membership is determined by genealogical ties through lines of descent, the basic political unit of Maori society (*Traditional Maori Concepts*, Ministry of Justice, 2001); Iwi: a temporary alliance or confederation of hapu established as a response to particular political or other circumstances (Henare, 1998).

²⁹ Maori Agribusiness in New Zealand: A study of the Maori Freehold Land Resource. (2011). Ministry of Agriculture and Fisheries, Wellington, p.iii

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Māori farming in Te Tai Tokerau

Agriculture is the main driver of Northland's economy and the region's only billion dollar sector. The sector is estimated to contribute 35% of regional GDP; more if processing is included. Māori agricultural workers, most of who are pastoral farm employees, account for about 33% of the total regional workforce. While Maori owned land in developed pasture represents only around 8% of the total developed pastoral land in Northland³⁰, Treaty settlements and the forthcoming return of Landcorp farms to iwi will lift this percentage significantly.

Māori-owned farms in Te Tai Tokerau operate at 65% of the profitability of other farms.³¹ Lack of education and training in new technologies is a contributing factor, along with difficulty accessing independent advice, slow response to market signals, and restricted access to development capital.

The Ministry of Agriculture and Fisheries (2011) considers that the ability (of governance, *and* of management) to make decisions, and access to appropriate skills and capability, are two main factors influencing economic growth opportunities for Māori-owned farms.³² MAF describes a need for upskilling across the range of roles in Maori agribusiness, and recommends 'greater investment by Maori organisations in the continual upskilling of their governors and their staff, from farm managers to junior shepherds' and 'bespoke support services' (for on-farm technical, and financial management skills).³³

The recommended access to relevant skills training and 'bespoke support services' for rural Māori-owned farms and Māori farm employees in Te Tai Tokerau remains an aspiration rather than a reality.

A 2010 Workplace Productivity research project completed by Venture Group for the Department of Labour identified that the low workplace literacy, numeracy, financial and digital skills levels of the staff on six Northland farms were a significant barrier to improved farm productivity. Neither farm managers nor farm staff were to access practicable skills training options to address their skill gaps, primarily because of the time demands of farm work, the rural isolation of the farms on which they worked, and few WPL training providers or provision options.

³⁰ *Building capability on Maori-owned farms*: There are 133,009 hectares of Maori owned land in Northland, representing around 11% of Northland's total land area. Approximately 30% of this land is in developed pasture, 20% in exotic forestry, 20% in scrub or poor quality pasture with the remainder either undeveloped or Nga Whenua Rahui title.

³¹ Maori Farm Consultancy Guidelines (2008), Sustainable Farming Fund. Source: <http://maxa.maf.govt.nz/sff/about-projects/search/L07-008/index.htm>

³² Maori Agribusiness in New Zealand: A study of the Maori Freehold Land Resource. (2011). Ministry of Agriculture and Fisheries, Wellington. p17

³³ Ibid. pp.iii-iv

Background

The initial idea for this research emerged out of Venture Group's involvement in a Department of Labour (DOL) project to identify barriers to improving workplace productivity on six Northland farms.³⁴ The majority of the farm owners, farm managers, and farm employees involved had unmet workplace literacy training needs. In its early stages, the research identified that low workplace literacy skills presented a significant barrier to improving the farms' productivity. Although delivery of workplace literacy and numeracy skills training to farm employees was beyond the brief of that research, Venture Group tried, without success, to find them a practicable training option. Literacy provision to rural farm employees is a longstanding problem nationally.

This finding about low workplace literacy skills corroborated research conducted by Ag ITO (2009), which found that the communications, calculations, and computing/IT skill levels of over 40% of the agriculture sector workforce were below those required for the effective management and operation of modern agriculture businesses.³⁵ This skill gap presented a real challenge to an agriculture sector already under considerable pressure to upskill in order to increase productivity.³⁶

AgITO trainee completion rates are low across all qualifications but AgITO has particular interests in increasing the uptake and achievement of skills training by Māori farm managers and employees. AgITO is a party to the 2008 Māori Land Training Strategy, a priority of which was to increase the number industry-qualified Māori agriculture employees.³⁷ In 2010 just over 18% of 6,791 AgITO industry trainees were Māori, the majority of who are employed in rural regions that have limited tertiary education provision and often poor broadband coverage.

Workplace literacy, numeracy and communication skills were highlighted as fundamental to farm employee capability development in the 2009 and 2010 *Futures Research Annual Report*. The 2009 Report notes that workplace literacy training delivery needs to take account of the varying levels of education of farm employees. Compounding the effects of low graduate recruitment to the sector, the literacy and numeracy skills levels of 60% of all land-based employees are below the level required by their work tasks.³⁸

³⁴ *Increasing the Performance of Farm SMEs in Northland* (2011), unpublished, Department of Labour. A Workplace Productivity project to improve workplace management and practices as drivers of SME productivity.

³⁵ *Ag TALK* Northland and Waikato April 2011.

³⁶ *AgITO Futures Research Annual Report 2010* states that future increases in farm productivity will be driven by high level agribusiness and technical skills and a greater focus on management and leadership skills.

³⁷ AgITO in conjunction with Horticulture ITO, Forestry ITO, Beef + Lamb NZ, DairyNZ, and key government agencies.

³⁸ *AgITO Futures Research Annual Report 2009*, p 5.

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Research partnership

Venture Group has considerable experience in delivering workplace literacy training to Māori employees in private sector construction, wood processing, residential care and retail companies, the majority of which have been located in Whangarei. It also has an established research history with AgITO, so approached its Literacy and Numeracy team to discuss the Workplace Productivity project's workplace literacy-related findings.

The two parties decided to develop a research proposal and successfully applied for Ako Aotearoa funding for a research project to:

- Assess the workplace literacy skill requirements, skill levels, and skill training needs of a sample of Māori farm employees in Te Tai Tokerau, in relation to
 - workplace prose and document literacy
 - communications and language
 - digital literacy, and
 - numeracy and financial literacy.
- Explore the effectiveness of practicable delivery solutions to meet the identified workplace literacy training needs.

Ag ITO has several initiatives underway in relation to its priorities as outlined earlier but this research was the ITO's first opportunity to be involved in a Māori-in-Agriculture initiative in Te Tai Tokerau.

Venture Group and AgITO expected that the research findings would:

- inform the design and delivery of workplace literacy needs assessment and training for Māori farm enterprises and their employees in Northland, and
- have potential to be replicable/adaptable
 - across the wider agriculture sector (e.g. farming, horticulture, forestry)
 - with Māori employees in other primary production sectors, and
 - in other regions.

To this end, the findings, recommendations and tools would be made available for consideration by workplace literacy providers and tutors across industry sectors as well as to other key stakeholders.

The project also gained support from Te Puni Kokiri's (TPK) regional office in Whangarei and the Commission for Financial Literacy and Retirement Income, Wellington. Both organisations were

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interested in the project's longer term potential to assist their respective business goals: TPK in relation to professional development for Māori farm employees and succession planning in relation to farm management; and CFLRI in relation to delivery of money management skills training to employees (including Māori) in rurally isolated areas who are unable to access generally city-based financial literacy seminars.³⁹

The project budget was compiled on the basis that, in addition to a direct investment of staff time by Venture Group, financial assistance would be available from Ako Aotearoa (towards the research activity) and Te Puni Kokiri (to meet travel costs to Māori farm employees on remote rural farms).

Unfortunately despite genuine desire from regional TPK colleagues, the project coincided with cuts in TPK's budget so it was unable to support the project in financial terms. Having secured support from Ako Aotearoa, Venture Group decided to proceed with the research in a way that was as practical as possible given the limitations of the reduced project budget.

³⁹ Part of the RC response to the National Financial Literacy Strategy 2008, which aims to encourage financial education in the workplace and provision of information and tools to help inform people's money management decisions.

Introducing the Project

Modern Farms as Productive Workplaces

The issue behind this research is that the business performance of many farm enterprises is constrained by the literacy and numeracy skill levels of their managers and employees.

Modern farm enterprises are increasingly complex businesses. Individual dairy farms for example are multi-million dollar industries in terms of turnover, with the capital value of the average herd of 366 cows exceeding \$6.5 million.⁴⁰ A range of farm ownership and financing models apply across the agriculture sector regardless of farm type, evidencing the move away from family owned farms towards an agri-business approach.

