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PROGRAMME



Rethinking Agricultural Qualifications for the Digital Age

Kellogg Rural Leadership Programme

Course 55 2026

Carlos Mancera

I wish to thank the Kellogg Programme Investing Partners for their continued support.



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Executive Summary

It took a while to arrive, but online learning came at a hiss and a roar during COVID and is now firmly embedded within vocational education. Nearly everyone is using it in some form today, but are we actually doing it well?

When I set this project up I asked the question... "How does online learning perform in vocational agricultural training, and what does this mean for delivering NZQA-recognised qualifications?"

As the project developed, the central themes became easier to identify. In many ways, this project became a SWOT analysis of online learning within vocational agricultural education.

In hindsight, the topic was extremely broad and I nearly fell into the trap of paralysis by analysis. The literature and research pointed toward a wide range of connected issues surrounding online vocational agricultural training. I followed up the literature findings with surveys for both students and educators, and interviews with industry stakeholders. I wanted to see what people on different levels were experiencing.

The big issues:

- Online learning is not the main problem. Bigger issues are poor systems, low motivation, outdated thinking, and training that does not always match industry needs.
- Online learning suits agriculture well, especially for people living far from town.
- Tutor support still matters. Learners want guidance, feedback, and interaction.
- Staying focused online is a major challenge.
- AI is changing education quickly and the sector is struggling to keep up.
- Secondary agricultural education appears under-supported and inconsistent between schools.
- Funding pressure may be encouraging "bums on seats" behaviour and weaker delivery.

Main recommendations:

- Redesign assessment approaches for the AI era through greater use of practical verification, oral questioning, and authentic workplace evidence. AI is already here, so let's use it.
- Improve resource support, funding, and consistency within secondary agricultural education because strong learner foundations begin there. Teachers need better backing, not constant pressure and fragmentation.
- Make vocational education funding more contestable and reduce protection of outdated delivery models. Increase competition to improve outcomes.
- Recognise the importance of pastoral care within successful online vocational training. Pastoral support systems should be funded separately.
- Strengthen tutor capability in online delivery, learner engagement, digital systems, and AI use. Use the technology.

In the beginning I thought the issue was a lack of uptake with online learning. What I found instead was a system under pressure from changing technology, AI, learner expectations, funding pressures, and shifting industry needs. Online learning is already here. The bigger question is whether we are prepared to design and support it properly... or do we bury our heads in the sand?

Executive Summary Snapshot

The following SWOT analysis (Figure 1) summarises the key themes identified through the literature review, surveys, interviews, and wider sector observations.



Figure 1: SWOT analysis of this project.

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Acknowledgements

First and foremost, thank you to my wife, Jane. My project demanded weekends, late nights, and a great deal of headspace, and you supported me through it all.

The Kellogg Rural Leadership Programme has been a privilege to be part of. It has provided not only knowledge but perspective. My thanks to the New Zealand Rural Leadership Trust for delivering a programme that challenges participants to think critically, invest in research, and contribute meaningfully to our sector and the wider world.

I would also like to acknowledge the New Zealand agricultural industry itself. It is an industry built on resilience, innovation, and a willingness to adapt. The openness of farmers, rural professionals, and sector leaders to share their experiences and perspectives reflects a deep commitment to continuous improvement. It is a privilege to contribute, in a small way, to an industry that feeds, supports and represents our country so strongly on the world stage.

Finally, thank you to those who gave their time to complete the surveys and to speak with me during this project. Your honesty, experience, and willingness to engage in thoughtful discussion added depth and clarity to this work. Plus, I needed to remain unbiased so I needed someone to state the obvious.

Foreword

Why I chose this topic...

I have been involved in sheep and beef farming for most of my life. At 16 years of age I started work at Castlepoint Station (Wairarapa). Over the next three decades I worked through a range of farming roles before eventually becoming farm manager on Huiarua Station (Tokomaru Bay). Somewhere along the way I also bought a mandarin orchard, thinking that might ease me into the quieter end of life. Instead, a completely different career started developing alongside it.

Around seven years ago I moved into agricultural training. Initially I did not see myself as a teacher. I simply knew the industry, enjoyed helping younger people coming through, and understood the reality of farming life. Over time that developed into teaching full-time within vocational agriculture.

Like many others in education, 2020 changed the way I worked. When the COVID-19 lockdowns arrived, teaching suddenly shifted online. There was no long lead-in or perfect system sitting there waiting. You just adapted and got on with it. Since then, a large part of my teaching has remained online.

Currently I teach within the Growing Future Farmers programme on behalf of Eastern Institute of Technology (EIT). Through this role I work with more than 120 students each year, many of whom are entering the industry for the first time.

For the past few years I have been living in Rarotonga, and in many ways that distance has been useful. I am no longer fully inside the New Zealand agricultural training system day-to-day. I am slightly removed from it and looking back in from the outside. That perspective has probably shaped my thinking and helped launch this project.

While in Raro, looking in, I watched Te Pūkenga form with Labour, then be broken apart by National. I watched polytechnics steadily move away from primary industry training because it was clearly difficult to make financially viable. I watched secondary schools struggle to maintain agricultural programmes while dealing with limited resources, staffing issues, and declining support. I watched funding pressures increase and parts of the sector become more fragmented rather than more connected.

I also watched as the farming industry itself continue moving forward. Farming businesses kept adopting technology, improving systems, and modernising operations. In some ways the agricultural industry appeared to be adapting faster than the training systems feeding into it.

Those observations made me start questioning where vocational agricultural training is actually heading. If traditional delivery models continue to struggle financially, and rural learners still face barriers around access, staffing, and geography, then online learning will almost certainly become more important whether people like it or not.

The issue for me is not whether online learning should exist within agriculture. That debate is already over. I think it is more appropriate to ask whether we are designing and using these systems properly? However, you can read the report and make up your own mind.

1.0 Introduction

Agricultural training in New Zealand is under pressure to evolve. Farmers and rural businesses are dealing with tighter regulation, environmental expectations, labour shortages, and rapid technological change. Farming systems today look very different from what they did 20 or 30 years ago.

When I first entered the industry, many farm decisions were based on observation, experience, and handwritten records. Today, farms increasingly use electronic identification, cloud-based software, satellite connectivity, virtual fencing, automated weighing systems, GPS mapping, remote monitoring, and real-time data. Communication has changed as well. Information that once travelled slowly through reps, newspapers, and farming magazines is now shared instantly through online platforms, webinars, videos, and social media.

The industry has modernised quickly, but the training sector has at times struggled to keep pace. This is not to say agricultural education has stood still, because it clearly has not. Over the past five or six years especially, online learning has expanded rapidly across schools, tertiary providers, and industry training organisations.

The COVID-19 lockdowns accelerated this shift. What began as an emergency response quickly became part of mainstream delivery. Tutors, students, and organisations had to adapt quickly, often without the time or systems to do it properly. Some providers adapted well. Others simply transferred classroom material online and hoped for the best. This likely contributed to some of the frustration and scepticism that still exists around online vocational learning today.

Many learners already use online systems naturally in their daily lives. Young people regularly learn practical skills through YouTube videos, podcasts, and short-form content (video bites or TikTok). Farmers increasingly use digital tools within their businesses as part of normal operations. Despite this, online qualifications in vocational industries are still sometimes viewed as less credible than traditional face-to-face delivery.

That tension sits at the centre of this project.

If the agricultural training sector looks closely at the reality of its learners, it will see geographically isolated students, seasonal workloads, staffing shortages, and learners trying to balance study alongside full-time employment. Online learning offers a practical solution to many of these challenges. The issue is whether online systems are being designed well enough to maintain quality, consistency, engagement, and industry relevance while doing so.

2.0 Purpose and Project Question

This project examines whether current perceptions of online learning in agricultural training reflect what is actually happening on the ground, and what this means for delivering NZQA-recognised qualifications that maintain quality, consistency, and industry relevance.

Online learning has the potential to improve access for rural learners by fitting around farm work, seasonal pressures, distance, and family commitments. However, outcomes depend heavily on how well systems are designed and delivered. Poorly structured online learning can quickly become confusing, disengaging, and disconnected from practical industry expectations.

This project does not argue that online learning should replace face-to-face delivery. Instead, it explores how flexibility can be achieved without compromising credible and verifiable outcomes. It also looks at where online learning is working well within vocational agriculture, where it is struggling, and what this may mean for the future direction of agricultural training in New Zealand.

Research Question

How does online learning perform in vocational agricultural training, and what does this mean for delivering NZQA-recognised qualifications?

Aim

To examine how online learning is functioning within vocational agricultural training in New Zealand, and identify implications for delivering quality, consistent, and industry-relevant qualifications.

Objectives

1. Analyse current quality and compliance frameworks
2. Evaluate online learning systems in vocational contexts
3. Investigate the role of technology, automation, and LMS in education
4. Understand the role that AI has to play in education
5. Examine learner engagement and resistance to online learning
6. Understanding our agricultural learners needs
7. Consider generational shifts and emerging learner expectations

Figure 2 shows this framework approach.

Rethinking Agricultural Qualifications for the Digital Age

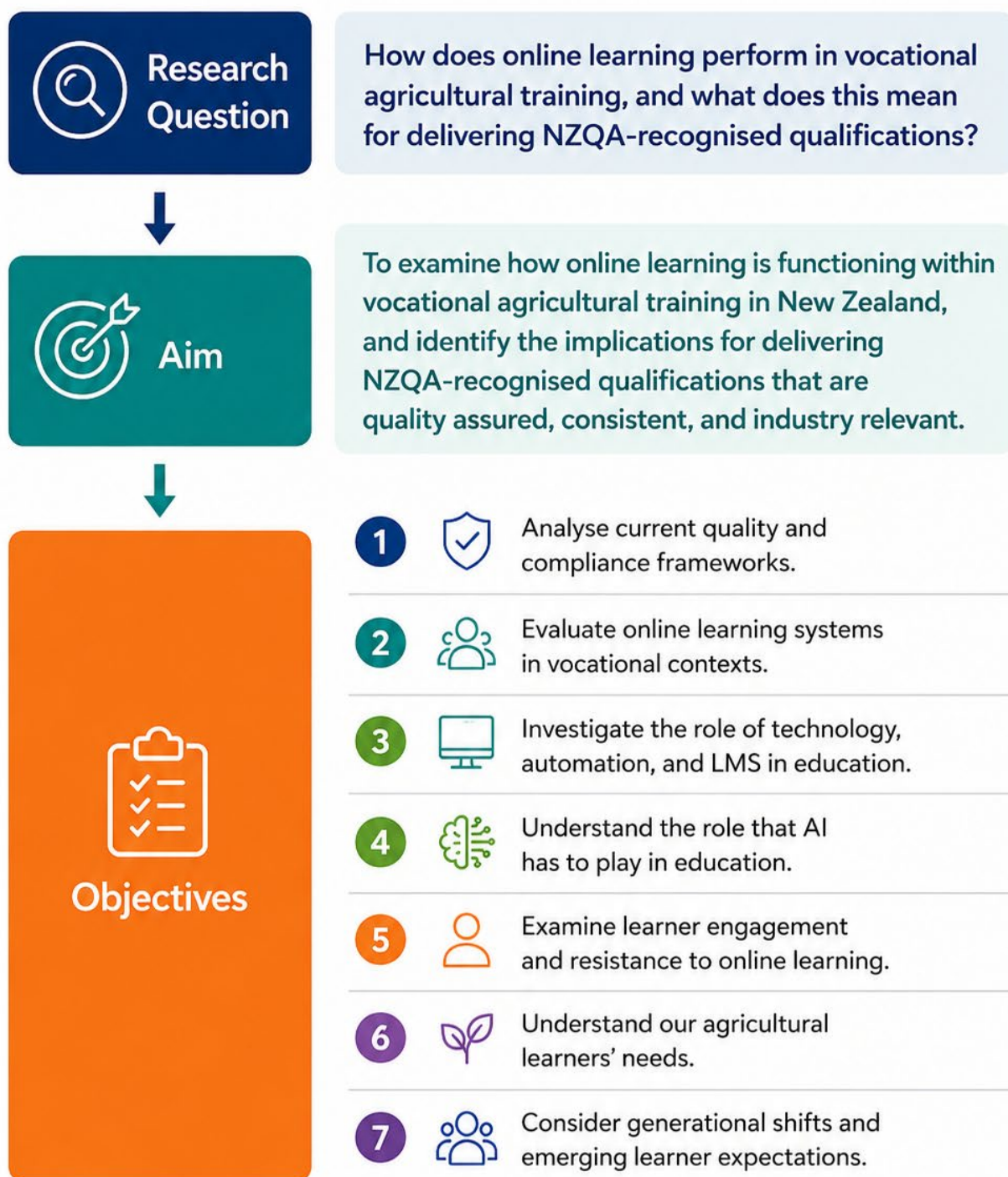


Figure 2: Research framework

3.0 Literature Review

The literature review looks at what is already known, what is changing, and where the main gaps and challenges exist within online vocational agricultural training in New Zealand. It provides the framework for the surveys and interviews later in this project.