At the farm enterprise level, farm performance and productivity increasingly reflect not only the qualifications and experience of employees but the speed with which they can adopt innovative practices and apply new research findings to their operation. Low workplace literacy skill levels affect employees' job performance, their ability to work with other people, and how easily a farm business can incorporate new ideas, new technology or new approaches into its operations.

Just under a third of Northland's population is Māori, compared with 14.6 per cent for all of New Zealand. The majority of Māori land-holdings nationally are in rurally isolated areas where a high proportion of the population is Māori, and where distance acts as a barrier to participation in tertiary education – this reflects the situation for Māori farm employees in Te Tai Tokerau.

Māori Farm Consultancy Guidelines (2008) estimated that Māori-owned farms in Northland operate at 65% of the profitability of other local farms, and identified a lack of education and training in new technologies as a contributing factor to this situation.⁴¹

In a presentation to the Hui Taumata Mātauranga V, Durie (2006:7) noted that a focus on business development skills was vital to the Māori economy, and that the economic volatility associated with primary production returns in a global marketplace add particular imperatives for highly skilled business leadership of tribal land holdings and Treaty settlements, and the rapid development of a knowledge-based Māori economy.

⁴⁰ Nationally, 21% of dairy herds have more than 500 cows.

⁴¹ Other factors include difficulty accessing independent advice, slow response to market signals and restricted access to development capital, and governance structures for multiply-owned Māori land that 'can complicate decision making and implementation of modern farming systems'. Source: <http://maxa.maf.govt.nz/sff/about-projects/search/L07-008/index.htm>

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However, the fact that delivery of skills development to adults (who often have other priorities such as parenting, working at their jobs, and contributing to whanau and community) is an extremely complex rather than simple matter, is indicated in TPK's 2011 review, *Te Whakapiki i te Pānui me te Tatau mō ngā Kaimahi Māori: Improving literacy and numeracy for the Māori workforce*. The review showed that literacy and numeracy outcomes for Māori adults had further declined in the five years since the release of the International Adult Literacy Survey data (IALS, 1996), and despite a range of initiatives which had been launched since that time to lift Māori adult literacy and numeracy skill levels.^{42,43}

The 2011 review lists the characteristics of successful literacy and numeracy programmes for Māori adult learners as including:

- location within Māori communities or integrated into the workplace
- effective marketing to potential Māori learners
- low or no cost programmes
- programme design reflects Māori needs and aspirations

These characteristics listed both *reflect* the WPL training needs and WPL training preferences of the Māori farm employees in this research project, and also by implication *confirm* the barriers of location and cost that confront farm employees across the farming sector in relation to skills development training.

Improving literacy in farm workplaces

Research has found that literacy skills learned in school have the greatest impact on adult literacy skill levels. However, a comparison of the 1996 and 2006 combined ALLS and (IALS) results show that school-based literacy initiatives during that period have made little difference to young people aged 18 to 24. The combined data shows that:

- over 40% of that group have prose and document literacy levels below Level 3;
- Māori have lower prose and document literacy than Pakeha; and
- males have generally poorer literacy than females - data of particular relevance to this research (Chapman and Tunmer, 2008).

More generally, the 2006 international Adult Literacy and Life Skills (ALL) survey indicated that 1.1 million New Zealanders (43% of adults aged 16–65) lacked the proficiency at level 3 or above in literacy and numeracy that has been described as the level needed for individuals to fully participate in a knowledge-based economy and society.⁴⁴

⁴² The attainment of Level 3 or higher numeracy skills by Māori adult learners was about half the rate of non-Māori adults.

⁴³ Chapman, J., Tunmer, W. (2003). *Gender, Ethnicity and Literacy Performance among Young Adults: When more seems to result in less*. Massey University.

⁴⁴ CAB Minutes (07) 40/2 refers.

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Regardless of cause, low literacy and numeracy skills act to constrain people's job choices and security, and to limit their contributions to workplace and community.⁴⁵

Government funding support for delivery of workplace literacy training in workplaces stems largely from the ALLS and IALS results from 1996 to 2008. The Tertiary Education Commission's definition of functional adult literacy references reading, writing, speaking and listening, numeracy, critical thinking, and technology skills- skills that cover the workplace literacy requirements of the majority of work tasks.⁴⁶ Employers however, increasingly require staff to apply important additional skill requirements in the workplace, including financial literacy.

The National Adult Literacy and Numeracy Assessment (ALNA) covers only limited aspects of financial literacy, through decimal-based number problems which require a working knowledge of money. In the real world however, lack of knowledge about general concepts around money management, financial planning, and investment, and about common financial products such as loans, mortgages, interest, dividends, and insurance negatively impacts on the work performance and financial well-being of many adults.⁴⁷

Farm employee access to workplace literacy training is constrained by several factors. Farm working hours fall outside the '9 to 5' timeframe and vary to meet the changing demands of each season. Most farm employees live a considerable distance from urban-based training providers and their long working days limit off-farm travel. Many farms still have low engagement with communications and information technology, meaning that their managers and employees are unable to take advantage of online education options.⁴⁸

In the farming context, financial literacy skill levels could be expected to influence farm employees' performance in relation to many different aspects of farm operations - machine maintenance, feed budgeting, stock ratios, financial planning, staff turnover, and employment-related contracts and negotiations.

⁴⁵ Over 80% of this group is employed and increasingly expected to be able to operate in workplaces and roles that require employees to operate with high levels of literacy and numeracy, communicate effectively with staff and customers, and quickly adapt to new workplace technology. Some of this group left school with low or no qualifications, are native speakers of languages other than English, or have little or no experience with modern technology.

⁴⁶ National Adult Literacy and Numeracy Progressions, <https://assess.literacyandnumeracyforadults.co.nz>

⁴⁷ 2008 ANZ-Retirement Commission Financial Knowledge Survey found those with less knowledge were more likely to be amongst people with lower levels of formal education, income and net wealth, and renters rather than homeowners.

⁴⁸ Ibid, p 6

Methodology

The project:

The key stages of the project were:

- **Recruiting farms and participants:** obtain the buy-in of at least five farms employing Māori staff whose farm owners and Māori farm employees agree to participate in a research project that involves the assessment of literacy and numeracy skills.
- **Literature review:** review LLN training for adults, LLN pedagogy, and LLN delivery to Māori learners; definitions of financial literacy and digital literacy and approaches to financial and digital literacy assessment and training for adults with low literacy and numeracy skill levels.
- **Company Profiles:** prepare profiles for each farm in consultation with the farm manager or owner to include information on its employees, the management of the work, and farm business operational systems and processes.⁴⁹
- **Farm Job Profiles:** prepare a profile covering generic farm tasks and roles to inform the development of assessment tools that reflect the working reality and literacy and numeracy requirements of work roles.⁵⁰
- **Workplace Literacy Assessments:** Develop four assessment tools.
 1. **Literacy and Numeracy Assessment:** an hour long literacy, language and numeracy workplace assessment tool based on the farm workplace.
 2. **Literacy and Numeracy Self-assessment:** a list of farm tasks and skills against which participants can rate their performance.
 3. **Financial Literacy Self-assessment:** a checklist of financial terms and concepts against which participants can rate their level of understanding (in terms of being able to explain these to another person), plus several behaviour-based questions about budgeting and financial management.
 4. **Digital Literacy Self-assessment:** a checklist of computer and other digitally-based skills against which participants can rate their performance.

⁴⁹ Refer Appendix 4: Company Profile, p 57.

⁵⁰ Refer Appendix 5: Farm Job Profile, p 64.

Recruiting farms

The project aimed to work with up to five farms of different types (State owned, Māori Trusts and privately owned farms) and 15-20 Māori employees. Research as outlined earlier showed that Māori farm employees' levels of literacy and numeracy were generally low and that their completion rate of national qualifications was also low.

Inviting people to participate in research, particularly into literacy and numeracy training needs, needs to be approached with care. Venture Group was careful to clearly outline the time and other commitments that it would require from farm managers and farm employees, as well as the confidentiality of findings to the researchers and the potential benefits that might emerge as a result of participation in the research, for the Māori agriculture workforce of the future.

There was no funding for travel so the project needed to be undertaken with careful management of travel costs.

There was no database to identify farms which would meet the research criteria, that is:

- farms with Māori staff;
- farms that had Managers who were prepared to have their Māori staff be part of the research, and
- farms where the Māori staff were prepared to be part of the research.