3.1 Quality and Consistency Requirements

Farmers and employers expect consistency in graduate capability, and moderation exists to protect that trust. The New Zealand Qualifications Authority states that “education organisations must be able to demonstrate with high quality, convincing evidence that their graduates demonstrate the graduate profile of the qualification” (NZQA, 2020).

Muka Tangata (2025) reported 100% agreement between provider assessment decisions and national standards across 18 learner samples within the sheep, beef, and deer farming sector. That would suggest strong consistency across the way assessment decisions are being applied.

Te Pūkenga (2022) discusses how programmes delivered across campuses, workplaces, and online environments can still be “*worth the same*.” Regardless of delivery method, qualifications must still produce graduates who meet the same industry standards.

That expectation is reinforced within NZQA's quality assurance process, where the words “*national consistency*” was mentioned in the document (NZQA, 2020). We can assume that mode of delivery does not remove the need for this consistency.

Authenticity of learner work is becoming increasingly important. Keesing-Styles and Terrell (2025) found strong concern around AI integration, ethical use, and assessment design, while Shaw et al. (2025) identified increased monitoring for cheating and widespread redesign of assessments. As AI tools become easier to access, verifying learner capability becomes more challenging.

Vocational agricultural training is practical and performance-based (Roslin et al., 2022). Primary ITO (2026) continues to emphasise learning on the job as central to skill development. Agricultural skills such as stock handling, pasture management, and machinery operation must be demonstrated in real-world settings. Online systems therefore need practical ways to capture and verify workplace performance.

3.2 Online Learning Systems and Vocational Education (Agriculture)

Referring to online learning, Abernathy (1999) states “*it's not the next big thing, it is the now big thing*.” More than 25 years later, online learning is still often discussed as though it is emerging. Maybe that should raise questions around why vocational agricultural education has been relatively slow to fully adopt it. Is this due to regulation, sector caution, concerns around practical learning, or simply slow system redesign?

Online learning can mean different things depending on context. Johnston (2020) describes it as part of the wider concept of distance education, where teachers and learners are separated by space, and sometimes time, with technology used to connect them. In New Zealand, NZQA defines online delivery more practically as structured learning delivered through systems such as learning management platforms, webinars, tutorials, discussions, and online activities, delivered either live or asynchronously (NZQA, 2023).

Asynchronous learning might work reasonably well for theory-based learning, but vocational agriculture creates additional challenges because farming is practical by nature. Skills such as stock handling, fencing, machinery operation, and pasture management must be demonstrated in real farm settings, not simply explained in written assessments.

The Ministry of Education Tertiary Education Strategy 2025–2030 recognises that digital tools and artificial intelligence are reshaping education and work (Ministry of Education, 2025). It also supports greater use of online, modular, and work-based learning models.

Shaw et al. (2025) found many instructors and learners preferred hybrid approaches combining online and face-to-face learning.

The limitations of online vocational delivery became particularly visible during the COVID-19 lockdowns. While theoretical learning shifted online relatively quickly, practical training was much harder to replicate. Heath et al. (2021) found that lecturers reported major challenges around student engagement, technical issues, and delivering practical learning online.

The Covid-19 disruption also accelerated digital capability across the sector. Systems improved, staff adapted, and online learning became more accepted within vocational education. For agricultural training, the issue is now less about whether online systems can operate, and more about how they can be designed to support credible, observable workplace competence.

3.3 Technology and Learning Management Systems in Education

With the growth of online learning came Learning Management Systems (LMS) such as Blackboard, WebCT, and later Moodle, which began appearing in tertiary education during the late 1990s (Dahlstrom et al., 2014). By 2014, 99% of United States colleges and universities had implemented an LMS, with more than half of staff and students using them daily. Despite widespread use, many institutions were still mainly using LMS platforms to store and share content rather than support deeper online learning. A key issue identified was inadequate staff and student training.

Heath et al. (2021) similarly found that many educators were familiar with Moodle as a place to access resources, but not necessarily experienced in delivering fully online learning. In many cases, the LMS supported traditional face-to-face teaching rather than functioning as a well-designed online learning environment.

Purwani (2025) identifies educator readiness, infrastructure limitations, and workplace cultures still adapting to digital systems as ongoing barriers. Limited digital capability and insufficient professional development can reduce LMS platforms to little more than online filing cabinets rather than structured learning environments. Purwani also notes that digital learning systems can improve access for remote learners, support flexible learning, and strengthen digital capability. These characteristics align closely with the realities of many rural and geographically isolated agricultural learners.

3.4 AI in Education

Generative artificial intelligence (AI) refers to systems that can create content such as text, images, and data. Within vocational education, AI has the potential to reshape content creation, marking, feedback, learner support, and administration. Used properly, it may reduce workload and improve efficiency within lean training systems.

Shaw et al. (2025) found that most administrators and instructors believed students would need AI skills for future employment, while 39% of institutions expected AI literacy to become a measured learning outcome within three years.

AI also creates risks around accuracy, academic integrity, and assessment validity. AI systems can generate information that appears believable but is factually incorrect. OpenAI (2025) acknowledges that these “hallucinations” still occur despite ongoing improvements. Does this reinforce the need for educator oversight and learner understanding rather than blind reliance on AI-generated content? Can you imagine the harm caused by hallucinated answers when a student does not even know that the answer is incorrect?

AI also makes it harder to distinguish between independent learner work and AI-assisted production. Within competency-based vocational training, this creates challenges around authorship, verification, and qualification credibility.

Research in Aotearoa New Zealand identified AI integration and ethical use as one of the highest professional learning priorities for tertiary educators (Keesing-Styles, 2025). However, many organisations also reported limited internal capability to support effective AI implementation. Internationally, research shows rapid growth in AI use alongside increasing concerns around cheating and academic integrity following the public release of ChatGPT in 2022 (Shaw et al., 2025).

These developments reinforce the importance of vocational systems that rely on authentic workplace evidence and observable practical performance rather than written assessment alone.

3.5 Learner Engagement and Resistance to Online Learning

Online learning can make it harder for tutors to identify struggling or disengaged learners due to reduced face-to-face contact (Edy et al., 2020). This may be particularly relevant for students studying from isolated farms where participation in video calls or online discussions can already feel uncomfortable. Shaw et al. (2025) also found a strong preference for human support over generative AI tools, reinforcing the importance of tutor presence within online vocational learning. They also highlight that as engagement challenges persist, digital tools must enhance (not replace) the human relationships between teacher and students.

Kholifah et al. (2020) suggests that learner disengagement is often linked to repetitive delivery, poor course structure, excessive workload, and traditional lecture-style approaches that focus too heavily on the tutor rather than active learner participation.

McHardy (2023) notes that barriers to using the online environment which would have affected engagement, these were grouped into three categories:

1. Lack of appropriate digital skills and knowledge
2. Poor access to a device and/or the internet
3. Finding time to do it

McHardy reminds us that engagement in online learning is often influenced by practical barriers rather than learner attitude alone.

Pollard (2018) proposes several strategies to improve engagement for geographically isolated learners, including:

- Recognising learner diversity
- Strengthening learner support
- Encouraging collaboration

- Valuing remote communities
- Recognising the impact of geographical isolation
- Providing targeted financial support

Online learning works better when rural learners feel supported, connected, and understood, rather than left to study independently with minimal interaction.

3.6 Learners in Agriculture

Agricultural learners are a diverse group that includes school leavers, farm workers, apprentices, and experienced farmers. Many are studying while working full-time, often in rural or isolated environments. They are generally practical learners with limited time available for study, and they vary widely in academic confidence, digital capability, and internet access. These factors strongly influence how they engage with online learning.

3.6.1 Geographical Isolation

By its very nature, agricultural learners are often geographically isolated. Many are based on farms or in rural communities, working and living away from urban centres and traditional education settings. They do not have the same access to peer networks, campus facilities, or immediate academic support that on-campus learners typically rely on.

Research into remote learner success found that students in isolated environments are more likely to study online, but also face greater risk of disengagement due to reduced interaction, limited support, internet connectivity issues, and the need for strong self-management skills (Pollard, 2018). Although Pollard's work is based in Australia, the findings are highly relevant to New Zealand agriculture. A lot of our farmers live more than an hour from a service town with a training provider. These pressures can become even greater when learners are also balancing full-time farm work, seasonal demands, and inconsistent rural connectivity. Federated Farmers of New Zealand (2025) reveals that mobile coverage currently averages just 57% of farmland and that only 3% of farms get fibre broadband.

3.6.2 Perceptions

This section was not initially intended to be included in the report. Discussions around learner capability can easily be interpreted as criticism of young people, schools, or the agricultural sector itself. This risks distracting from the main focus of this project of the feasibility of online vocational learning systems.

However, interviews with industry stakeholders and training providers repeatedly raised similar concerns around learner engagement and preparedness. These discussions highlighted how public perceptions of agriculture as a career pathway may influence both who enters the sector and how they engage with learning.

Agriculture and horticulture are sometimes viewed as less academically demanding than other professions, which can position them as alternative pathways for students who have struggled within traditional education settings. In late 2025 Burke reported, the Ministry of Education had even proposed that these agricultural subjects should be downgraded to a 'vocational level'.

For starters, online learning creates additional challenges because it requires self-management, digital capability, and ongoing motivation. Learners entering training with low academic

confidence or poor previous engagement with education may therefore require higher levels of structure and support to succeed online.

Student engagement and literacy ability is not a new issue. Similar concerns have appeared repeatedly within industry discussion and across multiple Kellogg Rural Leadership Programme reports, suggesting it is a longstanding challenge within agricultural education. These Kellogg reports are:

- Bron Muir (2010) - The future face of New Zealand's rural industry.
"I was present when the questionnaires were completed and for 80% of the individuals who worked through the questionnaires I was asked to give them reasonably basic comprehension, spelling support and advice. This was for Target Groups 3, 4 and 5. These 16 to 50-year-olds have predominately been attracted to the rural industry because they envisaged that they wouldn't need to qualify in these skills to succeed."
- Jason Rolfe (2015) - Stoking Secondary School Students' Interest in Primary Industry Studies.
"The main stigmas associated with the primary industry were seen as Agriculture was for 'dummies' and the work was too hard."
- David O'Sullivan (2017) - Primary Attraction.
"Many teachers do not want to move over to teaching ag/hort for four main reasons. One of these reasons... Many schools still use agriculture as a dumping ground for the less able and difficult students."
- Renee Fa'atui (2023) - Who's Next?
"Misconceptions of the industry and agriculture / horticulture courses being perceived as a "dummies or easy" course needs to be changed to assist in obtaining more students."

3.6.3 Secondary School Teaching of Agriculture

To attract capable people into the farming sector, agriculture as a subject must be well supported at the secondary school level.

Muir (2010), O'Sullivan (2017), and Fa'atui (2023) all identified challenges within secondary agricultural education, including a lack of teachers with current primary sector knowledge, limited access to resources, and pressures on programme delivery.

The recurrence of these issues across multiple Kellogg reports implies the sector has not adequately supported secondary agricultural education. Teachers are expected to deliver modern, industry-relevant programmes without always having access to current industry knowledge, resources, or professional development. You could assume that this makes it much more difficult to consistently deliver engaging and relevant lessons.

Where this becomes particularly important is when students transition into tertiary education, especially within online learning environments where learners may be studying independently from home through a learning management system. Even capable students can lose motivation if their earlier experiences in agricultural education have been inconsistent or disengaging. The challenge can become even greater for learners who already lack confidence within formal education settings.

You could argue that this highlights the critical role that secondary teachers play in preparing learners for online study, and the importance of supporting them to build the foundations of engagement, confidence, and independent learning that are required at the tertiary level.