Venture Group had anticipated that finding research participants would require considerable effort and a significant amount of time. It drew heavily on its extensive regional networks, contacts with regional Ag ITO and Dairy NZ staff, individuals involved with Māori trusts, connections established through earlier farm-based projects, and personal/family networks in agriculture. Contacts often referred the researcher to their own network contacts, which the researcher then 'cold called'.

This process identified 25-30 farms as potential participants; that is, were known to have Māori employees, were the desired farm type, and so on. A number of farms were contacted that did not meet the criteria – for example, Māori employees were no longer employed, were close to retirement, or did not want to participate.

Feedback from one employer was that their staff member was unwilling to take part in the research. The employer commented that her employee is very shy and private.

The employer suspected the employee had literacy difficulties and that this was the reason that the employee was not interested in being part of the research project.

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Ten farms from this group were contacted for a more in depth discussion about the research aims and its requirements in terms of down-time, timing, and farm manager support. On-site meetings were held on five farms to discuss the project further, and these farms agreed to participate in the research. The engagement ratio of 1:3 farms was indicative of the interest in literacy and numeracy skills training in Te Tai Tokerau.

The farms were located in Helensville (Otakanini Topu Incorporation⁵¹), Poroti (owner-operator), Parakao (owner-operator), Kaikohe (Landcorp), and Kaitaia (Landcorp). Two farms were dairying units, one was mixed dairy and dry stock, and the other two were sheep and beef farms. Their farm managers all highlighted the importance of a positive working culture as most farm tasks are done in small teams or pairs. They also confirmed that these days, farm staff need to have well-developed literacy and numeracy skills in order to be considered for promotion or expected to advance in their farming careers.

Recruiting participants

Excluding owners and farm managers, the farms employed 31 staff of who 17 were Māori. The majority of Māori employees were haukāinga⁵² who had chosen farm employment in order to be able to continue living on land owned by their whanau. The three employees at Otakanini were whānau shareholders in the Trust. The marae to which the Māori employees at Parakao affiliate adjoins the farm on which they work.

At two farms, employees were all whānau/whanaunga and where they lived and worked was their tūranga waewae⁵³. The interconnecting links of 'whānau and whenua⁵⁴ have a direct effect on how work happens and on how learning occurs in their workplaces. Whanau working with other members of their whanau usually brings Māori-specific dynamics into play, and these operate alongside or provide an overlay to the dynamics related to employees' work roles, work seniority, and experience.

Within the context of whanau and whanaungatanga, the tuakana / teina relationship generally reflects the relative seniority of participating parties in relation to genealogical descent, but relative seniority may be decided on the basis of particular expertise, or the demands of a particular situation. Applied to the farm work context, tuakana / teina framework enables knowledge to be safely transmitted from an older or more knowledgeable person to a younger or less knowledgeable or less able person (Rangihau: 1977, Pere: 1989). The tuakana / teina

⁵¹ Finalists in the 2011 Ahuwhenua Trophy for Māori excellence in sheep and beef farming.

⁵² Haukāinga: Home, true home, local people of a marae, home people.

⁵³ Literally tūranga (standing place), waewae (feet): a place to stand; foundation, place in the world, or home.

⁵⁴ Whenua: land, also placenta

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concept also allows for the fluidity and reciprocity inherent in learning as a shared experience, as expressed in the concept of ako: 'The process of learning becomes reciprocal – both tuakana and teina learning from each other' (Sharples: 2006, 2008). In the cultural context of this work environment, ako is real, natural and 'just happens'.⁵⁵

The researcher observed the tuakana / teina framework in action during discussions with these employees, and in their interactions with their farm manager, for example, in the deferment of questioning and decision-making by the group to one person regardless of the seniority in terms of age or job position of other members. The functioning of the teams on these two farms was based on the sharing of knowledge and skills between the team leader and workers, on reciprocity, on interdependence. Employees saw their reliance on each other - for example, to interpret information - as a group strength rather than as an individual weakness.

The importance of whitiwhiti korero (open communication), and discussing the research kanohi ki te kanohi (literally face to face, in person) in a Māori context required the researcher to be thoroughly prepared for the on-site meetings with farm employees and when gathering information for the Farm Job Profile, and to be open about her own interests in relation to the research project.⁵⁶ The language of the workplace was English on all farms, apart from occasional use of Māori phrases in conversational settings, for example, 'Kia ora' (greetings, welcome; and also used as a signifier of agreement), 'Ka pai' (well done), and 'Kei te pai' (that's fine, that's good).

"While on the farms, in particular Otakanini and at Parakao, I could see ako in action. In particular the principle of ako that affirms the value of working together to solve a problem. This was particularly apparent when doing the numeracy assessment. The guys had already told me that they work as a team on the farm, so I just let the assessment become another team activity."

Researcher

The researcher responded to the whānau context on these two farms by using the self-assessments tools as group activities, so that the employees could apply their preferred, ako-based approach to learning and sharing of information. Close teamwork sits comfortably with the Kotahitanga concept, or principle of unity and direction, where whānau members work towards goals or achievements are 'co-operative and whanau based, encompassing physical, emotional, and spiritual as well as intellectual growth (Hirsh: 1990, cited in Te Kauhua, 2006).

⁵⁵ This approach could be described as reflecting the principles of mātauranga Māori which include, but are not limited to: whakawhanaungatanga (working together and networking), whanaungatanga (recognising the importance of kinship and relationships of the extended family), manaakitanga (caring for and supporting others) and kaitiakitanga (guardianship, preservation and protection).

⁵⁶ Direct contact between researcher and participants (provides) the context for the negotiation of the research relationship (Smith: 1991, Cram: 2001; Pipi et al: 2004; Wihongi: 2002).

Literature Review

The literature review focused on financial literacy and digital literacy definitions, and approaches to skills assessment and training in those skill areas for adults with low literacy and numeracy skill levels.

The literature review found that while a great deal of adult literacy-related research had been produced in New Zealand, most of it has been done by educators looking at adult literacy in the context of pre-employment tertiary education programmes⁵⁷ offered by TEIs (Polytechnics) and PTEs and, in particular, within the rather amorphous framework of foundation learning⁵⁸, rather than with employers and employees in workplace environments.

In fact, both within New Zealand and internationally, research into workplace literacy and numeracy is limited, small scale, and variable in quality.

Partly this is because workplace-based adult literacy training is still a relatively new field, beginning as it did from a very small base in 2001. At this time, foundation learning became more of a government focus, and the Workplace Literacy Fund was developed as part of a suite of 'upskilling' initiatives. Since then, research into workplace literacy in New Zealand has primarily revolved around the Fund.

An interim evaluation of the Fund and early programmes, carried out in 2002 by Skill New Zealand (now TEC), found, amongst other findings, that:

- employers wanted to use the Fund to enable staff to gain new qualifications or update old ones
- employees were keen to take part— any initial reluctance passed very quickly
- programmes attracted Māori and Pasifika employees with low qualifications
- overall, managers found the programmes useful for lifting employee confidence, morale and participation in workplace communication.

However it took another five or so years for momentum to build and for increased numbers of employers to see the results of workplace-based literacy and numeracy training on employees and on the businesses.

⁵⁷ Including Adult and Community Education (ACE).

⁵⁸ The most broadly accepted definition of foundation learning currently seems to be the Ministry of Education / NZQA joint definition: *'The application of a complex web of reading, writing, speaking, listening, critical thinking, problem solving, numeracy skills and communication technology so that people can achieve their own goals in meaningful social, cultural, vocational and/or learning contexts...often in the context of other learning.'*

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In a 2007 report reviewing the TEC's Workplace Literacy Fund for the Department of Labour⁵⁹, feedback from employers was demonstrably positive about the benefits of Workplace Literacy, Language and Numeracy (LLN) programmes. Often the benefits were noted by default, that is, by identifying the effects of low employee LLN skills on their businesses⁶⁰. However, increasingly employers were able to identify specific positive changes in employee behaviour due to involvement in a workplace literacy programme, particularly in the areas of improved health and safety quality and compliance, communication and participation in company activities.

The next few years were characterised by growing interest in and a growth in literature about workplace based LLN, but much of it generated by political interest, rather than research enquiry. For example, a 2008 five year LLN action plan implemented through the National Skills Strategy had a particular emphasis on improving workforce literacy and numeracy⁶¹.

This was followed by the Department of Labour commissioning an evaluation of the Upskilling Partnership Programme⁶². Interestingly, this ambitious study found no conclusive quantitative evidence that workplace LLN programmes improved participants' reading and writing skills, despite positive self-assessment and feedback from employers.