3.7 Gen Alpha are Coming!

A further pressure facing tertiary education is generational change. Generation Alpha (those born from 2010 onwards) are the first cohort to grow up fully immersed in smart devices and on-demand digital environments (Al-Sa'di and Ahmad, 2023). They describe them as “*digital natives*,” learners who expect interactive, personalised, and technology-enabled education. Short, flexible online formats are positioned as necessary adaptations rather than optional alternatives.

This shift reflects more than preference. Generation Alpha engages through multimedia, expects rapid feedback, and will enter workplaces that demand AI literacy and technological competence (Al-Sa'di & Ahmad, 2023). In agriculture, young entrants are already working with digital monitoring, compliance platforms, and data-driven systems. If the industry is digitised, training must reflect that reality.

Generation Alpha are not arriving slowly. They are already moving toward the tertiary sector. There are thousands of 14 to 16-year-olds in secondary school now. Born into constant connectivity, this cohort has been shaped by immersive digital environments from the outset (Coolsaet, 2024). The report makes clear that technology is not an optional enhancement to their learning; it is embedded in how they experience the world and education. Higher education is therefore expected to integrate technology meaningfully into curriculum and delivery, including the expanded use of distance education and learning management systems... and it will need to do so quickly.

Traditional tertiary models may lack the agility to respond to this shift (Al-Sa'di & Ahmad, 2023). Online delivery and modular design therefore become mechanisms for maintaining relevance, not simply efficiency tools.

The question is evolving... can providers meet the expectations of the newest generation entering the sector? After all, if we change online learning systems, it will be for this cohort (Figure 5).

I AM THE FUTURE FACE OF FARMING.

SWEET AS, NO PROBS.

HALTER VIRTUAL FENCING

Move cattle with precision from your phone.

DRONE TECHNOLOGY

Check stock, fences and pasture health from the sky.

WEATHER APP

Live forecasts, rain radar and 7-day outlook.

GPS MAPPING

Map paddocks, plan grazing, improve performance.

WHATSAPP

Stay connected with the team, anytime, anywhere.

ONLINE LEARNING

Learn anywhere, anytime. Build your skills.

SATELLITE CONNECTIVITY

Reliable internet anywhere on the farm.

AI ASSISTANT

Instant answers, insights and recommendations to make smarter decisions.

PERFORMANCE & WEIGHING

Track live weights and animal performance. Data that drives profit.

Mob	1 May	15 May	1 Jun
Mob 1	350	400	450
Mob 2	380	420	460
Mob 3	400	440	480
Mob 4	420	460	500

Live Weight (kg): **427 kg**

Daily Gain: **1.42 kg** Cond. Score: **3.2**

NEW GENERATION. NEW TOOLS. SAME PASSION. FARMING FOR OUR FUTURE.

Figure 3: Gen Alpha the future face of farming.

3.8 Literature Summary

This section summarises the key themes and findings that emerged from the review of existing research, industry reports, and policy documents.

Table 1: Literature summary

Quality and Consistency Requirements	• Qualifications must produce graduates who meet the same standard regardless of how they learn. • Online delivery must be worth the same as face-to-face delivery. • AI is making assessment authenticity harder to verify. • Agriculture is practical, so learners must demonstrate skills in real workplaces. • Online systems need reliable ways to verify practical competence.
Online Learning and Vocational Agriculture	• Online learning has existed for decades but agriculture has been slow to adopt it. • Farming skills are practical and cannot be learned through theory alone. • Many learners and educators prefer a blended approach. • COVID-19 accelerated digital learning across the sector.
Technology and Learning Management Systems	• LMS platforms are now common in education. • Many organisations use LMS platforms mainly to store content. • Staff training and digital capability remain major challenges. • Online systems can improve access for rural learners. • Technology works best when supported by good course design.
AI in Education	• AI can help create content, provide feedback, and reduce workload. • AI skills are likely to become important workplace skills. • AI can produce convincing but incorrect information. • AI makes it harder to verify independent learner work. • Educators need AI knowledge and oversight.
Learner Engagement and Resistance	• Online learners can be harder to support and monitor. • Human support remains important. • Poor course design can reduce engagement. • Common barriers include: ◦ Limited digital skills ◦ Poor internet access ◦ Lack of time • Engagement improves when learners feel supported rather than isolated.
Learners in Agriculture	• Agricultural learners vary in literacy, digital skills, and confidence. • Many agricultural learners live far from training providers. • Isolation can increase the risk of disengagement. • Internet access remains a challenge in rural areas. • Learners often balance study with demanding farm workloads. • Flexible learning is important for rural learners. • Agriculture is sometimes viewed as a pathway for less academic students. • Secondary schools play a key role in attracting future learners. Secondary teachers often face resource and industry knowledge challenges.
Generation Alpha are Coming	• Generation Alpha has grown up with technology from birth. • They expect digital, interactive, and flexible learning. • They are comfortable with multimedia and expect rapid feedback. • The next generation may expect online learning as normal, not optional.

4.0 Methodology

To address the research question surrounding online learning in vocational agricultural training, a mixed-method approach was used combining literature, surveys, and interviews (Figure 6). In many ways, the project evolved into one large SWOT analysis of vocational agricultural training in New Zealand. I also used a PESTEL analysis to get an external threats viewpoint.