Perhaps because the focus of research has been on the Fund(ing), there has been little research on workplace LLN skills from a pedagogical standpoint. Very few studies, for example reference Kirkpatrick (2006), whose evaluation model distinguishes between four possible outcomes of training in organisations, including impact on learners' behaviour at work (level 3) and impact on organisational performance (level 4).

In fact, there is very little genuine workplace LLN research at all, and the little that has been done is characterised by small sample sizes; limited sources of data and an over-reliance on self-reported information; lack of pre-course and post-course comparisons, and poor completion

⁵⁹ The limited research into workplace based adult literacy has been further divided by it being funded by two major government agencies, each with a different research focus. The Department of Labour-funded reports have been most focused on the outcomes for companies (such as increasing productivity for employers) while the TEC's programme reports focus on improving employees' LLN skills (thus individual learner gain).

⁶⁰ These included: quality issues (and the cost of these); accidents and emergencies if staff didn't understand or comply with health and safety; extra time and money spent ensuring that staff understood instructions and requirements; the risk of legal action and risks to exports with poor quality compliance; absenteeism; high numbers of complaints; low morale; high staff turnover.

⁶¹ The National Skills Strategy initiative was shelved prior to implementation because of a change of Government.

⁶² This three year programme was designed in response to the large numbers of working-age adults without the language, literacy, and numeracy (LLN) skills necessary for sustained employment and active participation in society. It was developed to increase the engagement of employers/workplaces engaged in workplace LLN training, primarily by accessing TEC's Workplace Literacy Fund.

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of post-course assessments. The prime reason for these limitations has been the unavailability of adequate funding to undertake more controlled, quantitative research.

If the New Zealand literature on workplace LLN in general can be seen as limited, there is an even greater paucity of literature on workplace LLN specifically related to Māori employees. As Rawiri (2005) noted, indigenous people recognize the importance of English language skills in today's world but little attention had been paid to indigenous people's particular issues in adult literacy.

A (2011) review commissioned by TPK, *Te Whakapiki i te Pānui me te Tatau mö ngā Kaimahi Māori: Improving literacy and numeracy for the Māori workforce*, asserts that despite an arguably greater focus on adult literacy and numeracy over the past five years, literacy and numeracy outcomes for Māori adults have actually further declined. The review cites three LLN case studies, though none had solely Māori participants, and only one study, conducted in 2009, was workplace-based.⁶³

In 2010, Venture Group undertook a research project⁶⁴ to explore the relationship between workplace literacy and Te Reo Māori (Walker, 2010). The research demonstrated that there was a specific need for employees in some workplaces, for example the aged care and home based health sectors, to have Te Reo Māori me ona Tikanga⁶⁵ as part of their essential workplace skills set.

Māori health providers constitute some of the largest employers in rural regions such as Te Tai Tokerau, where Māori represent a high proportion of the widely dispersed rural population as well as a high proportion of native speakers of Te Reo Māori.⁶⁶ Walker (2010) showed that Māori health service users who are native speakers of Te Reo Māori consider that the ability to converse in Te Reo Māori serves to enhance the quality and effectiveness of the services provided by Māori health provider staff.

Equally, for businesses based in rural towns and provincial cities in regions where Te Reo Māori is in everyday use by a proportion of the population, businesses with employees able to engage with customers in Te Reo Māori hold a potential sales advantage in relation to Te Reo Māori speakers.⁶⁷

⁶³ The Learning Wave PTE delivered its *TeamWorks* programme to Downer EDI Works staff in 2009.

⁶⁴ Funded by an innovation grant from Pūtea Arapiki Ako, designed to encourage ITPs, Wānanga and PTEs to undertake innovative projects that will raise the literacy and/or numeracy skills of Māori and/or Pacific learners.

⁶⁵ The Māori language and Māori customs.

⁶⁶ Waikato, Bay of Plenty and East Cape. Source: <http://www.tetaurawhiri.govt.nz/maori/issues>

⁶⁷ Te Reo Māori is spoken by 10% of Northlanders, 28% of Māori in Northland (Statistics NZ 2006 Census).

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Walker's research found that:

"developing capacity and capability in meeting the needs of native speakers of Te Reo Māori who prefer to receive services in Te Reo Māori must then necessitate a different approach to literacy in the workplace."

and further, that:

"there is an opportunity in the area of literacy and particularly workplace literacy for initiatives that will make a positive difference for employees in workplaces where they may be required to use Te Reo Māori me ōna Tikanga."

As with workplace LLN literature specifically related to Māori employees, there is little publicly available material on industry sector-specific workplace LLN. While some Industry Training Organisations have commissioned literacy strategies and even the occasional small field-based project, published work is limited.

In the agricultural sector, some general work has been done on employee literacy and numeracy issues, but again nothing specifically related to needs of Māori employees on farms.⁶⁸

With regard to digital information literacy capability development, the sole New Zealand study located was related to the tertiary environments of ITPs and universities. Its key findings were that having dedicated time, support and the opportunity to experiment with a range of ICT tools was essential to develop digital information literacy, and that large changes to participants' digital information behaviour and skills could be achieved with a relatively short and intensive period of training.

More New Zealand information is available related to financial literacy from the Commission for Financial Literacy and Retirement Income (CFLRI - formerly the Retirement Commission) which spent almost a decade developing resources, including the 'sorted' website and booklets⁶⁹.

'sorted' provides a clear definition of financial literacy:

'the ability to make informed judgements and make effective decisions regarding the use and management of money.'

Much of the New Zealand information draws on work in the United Kingdom that distinguishes between financial *capability* and financial *literacy*. While there is not yet a generally accepted definition of financial *capability*, at its core it means having the knowledge, understanding,

⁶⁸ AgITO (2009), AgITO (2011)

⁶⁹ The Reserve Bank also provided useful material.

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skills, motivation and confidence to make financial decisions which are appropriate to one's personal circumstances.

Someone can be financially *literate* (in the sense that they have the knowledge, understanding and skills which would enable them to manage their personal finances well) without necessarily being financially *capable*. There are two distinct aspects of managing money, namely *keeping track* and *making ends meet*, in other words, a person's financial capability is best judged by their actual behaviour.

The 2008 ANZ-Retirement Commission Financial Knowledge Survey found those with less financial knowledge were more likely to be amongst people with lower levels of formal education, income and net wealth, and renters rather than homeowners. A large proportion of these people are Māori.

Integrating financial competence into workplace based LLN offers advantages to both an individual and their employer. There are associations between an individual with higher LLN skills levels and their personal development and building of confidence and technical skills, and their increased likelihood of employment, career development and higher earnings. For an employer, a workforce with higher LLN skills levels improves the business's ability to modify workplace practices and introduce innovations to increase productivity and profitability.

Conclusions:

The review of the literature suggests that more high quality, rigorous tightly focused, large-scale studies are required of how workplace-based LLN training operates, in practice and in detail, and how digital and financial literacy can be most effectively integrated into LLN training in workplaces.

Developing the Skills of Māori Farm Employees in Te Tai Tokerau seeks to apply a WPL needs assessment and training approach that extends beyond the common WPL model, through its foci on:

- the inclusion of financial and digital literacies within the usual brief of speaking, listening, reading, writing and numeracy literacies
- Māori adults
- Māori employed in pastoral farming, the largest Māori agriculture sector, and

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- Māori pastoral farm employees in Te Tai Tokerau, as a rural region whose characteristics also represent other regions in which Māori pastoral farming is a major Māori land use.

Its findings will add to the currently limited stock of knowledge about workplace LLN assessment practice and training needs in New Zealand, and particularly for Māori adults, as outlined above.

Development of Workplace Profile and Farm Job Profile

Company Profile

Company (workplace) profiles were prepared for each of the five farm enterprises in consultation with the farm manager or owner.⁷⁰ The profiles comprised information on three aspects of the farms – the employees, the management of the work, and the business systems and processes used on the farms.⁷¹

All five farms employed a structure of team leaders and work teams. The Landcorp and Māori Trust farms had farm managers, while one farm owner held the position of farm manager himself, and the other owner/operator had delegated farm management responsibilities to an employee. Each team had defined areas of responsibility and clear reporting lines.

All of the farm managers highlighted the importance of having a positive working culture as most farm tasks were done in small teams or pairs. Appropriate and effective communication impacted positively on productivity and achievement. Speaking, either face to face or via phone, was the main form of communication.

The ability to recall key points and communicate these accurately to others was seen as crucial. Employees were expected to use their farm notebooks to jot down work related issues and observations throughout the day. They did not generally use computers for work purposes, but they were increasingly using other digital technology applications such as mobile phones (including texting/messaging), and GPS.

All of the farm managers encouraged their staff to take part in in-house and off-farm training, and recognised that staff needed to have well-developed literacy and numeracy skills to be considered for promotion or expected to advance in their farming career.

The characteristics of the 17 Māori participants in relation to the context of this research project are summarised in Appendix 2: Participant Characteristics, p 55.

Farm Job Profile

In order to ensure that the assessments were fit for purpose (valid, reliable) and relevant to the employees, Venture Group developed a Farm Job Profile⁷² using information gathered from a number of sources:

- meetings with managers/owners to build the company profile

⁷⁰ Refer to Appendix 4: Company Profile, p 57.

⁷¹ For example the use of structured recruitment processes, employment contracts, induction processes; quality management systems, having written business objectives, an annual plan etc.

⁷² Refer to Appendix 5: Farm Job Profile, p 64.

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- desk-based review/analysis of workplace and related documentation: farm company profile, manuals, health and safety information, signage, maps, checklists, etc.
- on-site observation of employees at work, and visiting staff in various job situations to identify the literacy demands of work roles and tasks, and the language and terminology used in farm operations
- talking with employees about their jobs and job tasks.

In many ways, the last source was the most important for the development of the Farm Job Profile, and for enhancing the quality of the relationship between the researcher and employees.

Pedagogically, employee input was required to inform and validate the relevance of the assessment tool. Discussions with employees about their work roles and tasks ensured that the researcher obtained the level of detail required to create the literacy and numeracy assessment tool.

At the same time the discussions helped employees to realise the extent to which they used literacy and numeracy in their jobs – for example, to determine the amount of drench required to dose 500 sheep, based on a certain rate per animal. It enabled them to demonstrate their expertise.

Developing the assessment tool in effect became a collaborative effort, a process where '(T)eaching/learning, experience and experimentation were co-operative ventures in which everyone involved learnt something new' (Hemara, 2000:8). Drawing on the respective expertise and experiences of researcher and farm employee, the process reflected important aspects of *ako*, the educative process in Te Ao Māori, described by Pere (1982:49) as a reciprocating dynamic between learner and teacher, and learning and teaching.

'It was an opportunity to connect and make it all about them – for the participants to be the knowledgeable ones.

They know what their jobs involve better than anyone. If anything, the learner becomes the teacher.'

Researcher

Time spent in the workplace with employees also helped to build the relationships that Bishop (1999) and Wihongi (2002) stress as so important to the research process from a Māori perspective.

Using a collaborative approach set a constructive environment for the research activities and served as a trust building exercise between the different parties. It took away – or indeed

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reversed - notions of 'the researcher' as 'teacher' – the person with knowledge - and 'the students' as those without knowledge.

Development of self-assessment tools

Venture Group developed four assessment tools for this project, including three self-assessment tools:

- a workplace literacy and numeracy self-assessment tool designed to be completed in group settings under the facilitation of the researcher
- a financial literacy self-assessment tool, and
- a digital literacy self-assessment tool.

Literacy and Numeracy self-assessment

Venture Group's usual WPL assessment approach is based on an hour-long individual assessment session with each employee. The assessment session includes assessment of an employee's:

- speaking and listening skills through discussions about their job, and
- reading, writing, and numeracy skills (basic math functions, area, estimation, reading a graph, etc.) through the completion of a paper-based assessment tool

Several of the research participants commented in discussion that they had chosen to work on farms because they were 'not into' reading and writing. The researcher considered these comments and the work contexts of each farm when arranging the assessment sessions.

A work-team approach was observed on all five farms. In at least two farms, the team approach was whānau based, and also reflected aspects of a kaupapa whānau approach, where membership is based on shared history, context, or purpose (Smith: 1995)⁷³, that is, the farm as a commercial operation. Both of these farms completed the hour long literacy and numeracy assessment in a group setting; on one farm, the numeracy component was completed with group input to individuals; on the other, the whole assessment was approached as a group exercise, which stimulated considerable discussion about how literacy and numeracy were embedded across farm operations.⁷⁴

In practical terms, it suited farm operations for the employees to be released as a group from farm duty to complete their assessments.

The literacy and numeracy self-assessment listed numerous skill tasks related to farm operations and asked participants to rate these against graded scales to show how often they

⁷³ From Smith, G. (1995) *Whakaoho Whanau*, cited in *Analysis of the Characteristics of Whanau in Aotearoa*, Research Centre for Māori Health and Development, School of Māori Studies, Massey University (2005), p12.

⁷⁴ See Appendix 6: Literacy and Numeracy Self-assessment, p 65.

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did each task, and how well they performed them. The grades were expressed in everyday terms that employees had used in their discussions with the researcher.

The participants could see from the list the wider range of farm tasks that actually utilised literacy/numeracy skills. Being able to read, write, speak, listen, and do maths was relevant to their work, on a daily basis.

Financial literacy self-assessment

The importance of assessing financial skill levels became apparent during the development of the Farm Job Profile. The farm visits and observations revealed the extent to which farm employees needed an understanding of financial matters in relation to, for example, the implications of farm budgets on expenditure, responsible management of resources, and timeframes for particular operations. The Farm Manager for each farm was responsible for financial analysis and financial decision-making, then delegated farm operation priorities decided from that basis to farm employees to implement. The 17 participants were not therefore required to have business-level financial literacy.

An understanding of basic financial terms and confidence in discussing personal financial matters with banks however, are skills needed by adults to function successfully in a modern society. The financial self-assessment tool was primarily a checklist of common financial terminology and concepts, and participants were asked to rate how well they could explain these to another person. The checklist of 23 common financial terms was compiled from materials from the CFLRI and from *Making the most of your Money* (2004), a United Kingdom *Basic Skills* resource. The tool also included several behaviour-based questions related to personal budgeting and money management.⁷⁵

The terminology used in the rating scale again reflected the language used in discussions by the farm employees, for example, 'sort of' instead of a more formal term or number. The 'sort of' rating category appeared to help open up opportunities for participants to discuss the terminology with each other. An explanation of the terminology in everyday words sometimes led a participant to demonstrate that they had an understanding of a particular concept but used different words for it.

The self-assessments enabled the research to compare each participant's need to learn (in terms of the literacy and numeracy requirements of their work tasks) with their desire to learn more. This was also a deliberate process to 'seed' the idea of further training, and to hook

⁷⁵ Refer to Appendix 7: Financial Literacy Self-Assessment Tool, p 67.

participants in to the possibility of being part in a workplace literacy training programme in the future.⁷⁶

Digital Literacy self-assessment

Much of the data collected electronically on the farms is fed directly into a central farm data base and computer related work tasks and analysis is generally undertaken by the farm managers/owners. Only one of the farms used email as part of business communication and this was only between the manager and his 'upstream' managers.

Cell phone usage is however an important method of communicating on all of the farms⁷⁷ and increasingly other digital tools such as GPS are used.

Most of the participants were not required to use a computer on a daily basis as part of their farm work, however, some were stock or herd managers, who could be expected to benefit in the performance of these roles from utilising software and websites related to product information, market prices, breeding cycles, meteorological data, etc.

The digital literacy self-assessment therefore listed tasks related to the use of computing and other digital and technology applications. It required the participant to indicate whether they could use everyday computing programs such as email, search engines, word processing, and Excel; and whether they could perform basic tasks on digital devices such as cell phones, GPS and other farm/personal technology applications. The ratings included the opportunity to indicate that they would like to learn how to do a task.⁷⁸

Facilitated Literacy and Numeracy Assessment

Venture Group used the Farm Job Profile to design a contextualised hour-long literacy and numeracy workplace assessment tool which required participants to listen, speak, read, write, calculate, estimate, and to apply formula to solve number problems.

There is a suite of generic online adult literacy/numeracy assessment tools developed for the National Centre for Literacy and Numeracy for Adults and available to WPL providers, but that option was considered inappropriate for this project for several reasons:

- Not all participants possessed basic computing knowledge
- None of the farms were equipped to provide their employees easy access to computers in the farm workplace

⁷⁶ The self-assessment data could be used to develop individual learning plans in future WPL training.