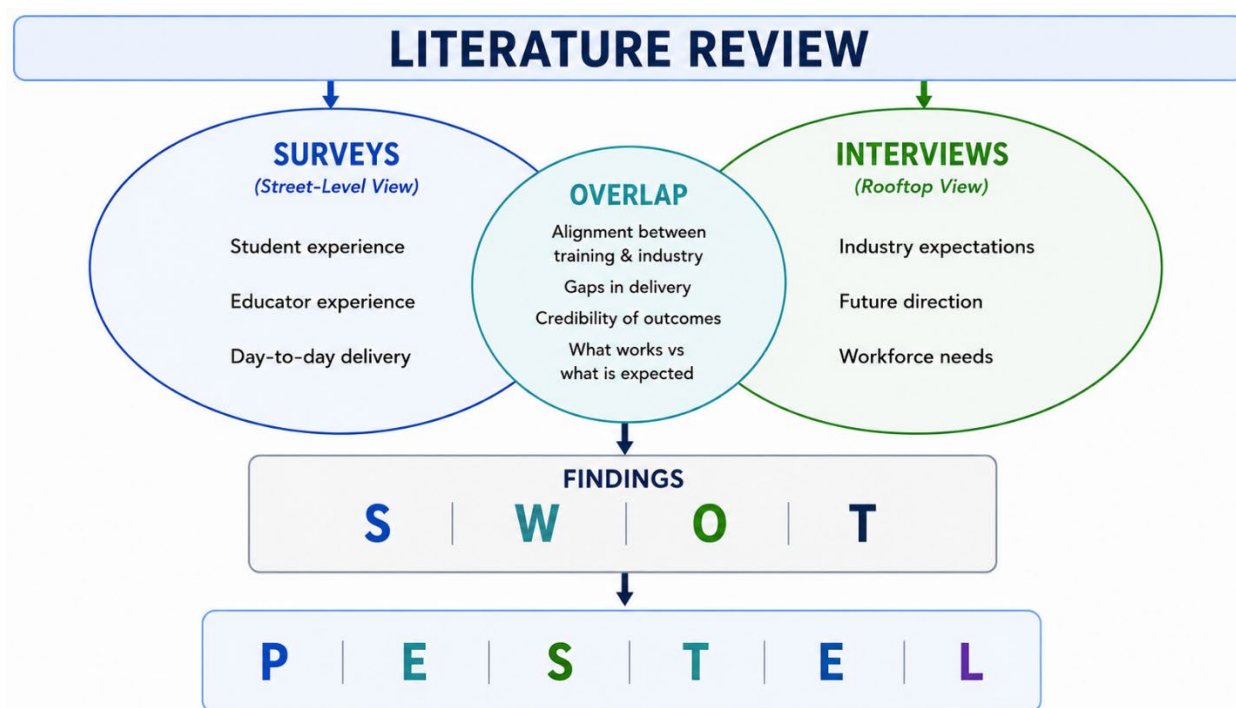


Figure 4: Mixed-methods research framework

4.1 Literature Review

The literature review was used to determine whether observed patterns were specific to my own experience or reflected wider trends in vocational education. Key themes identified included learner engagement, LMS design, competency verification, AI integration, and industry needs, which informed the survey design.

Given the small size of New Zealand's agricultural training sector, it was important to test these patterns against international research and across other industries. These findings were then tested within the New Zealand agricultural training context.

4.2 Research Design

The literature review was followed by a three-pronged research approach involving:

1. Students (online survey)
2. Educators (online survey)
3. Industry stakeholders (video interview)

Together, the methods provide two perspectives:

- Surveys with practical, on-the-ground experience.
- Interviews with industry-level expectations and future direction, rather than the operational delivery of training. These provided more of a helicopter view.

4.3 How the Surveys/Interviews Were Developed

Survey questions were based on themes identified in the literature reviewed, ensuring alignment with the research focus. The main areas measured were:

- Access and Connectivity – Rural internet access and technology reliability
- Learning Management Systems (LMS) – Use of LMS platforms for active learning
- Practical Competency Assessment – Observable performance and workplace evidence
- Engagement and Tutor Presence – Impact of design and interaction on motivation
- Artificial Intelligence (AI) – Benefits, risks, and educator readiness
- Industry Relevance – Alignment with digital transformation in agriculture
- Future and Generational Expectations – Demand for flexible, technology-enabled learning

A series of interviews were also conducted, and these were analysed using thematic analysis to identify common themes and patterns relating to online vocational agricultural education. Participation in both the interviews and surveys was voluntary, and all participants provided informed consent before contributing to the research.

4.4 Interview/Survey Limitations

This section outlines the key limitations of the survey and interview components of this research:

- About 200 survey requests were sent out to students directly by email. Participation was voluntary, creating potential self-selection bias.
- There was stronger representation from sheep and beef than dairy.
- The small number of agricultural tutors in New Zealand limits generalisations. A couple of strong voices could skew the results.
- In addition, the research is grounded in the New Zealand agricultural training context, limiting direct transferability to other countries or sectors.

While surveys provide breadth and interviews provide depth, neither method is fully comprehensive on its own, requiring careful interpretation of the findings.

4.5 SWOT and PESTEL analysis

A lot of information was coming forward and I needed a filing system otherwise I had a jumbled mess. I needed something that provided a structured way to analyse and organise complex information from multiple sources.

- SWOT analysis helps identify the internal strengths and weaknesses of online agricultural training, along with the external opportunities and threats that may influence its success.
- PESTEL analysis looked at the bigger picture. The period from 2020 to 2026 has seen significant upheaval within the tertiary education sector. Using PESTEL analysis provided an opportunity to place the research findings and survey feedback within a broader external environment context by considering political, economic, social, technological,

environmental, and legal factors that may affect the adoption and delivery of online learning.

Together, these frameworks helped move the project beyond simply reporting scattered findings. They allowed the findings from the literature review, surveys, and interviews to be analysed systematically, identify patterns and relationships, and support the development of informed conclusions and recommendations.

4.6 Use of Artificial Intelligence Tools

Diagrams and visual summaries within this report were generated using ChatGPT image generation tools to support presentation and communication of findings.

It was also used for proof reading and condensing text to meet word count requirements.

All interpretation, analysis, opinions, and conclusions remain the author's own. All written content and survey materials were reviewed, verified, and refined to ensure accuracy, relevance, and alignment with the academic and professional standards of the Kellogg Rural Leadership Programme.

5.0 Findings

This section presents the findings from the educator survey, student survey, and stakeholder interviews. The aim was not to produce deep statistical analysis, but to identify the major themes, pressures, frustrations, opportunities, and patterns emerging across the sector.

Survey data was collected using Qualtrics. The surveys were distributed online through industry and educational networks, allowing participants to complete the questionnaire electronically. Responses were anonymous and stored securely within the Qualtrics platform.

5.1 Student Survey Responses

Survey response rates were low despite a large number of invitations (350). I would like to point out that this outcome was not unexpected, as student engagement with surveys (particularly in online learning environments) is typically limited when there is no direct benefit for participation. As a result, the findings primarily reflect the views of those learners who were motivated to respond, and should be interpreted with this in mind.

I also kept these as industry-specific surveys (one for sheep and beef students and one for dairy), just to see if they differed in any area. The survey results themselves were generally amalgamated, unless something stood out.