⁷⁷ There are significant broadband and cell phone coverage issues in many rural areas of Te Tai Tokerau.

⁷⁸ Refer to Appendix 8: Digital Literacy Self-Assessment Tool, 68.

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- Administration of the on-line tool would have taken significantly longer than the time made available by the farmers for this aspect of the project
- The on-line tool could not offer specific farm-related context or tasks, which were both pivotal to engaging the farm employees in the project and for highlighting the connection between their input into the Farm Job Profile and the final assessment tool.

It was also important that the assessment process was as comfortable and appropriate as possible. For example, at Otakanini and Parakao, where the employees all belong to the same whānau, the assessment was done together, at the same time. That group approach would not have been possible with the online tool which has to be individually administered.

The literacy and numeracy assessment required participants to complete writing, reading, speaking and listening tasks, and a series of numeracy tasks.

The tool assessed skill levels in the following literacy/numeracy areas:

- **speak to communicate** – work/‘toolbox’ meetings, giving instructions, giving feedback, responding to enquiries, engaging with external parties, engaging in workplace cultural contexts
- **listen to understand** – interpreting and following instructions, recalling key information
- **read to understand** – accessing and understanding work-related documents, manuals, newsletters, brochures, contracts, schedules, etc.
- **write to communicate** – completing work forms and records, completing training assignments, surveys, contacting or responding to suppliers, etc.
- **make sense of number to solve problems** – workplace calculations, everyday maths
- **measure and interpret shape and space** – using maps, volumes, estimation
- **reason statistically** – interpret and use statistical information and concepts

The numeracy assessment also included everyday financial numeracy problems that helped to assess participants’ skill levels in relation to financial numeracy knowledge and strategies.

“The assessment process had to be really, really flexible – partly to fit in with the different work situations and when people were available – but mainly some of the guys had been really reluctant to take part in the project.

Keeping them motivated as they attempted the assessment required a certain amount of persuasion”
Researcher

On the two farms where the employees were all of the same whānau, the numeracy assessment in particular became a shared activity where the employees asked each other how to do something.

The assessor made the decision not to interject but made a note of who was sharing the answers, acknowledging that this group approach was a familiar and appropriate way that these whānau members worked together and went about doing things.

Researcher

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Assessment results

Literacy

Both the self-assessment and facilitated literacy assessments identified that all 17 participants had significant knowledge gaps across all but two of the seven Progressions.⁷⁹

- *Speak to Communicate*

In the '*Speak to communicate*' progression, the participants were assessed as operating at the skill level required by their work roles and in their current, familiar, workplaces. They the speaking assessment with confidence in the one-on-one situation and interacted appropriately with the assessor using a range of speaking skills including seeking clarification as needed.

Learning Progression:

Speak to Communicate

Assessed Skill Level	< Step 3	Step 3	Step 3-4	Step 4	Step 4-5	Step 5	Step 5-6	Step 6	> Step 6
Participants					1	1	15		

- *Listen to Understand*

The listening assessment task encouraged participants to take notes, and even though 13 of 17 participants did so, only one participant was able to correctly answer all of the subsequent questions.

This reflected farm managers' views that there appeared to be a culture of asking for instructions throughout the day, rather than employees noting down information and tasks in their farm notebooks and then using that information to get on with the job independently.

During the initial meeting, one farm manager commented that "some of the guys don't listen. They often do a couple of the set tasks, then contact their leader or the manager to ask what else they have to do."

Learning Progression:

Listen to Understand

Assessed Skill Level	< Step 3	Step 3	Step 3-4	Step 4	Step 4-5	Step 5	Step 5-6	Step 6	> Step 6
Participants			2		4	9	2		

- *Read to Understand*

⁷⁹ Refer to Appendix 3: Summary of Assessment Results, p 56.

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During the workplace observations and as part of the speaking assessment, participants had been asked about their preferred learning style. All had indicated that reading was not their preferred choice, commenting instead that they 'were hands-on', 'like to be shown', 'like to then have a go and work it out'.

Two participants commented in their WPL self-assessments that they could not read and that they struggled and relied on others to read for them. The reading assessment results show however, that none of the participants' reading skills were up to the reading levels required by their current job tasks and responsibilities.

"Reading is my downfall. I know my bad reading really holds me back"

Employee, Herd Manager

When asked about reading training manuals or Health and Safety material, six participants said that they found manuals confusing. Twelve did not attempt the task that required them to read and interpret data from a graph. Only two demonstrated that they had the skills to summarise a piece of text.

This level of performance has serious implications for employee safety and productivity in an industry where hazardous goods and complex work processes abound, and where environmental and product quality demands are being ratcheted up by export market requirements on an on-going basis.

The positive result of the reading assessments however, is that nine participants said that they would like to up-skill in reading.

Learning Progression:

Read to Understand

Assessed Skill Level	< Step 3	Step 3	Step 3-4	Step 4	Step 4-5	Step 5	Step 5-6	Step 6	> Step 6
Participants			4	3	6	1	3		

- *Write to Communicate*

The employees' self-assessment mirrored the results of the facilitated assessment – all employees participants struggled with writing in the farm context.

Participants found it an effort to use their farm notebook and fulfilling the written requirements of any training that they undertook was extremely challenging. Most of the participants

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indicated that they would like to develop some aspect of their ability to write. There was high interest in improving spelling, vocabulary and grammar.

Learning Progression:

Write to Communicate

Assessed Skill Level	< Step 3	Step 3	Step 3-4	Step 4	Step 4-5	Step 5	Step 5-6	Step 6	> Step 6
Participants		2	5	4	3	1	2		

Numeracy

• *Make Sense of Number To Solve Problems*

The numeracy assessment included tasks requiring the participants to use strategies to solve problems across a range of numeracy progressions.

Nine participants were assessed as having low level numeracy skills at Steps 3 through Step 4 in the *Making sense of Number* Progression, and demonstrated limited knowledge of how to apply basic calculation functions and techniques in their work setting.

Four participants were assessed at Step 4-5, indicating that they will be experiencing some difficulty in calculations related to work tasks, and four at Step 5-6. This last group of participants was working from a reasonable numeracy skill base, and could make quick gains from short, intensive training targeting their specific numeracy skill gaps.⁸⁰

Learning Progression:

Make Sense of Number to Solve Problems

Assessed Skill Level	< Step 3	Step 3	Step 3-4	Step 4	Step 4-5	Step 5	Step 5-6	Step 6	> Step 6
Participants		2	6	1	4	2	2		

Financial Literacy

Only 8 participants assessed themselves as being able to explain 17 or more of the 23 common financial terms in the Financial Literacy self-assessment, and only 9 participants could explain half or more of the terms. Seven of the 17 employees indicated that they understood the terms internet banking, interest rates and payee, and five said they could explain the meaning of credit risk to another person. Fifteen of 17 participants knew their personal

⁸⁰ Double gains could be expected if the targeted numeracy training utilised computers and introduced these participants to spreadsheet programs – digital literacy skills enhance learners ability to manipulate numeric data.

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financial status, but 10 participants did not have a personal budget, and 14 were not aware of the resources available through the 'sorted' website.⁸¹

WPL Skill Area: *Financial Literacy (self-assessed)*

Assessed Skill Level	Confident to Explain >16 of 23 Financial Terms	Knows Own Financial Situation	Has Personal Budget	Confident to Discuss Finances with Bank	Knows 'sorted' Website
Participants	8	15	7	11	3

Digital Literacy

Although all but one of the 17 employees owned a home-based computer, less than half indicated that they were able to use a computer 'in some way'. Several commented that the computer was "the wife's" domain.

All 17 employees were able to use a cell phone for making phone calls. Two participants did not know how to send text messages, and two could not use the camera facility. All but one participant knew how to use the calculator function on their cell phones.

Thirteen of the 17 participants were keen to access computer-related training - setting up and using spread sheets, templates, and databases; accessing animal health, pastoral farming and meteorological websites, etc.⁸²

The researcher grouped the participants into three categories based on their responses to the digital literacy assessment's checklist, as below.⁸³

WPL Skill Area: *Digital Literacy (self-assessed)*

Assessed Skill Level	Confident User of Digital Technology	Introductory Level of Digital Skills	Limited Digital Technology Skills	Would like Computer Training
Participants	8	15	7	11

⁸¹ This low level of the 'sorted' brand awareness bears out the key concern of CFLRI in relation to the general Māori adult population, as discussed in Venture Group's original discussions with CFLRI.

⁸² Refer to Appendix 3: Summary of Assessment Results, p 56.

⁸³ The majority of participants used cellphones for phonecalls or txts where coverage allowed.

Reflection:

Reflection is an important aspect of WPL practice. The researcher noted the following points as being key influencers in the conduct and outcomes of the research project.

- *Workplace Literacy – more than reading and writing.* The researcher outlined the scope of WPL to farm managers in the initial stages of the project, using the national Adult Literacy Progressions and examples of their relevance to farm operations. The managers then each recounted their own observations about how employees' workplace literacy skill gaps affected the running of their farm, for example, difficulties in getting the right skills mix in a work team for particular tasks, lack of licenses or qualifications, and poor record keeping.
- *Clarity about research aims, focus, timeframes and methods.* Farms are complex, seasonally affected, multi-million dollar businesses. The farm owners and managers appreciated being presented with a succinct research proposal which they could quickly assess for relevance to their farm. They needed to be able to do a rough cost-benefit on participation, and to assess the practicability of the proposed research activity in terms of access to staff, staff buy-in, impact on staff workloads, cost of down-time, potential outcomes, and long term implications.
- *Management buy-in counts.* The five farm managers participated in the research mainly because they expected it to bear dividends for the running and productivity of their farm businesses. One farm manager also expected it to 'benefit Māori in the future'. At each farm, farm employees wanted clarification that participation was voluntary, and to hear their manager voice support for the project before making any decision.
- *Industry plus Local plus Workplace Literacy knowledge.* Farm managers responded well to the field researcher's own agriculture-specific knowledge and experience, as well as to an outline of WPL contracts completed with well-known companies in other industry sectors. The researcher's farming background was useful when discussing farm tasks with employees as part of compiling each farm's Farm Employee Profile, and when coordinating and giving feedback on employees' assessments.
- *Workplace cultures differ.* Each farm had its own workplace culture, of which some aspects were immediately apparent through in the initial stage of the research, and some emerged over time as a result of observation and discussion during the assessment process. Each farm's workplace culture appeared to reflect the interplay between multiple factors, including:

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- farm management approach
 - economic performance of the farm
 - descent or family links to the land being farmed
 - ethnicity of managers and employees
 - seniority in terms of age, whanau relationships, job role, or skills and experience.
- *Effective assessment tools and processes.* The workplace literacy assessment tools for this research were drawn up then implemented at the farms, following a process developed by Venture Group over the six years that it has delivered TEC-contracted WPL training.
 1. A Company Profile is compiled based upon discussions with the employer and senior staff, and on-site observations of the work tasks and processes undertaken and their associated workplace literacy skill level requirements.
 2. WPL assessments are drawn up that are specific to the work areas and tasks of particular employees or work teams, with consideration of Company Profile.
 3. The WPL Assessor meets with staff to outline an offer of voluntary WPL assessment and training that has the company's support.
 4. An assessment schedule is arranged with the assistance of a 'WPL Site Champion'⁸⁴
 5. Assessments are peer reviewed then trialed in the workplace for fine-tuning.
 6. Assessments are carried out in work hours in a comfortable, quiet but accessible space, with individual, pairs or groups of employees, depending on employee preference, shift or other work requirements, and workplace culture.
 7. A post-assessment debrief is held with each employee to discuss the results, from a strengths-based approach.
 - *Secured funding.* Researchers must ensure that the national office of a government department provides written approval of funding offered by local branches of the same department, prior to commencement of a project.

1. Usually a WPL Site Champion is easily identified and 'enlisted' in the course of initial discussions with the employer. In small companies the WPL Site Champion is usually the owner; in larger companies, a mid-level supervisor or someone from reception who 'knows and is known' by everyone.

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Website Resources:

- National Adult Literacy and Numeracy Progressions,
<https://assess.literacyandnumeracyforadults.co.nz>
- The University of Waikato – National Centre of Literacy and Numeracy for Adults
<http://literacyandnumeracyforadults.com/National-Centre>
- Workbase
www.workbase.org.nz
- New Zealand Qualifications Authority – National Certificate in Adult Literacy and Numeracy Education
www.nzqa.govt.nz/nzqf/search/results.do?q=National+Certificate+in+Literacy+Education&area=&searchSubject=All&type=&lvl=&credit=&status=Current
- Resources for teachers and research projects
www.literacy.org.nz/researchpublications.php?PHPSESSID=6d479ac1d7530d0ed98c907040241acb
- New Zealand Literacy Portal
www.nzliteracyportal.org.nz
- The NZ Network for Financial Literacy
www.financialliteracy.org.nz
- The Commission for Financial Literacy and Retirement Income (formerly the Retirement Commission)
www.cflri.org.nz
- 'sorted' website
www.sorted.org.nz

Appendices

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Appendix 1: National Literacy and Numeracy Learning Progressions⁸⁵

Learning Progressions	Strand	Progression
Literacy Progressions	Listen with Understanding	Vocabulary
		Language and Text Features
		Comprehension
		Listening Critically
		Interactive Listening and Speaking
	Speak to Communicate	Vocabulary
		Language and Text Features
		Using Strategies to Communicate
		Interactive Listening and Speaking
	Read with Understanding	Decoding
		Vocabulary
		Language and Text Features
		Comprehension
		Reading Critically
	Write to Communicate	Purpose and Audience
		Spelling
		Vocabulary
		Language and Text Features
		Planning and Composing
		Revising and Editing
Numeracy Progressions	Make Sense of Number to Solve Problems	Additive Strategies
		Multiplicative Strategies
		Proportional Reasoning Strategies
		Number Sequence
		Place Value
		Number Facts
	Reason Statistically	Preparing Data for Analysis
		Analysing Data for Interpretation
		Interpreting Data to Predict and Conclude
		Probability
	Measure and Interpret Shape and Space	Shapes and Transformations
		Location
		Measurement

⁸⁵ Sources: *Learning Progressions for Literacy* (2008), and *Learning Progressions for Numeracy* (2008), Tertiary Education Commission, Wellington.

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Appendix 2: Participant Characteristics

Within the context of this research, the main characteristics of the 17 participants are listed in below.

Participant Characteristics				
Gender			Farm Job Position	
	Female	1	Operations Manager	8
	Male	16	Farm Assistant	7
Ethnicity			Trainee	2
	Māori	17	AgITO Training Agreements	
	Hāukainga	12	Level 3	2
Age in Years			Level 4	
	15 to 20	2	Level 5	
	21 to 30	3	Highest AgITO Qualifications	
	31 to 40	5	Level 3	2
	41 to 50	4	Level 4	1
	>50	3	Prior Experience in Other Industry	
Years at Farm			Army	1
	<1	4	Forestry	1
	1 to 5	4	Variety	1
	6 to 10	4	Employing Farm by Ownership Model	
	11 to 15	0	Maori Trust	3
	16 to 20	1	Government	8
	>20	2	Owner/Manager	6

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Appendix 3: Summary of Assessment Results

The participants' assessment results in relation to the Strands of the Literacy Progressions are as listed below.

Learning Progression Strands					
	Reading comprehension & reading critically	Writing for purpose; grammar; spelling; planning	Speaking interactive listening and speaking	Listening note taking; comprehension	Numeracy Making Sense of Number
<Step 3					
Step 3		2			2
Step 3-4	4	5		2	6
Step 4	3	4			1
Step 4-5	6	3	1	4	4
Step 5	1	1	1	9	2
Step 5-6	3	2	15	2	2
Step 6					
>Step 6					

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Appendix 4: Company Profile

Company name:		Type of business:	
Address:			
Liaison person name:		Position:	
Phone:	Fax:	Email:	
Contact date and names:	Notes:		
Background	<i>When established?</i>		
	<i>Recent changes in company or affecting company? (e.g. changing markets, technology, labour force)</i>		
	<i>Current priorities, main issues?</i>		

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Markets, products, services	<i>Primary/priority markets?</i>	
	Product range	
	Changes to markets/ product range in past few years?	
	Quality management system in place? (e.g. Standard Operating Procedures, ISO)?	
	Technology used (GPS; electronic scales, computers, measuring devices, record keeping, iphones, fencing and irrigation units, alternative energy, CCTV, etc.)	