The Respondents

- A total of 46 respondents completed the learner survey, comprising 8 dairy and 38 sheep and beef learners. All respondents had experience undertaking agricultural education or training that included an online learning component.
- Most sheep and beef students were younger (18 to 20 years) and studied levels NZQA 2 and 3.
- The dairy respondents' ages were more varied and studying at all levels.

Having this split was actually quite useful. There were clear maturity and career aspiration differences between these groups, and that likely affected the way they viewed the questions.

Access and Connectivity

- Connectivity and laptop or device access were not an issue.
- Most responses to these statements were generally positive, although views did vary across respondents, suggesting experiences may be influenced by individual situations or learning environments.
 - Logging into learning platforms is straightforward - passwords and authentications are easy to understand and manage.
 - I receive adequate technical support when needed.
 - Technical issues reduce my desire to study online.

Online Learning Experiences

- About half of respondents agreed that online learning suited farm work and seasonal pressures. The remaining were split between disagreeing and neutral responses.

- About half preferred face-to-face learning. The remaining were split to disagreeing or neutral.
- It was split 50/50 as to whether online learning felt isolating.
- Overall, half felt connected to their tutor and half did not.
- About a third would recommend online learning, a third would not, with a third undecided.
- Generally, dairy respondents were more positive about online learning. That might be a reflection that higher-level learners are more likely to choose online study voluntarily rather than rely on it simply to access training.

Artificial Intelligence (AI)

- Most dairy respondents used AI, whereas about half of the sheep and beef students use it.
- Not many trust AI-generated answers. That was quite clear.
- Most students felt that they had clear guidance in how to use AI when studying. They mostly understood the difference between AI-generated responses and AI-assisted work.
- Dairy farmers were more positive about AI use in their industry, with the younger sheep and beef students less sure. You would expect that, due to levels of exposure to AI in the workplace.

Engagement

- Staying motivated with online study was split pretty much down the middle. Half were motivated and half were not.
- Online learning as a study preference tended to be split as well. This question was asked slightly differently to an earlier question about studying online as a learning preference. However, it was more positive this time.
- Tutor presence is important for motivation in an online setting. That was almost unanimous.
- Most students were more likely to skip an online class than a face-to-face session
- Being uncomfortable in an online video call class environment and engaging in that class were also split down the middle. Some didn't mind and others were less comfortable. In comparison, the older dairy farm respondents were almost 100% comfortable.

Questions

A selection of responses was chosen that best reflected sentiment expressed in response to the question.

What do you like most about online learning?

- *Not having to travel long distances to attend class.*
- *Flexibility of when to do study (for the non-video lesson courses). No travel time, a 2-hour lesson, takes 2 hours, not 3 with getting clean and changed and half hour travel each way. Can sit in a comfortable chair with good temperature that helps me concentrate.*
- *People in remote areas, this would be a game changer. Great idea for this type of worker.*
- *I can focus more when I'm by myself.*
- *You can do the work whenever you want.*
- *Having all the content I need for assessments readily available at all times.*
- *Your able to do the assignments in your own time around work hours.*
- *Being able to learn from long distances. Instead of having to meet up all the time for a class.*
- *Not being in a group of people.*

- *It is well structured and set out, very helpful resources are readily available, and we have plenty of time to access these as we wish. Open book assessments rather than exams are much less stressful.*
- *It was convenient for fitting around work and you could join from just about anywhere.*
- *It doesn't disrupt my day as I can work around it.*
- *You can work from home.*

What frustrates you most about online learning?

- *Sometimes connection issues. Having trouble logging in. Technical issues.*
- *Using computers.*
- *If there's issues with power so you have little wi-fi and service.*
- *Takes time to receive feedback from tutors through emails rather than face to face.*
- *Harder to ask questions and have a discussion. Seeing myself in the camera. Video calls, video or sound glitching or being poor or slow, makes a conversation difficult.*
- *Not having the teacher present to help guide you.*
- *I have less self-accountability when its online. I enjoy going to a place of learning because I can then separate that place from my job and completely focus on what is at hand, however when its online I struggle to make that disconnect.*
- *I can't put it to practice or to see if I'm doing it right.*
- *I personally learn best with face to face and easily get distracted with online learning.*
- *It's harder to relate to others in the study group or get to know them on a personal level.*
- *Not having other people there with you to bounce ideas off.*
- *Probably not being around other cohort in person can feel lonely compared to being able to see them before and after class etc...*
- *Hard to keep up.*

Honest Reflections on Online Learning

In the table below, higher scores indicate behaviours or experiences that respondents felt occurred more frequently during online learning.

Table 1: Student Reflections on Online Learning Habits

Question: Please rate the following statements using the slider from 1 to 100, based on how often each statement reflects your behaviour. 1 = Never 100 = Always.	Average score
I log into an online class, but do not pay full attention to what is being taught.	51
I need more support when doing online learning.	42
It is too easy to cheat using AI.	30
I multi-task (phone, messages, other tabs, cook breakfast...) while the online class is running.	51
I skip an online class because I believe that I can catch up later.	43
I start assessments later than I should when studying online courses.	55
I lose focus during online class lessons.	64
I open other online apps or websites when an online class is running.	41
I ask questions when I do not understand something in an online session.	37
I have avoided participating in online classes by turning off my microphone and/or camera.	31
I do the minimum to get through an online course.	38

The strongest pattern coming through is not resistance to online learning itself, but difficulty maintaining attention, motivation, and active engagement over time:

- Loss of focus appears to be one of the biggest challenges.
- Multi-tasking and divided attention were also common.
- Procrastination was another strong theme.
- Learners appeared relatively hesitant to actively participate in online video classes.
- Interestingly, responses around AI misuse were lower than expected. That could suggest:
 - Students are being reasonably honest
 - AI misuse is not yet as widespread as feared
 - Respondents may not be telling on themselves

5.2 Educator Survey Responses

Educator responses were limited, reflecting the small pool of tertiary agriculture educators teaching online rather than low participation. While including horticulture may have increased the sample size, it was excluded to avoid skewing findings away from geographically isolated learners. I could also have included secondary school teachers, but their students are mostly face-to-face teaching style.

Given the small size of the sector, I think the findings actually provide a reasonable representation of tertiary level agriculture educators in New Zealand.

The Respondents

- Only 14 respondents.
- Generally older, with several years of experience.
- Most have over three years of teaching online.
- Face-to-face teaching still dominates as the main teaching style.
- Most teaching is done at NZQA levels two and three.
- Experience with NZQA moderation varied considerably, ranging from tutors with little or no moderation experience to those with many years of experience.