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Key processes, work areas, teams	Name of Department:	Size:	Hours of work/shifts:	Structure of supervision:

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Organisation structure	Organisation Chart	
Workforce	Full-time employees	Number:
	Part-time employees	Number:
	Contractors	% of workforce:
	Casual staff	% of workforce:
	Age range:	
	Average length of service:	
	NESB	% of workforce:
	Languages spoken:	
	Qualifications / educational background?	
	Recruitment – processes used?	

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Terms of employment	Skill based pay? Y / N	Pay rates:	
	Pay system:	Brief explanation:	
	Overtime worked regularly? Y / N	Which roles/teams?	
	Union involvement? Y / N	Collective agreements? Y / N	Individual agreements? Y / N
	Induction processes? Y / N	Brief explanation:	
	Industry or other employer supported training?	Brief explanation:	

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Training experiences	Company involvement with: <i>National Qualifications Framework</i>	
	<i>Industry Training Organisation(s)</i>	
	<i>Other training providers</i>	
	<i>Current on job training</i>	
	<i>Past on job training</i>	
	<i>Current off job training</i>	
	<i>Past off job training</i>	
	<i>Managing release of employees for training?</i>	
	<i>Employees doing training in their own time?</i>	

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On-job literacy demands		Instructions are given: Mostly in writing?; mostly spoken?; Equally written and spoken?
	What speaking and listening do employees do?-	
	What speaking and listening do employees do - In other languages?	
	What do employees need to read? (e.g. orders, work, product directions, gauges)	
	What do employees need to write? (e.g. forms, training assignments)	
	What maths do employees need to do? (e.g. weighing, measuring, calculating)	
	What equipment do employees use? (transport, machinery and plant, tools, animal health and feed monitoring equipment)	
	What technology do employees use? (fencing and irrigation units, GPS, electronic scales, computers, measuring devices, iphones, etc.)	

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Appendix 5: Farm Job Profile

Operation	Tasks	Literacy Skills
Stock work	Yard work Weighing stock Drenching Tagging Stud work Shearing, crutching	Head counting Reading scales Calculating correct dosage Record data as required Record data accurately Tally, record accurately
Milking	Set up dairy	Read and understand SOPs
General Maintenance		
Weed control	Grubbing Spraying	Mix sprays correctly
Fencing	Repairs Erect fences	Calculate materials & measure correctly
Water system Irrigation	Detect and repairs leaks Use equipment correctly	Follow pump manual, instructions Communicate problem clearly
Machinery	Maintain equipment	Record maintenance checks
Health and Safety		
Hazards	Isolate, Minimise, Eliminate	Follow procedures correctly Complete appropriate forms Report as required
Health & Safety Plan Motorbikes, tractors	Implement plan Follow farm safety policies	Read farm plans Read and understand policies Have driver licences
Team work		
Communication	Communicates with others	Read newsletters/notice boards
		Text messaging, emails, phoning Understand instructions, written & spoken Give clear instructions & messages
Training and development	Takes part in training	Understand written material Write to communicate clearly
Workload	Follows work plans Completes reports	Read and understand Record completed tasks as required

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Appendix 6: Literacy and Numeracy Self-assessment

Literacy and numeracy tasks

Below is a list of tasks that you are quite likely to perform while working here. These tasks require you to read, write, interact with others and do some calculations.

Give yourself a rating on a scale of 1 to 4 in each of the two columns below.

Frequency of task

- 1: every day
- 2: weekly
- 3: monthly
- 4: not very often

Want to learn more

- 1: would really like to know more
- 2: would like to know a little bit more
- 3: know quite a lot, could do with a brush up
- 4: feel ok about doing this

Task	Frequency 1, 2, 3, 4	Would like to learn more 1, 2, 3, 4
Speaking and listening tasks		
Speaking up at meetings		
Training new staff		
Running meetings		
Dealing with the public e.g. stock agents		
Giving instructions		
Receiving instructions		
Receiving feedback from the boss		
Phoning stakeholders e.g. vet, stock agent		
Using the telephone		
Asking questions		
Reporting to others about what has happened		
Reading tasks		
Reading and understanding information such as work diagrams or drawings		
Vehicle manuals and instructions		
Safety manuals and safety information on containers such as sprays, drenches and chemicals		
Training manuals AGITO, GrowSafe, First Aid		
Staff newsletters/whiteboard		
Other Health & Safety material		
Farming magazines		

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Task	Frequency 1, 2, 3, 4	Would like to learn more 1, 2, 3, 4
Fonterra reports, production figures		
Writing		
Tally books, shearing records, stud work		
Filling in forms such as incident reports		
Information for others to read e.g. phone messages		
Reports – weekly, monthly		
Workbooks for training		
Spelling		
Vocabulary – using a range of words		
Grammar –correct sentence structure and punctuation		
Entering information in to work notebook		
Maths/numeracy		
Using a calculator		
Reading scales e.g. weighing stock		
Calculating area, volume – sprays, feed, drench, chainsaw fuel		
Measuring length – fencing, building		
Reading charts, graphs, gauges		
Adding and subtracting e.g. counting stock		
Multiplying and dividing e.g. working with stock		
Calculating percentages – lambing, stock numbers		
Understanding farm finances		
Working out and managing the budget		
Tallying		
Using the computer		
Read and send emails		
Write reports		
Complete farm forms		
Access farm documents		
Name and Save 'Killing' Schedules		
Access the Internet for work		

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Appendix 7: Financial Literacy self-assessment

Financial literacy is defined as the ability to make informed judgements and make effective decisions regarding the use and management of money.

Could you explain these financial terms to another person?

Financial Term	Yes	No	Sort of
Income			
Expenses			
Surplus			
Personal overdraft			
Debit card			
Credit card			
Internet banking			
Interest rates			
Payee			
Balance			
Bank statement			
Mortgage			
Credit risk			
Assets			
Loan shark			
Gross Income			
Net Income			
Tax rate			
Lay-by			
P.I.N.			
Budget			
Loan			
Direct debit			
Are you aware of your financial situation?			
Do you have a personal budget?			
Do you feel confident discussing your financial matters with your bank?			
Are you aware of the SORTED website? www.sorted.org.nz			

Sorted is a free independent money guide, run by the Commission for Financial Literacy and Retirement Income. It's full of calculators and information to help you manage your personal finances throughout life.

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Appendix 8: Digital Literacy self-assessment

<i>Cell phone skills</i>	Can do	Can not do	Want to learn
Use cell phone to make phone calls			
Send text messages			
Use phone calculator			
Browse the internet			
Use the camera facility			

<i>Other digital devices</i>	Can use	Can not use	Want to learn
GPS			
i-phone			
i-pad			
e-reader			
MP3 players	-	-	

<i>Email and internet skills</i>	Can do	Can not do	Want to learn
Open email program to create, send, then file an email			
Open, and forward, emails with attachments			
Create an address book, distribution list			
Access internet and search 3 set topics			
Navigate between webpages			
Locate information using urls and links			
Save urls to Favourites			
Explain functions & limitations of search engines			
Save and print webpage			

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Word Processing Skills	Can do	Can not do	Want to learn
Create, edit, and save a document in Word			
Create, edit, and save a document in Excel			
Use tool bar & keyboard functions to navigate within document			
Format document according to instructions			
Use tool bar and keyboard functions to edit document			
Copy document, save under new name in appropriate folder			
Insert CD/DVD/USB, open & edit document, save changes			
Print document from CD / DVD / USB			

Computer Skills	Can do	Can not do	Want to learn
Connect power, mouse, keyboard, printer, internet cables			
Turn computer/laptop & printer on/off & on again			
Open 4 programs from START menu			
Open 4 programs using desktop icons			
Open main program, demonstrate tool bar & tab functions			
Open secondary program, demonstrate tool bar & tab functions			
Move between programs using minimise / maximize functions			
Move between folders and files in main program			

Excel Skills	Can do	Can not do	Want to learn
Enter data into Excel or company templates			
Create and save a worksheet			
Move between worksheets			
Select, copy, move, & delete cell data			

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Format cells using format and formula functions
Sort Data
Create graphs from Excel data

Using the computer	
	Yes No
Do you have a computer at home?	
What do you use your computer for? Look at the list below and place a tick, either yes or no, for each of these uses of the computer.	
Trade Me	
Internet Banking	
Facebook	
Research to get information e.g. use GOOGLE	
Saving photos	
Sending emails	
Playing games	
Looking for jobs	
Study	
Personal budget	
Booking flights/ holidays	
Purchasing products	
Children use for homework	
Writing formal letters	
Other	