Learning Management System (LMS)

- Most respondents gave responses that showed that they were relatively confident and competent with their LMS.
- It was not so clear-cut when asked if their institution had provided enough training.
- There were mixed answers regarding using analytics in the LMS to identify disengaged learners. Maybe that could have been an issue with question interpretation or that some were unaware of this function in their LMS.

Online Vocational Delivery

- There was consensus that online learning suited geographically dispersed learners.
- Practical skill development is an area of concern by most.
- Responses were divided, with some participants preferring blended delivery and others believing fully online learning could be equally effective.

- Most agreed that it was harder to maintain tutor presence in an online classroom. This could possibly be why some preferred a bit of blended learning. That would be a way that ensured some student-to-tutor relationships were maintained.
- Most agreed that NZQA consistency requirements and moderation was not an issue.
- There were mixed reviews on whether online delivery increased documentation and auditability.

Practical Competency Verification of Students

- Most agreed that written assessments alone are insufficient in vocational contexts.
- There were varied responses to the following questions:
 - Video evidence is a reliable method of verifying skills.
 - Supervisor or trainer attestations are trustworthy.
 - Competency must be observed in authentic environments (i.e. in a farm setting).
 - Online delivery increases risk to assessment integrity.

Artificial Intelligence

- Most educators have responded that they are comfortable with AI and are using AI in their jobs.
- Few are using it for marking and feedback. The most likely reason is that they do not trust the answering abilities of AI yet. If we think back to NZQA consistency requirements then that trust will need to be there for educators to consider using AI for these tasks.
- There is mixed feedback around detecting AI-generated work by students. Not all educators felt confident in detecting AI-generated work.

Engagement and Behaviour

- Most agree that students are harder to motivate and that they disengage quietly with online learning.
- They also mostly agree that better systems increase student completion rates.
- Most are aware that Gen Alpha is coming and these students will have higher expectations around learning approaches.
- There is more variation in responses regarding learner resistance to online learning and AI tools.

Question Section

A selection of responses was chosen that best reflected sentiment expressed in response to the question.

What is the biggest risk of online delivery?

- *Depends on the structure of the course - if it is fully on-line, self-directed and a student does not understand what is expected of them they are likely to give up or consider themselves not capable if they cannot get instant access to a tutor to help them with their problem.*
- *That we slip into an unconscious habit of impersonalism.*
- *Being able to track student wellbeing, pace, micro-indicators for understanding, relationships with students to build relational trust and respect.*

- *Disengagement, not knowing your students well enough to be assured of the authenticity of the submitted assessment.*
- *Making it engaging, and keeping students motivated.*
- *Online delivery - some students do not have access to laptops and internet.*
- *Plagiarism. With assessments being in a digital format, students can just copy/paste answers from a variety of sources and claim the work as their own. This is much harder to do with handwritten assessments.*
- *The feedback to students is limited. They can disengage un-noticed. The number of distractions with a screen is too much. Students drift to social media rather than stay on-task.*

What is the biggest opportunity in online learning?

- *I have used on-line learning (Moodle) very successfully in the past as a revision tool preparing students for assessments. This was a very useful addition to face-to-face classes and helped students develop independent study habits.*
- *Reaching many.*
- *Isolated areas or small numbers in one region can still access learning.*
- *Reach a wide range of students across NZ - location is no longer a barrier.*
- *Flexibility*
- *AI integration - without doubt we are on the precipice of a major disruption in learning. AI is going to change the way we interact with knowledge. It will not need to be stored in our heads anymore. Instead we will adapt learning to be about finding answers, rather than remembering them.*
- *AI coach*
- *Able to work online anytime.*
- *Students can work at their own pace and revisit work.*

What safeguards are needed for AI use?

- *I believe students need training in the efficient use of AI so that it is an addition/extension to their learning, rather than taking the place of them putting in the effort required to study. Students need to understand from the earliest possible stage that the use of AI to write their assignments is not helping them in the long term.*
- *We must focus on those who are genuinely there to learn, you will always have a minority that tries to cheat.*
- *Education of how to use it.*
- *In 5 years, AI use will not be cheating it will be second nature.*
- *Students know what they can use and can't use. More education for educators or teachers on what is available.*

What would strengthen industry trust for online delivered qualifications?

- *Industry would have more trust in on-line qualifications if the content of the qualification was explained in plain language rather than hiding behind educational jargon!*
- *Qualifications are notoriously slow to change e.g. to reflect developments within industry or in response to legislation, which I believe could reduce industry confidence in the relevance of some qualifications.*
- *Multiple touch base points (assessments) to build a larger picture of the competency of the student.*
- *More of it. The farming industry only has to see a few more students graduating through the online system to see how well it could work.*
- *The proof is in the pudding. Industry will need to see that those who have earned the qualifications actually know their stuff.*

- *An understanding that theory and skills are different, and both are important to most learners. Online learning is a good way to learn theory and knowledge. Skills are probably best taught by employers, on the job under the watchful eye of skilled supervisors.*

Final question - Is there anything else you would like to add?

- *The biggest problem with online learning is the uptake from educators. Distance and online learning have been around for decades - why haven't we used it more before now?*
- *I had all of my lessons online for 3 years pre and post-covid. Students disengaged. I have now removed the access to the online class notes until the end of the year. Students IN CLASS do not pay attention if they think the notes are available. I discourage laptop use in class. Old school pen and paper- chalk and talk is better than laptops and online.*

5.3 Stakeholder Interviews

Interview data was collected from a range of industry stakeholders and training providers. To maintain confidentiality and encourage open responses, interviewee names and affiliated organisations have been withheld.

Interview data has been analysed and grouped into key themes using thematic analysis, rather than reported question-by-question. I used this approach to prioritise insight over repetition, and to allow for clearer identification of meaningful patterns across responses.

Supporting comments have been limited to those that best represent the key themes identified.

Current State of Ag Training

Fragmentation, limited teacher support, and a lack of resources in secondary schools have been identified in previous Kellogg research (Fa'atui, 2023). These issues were also reflected in interview responses, indicating they remain ongoing challenges within the sector.

Interview feedback highlighted pressure on training providers operating under constrained funding models. Comments relating to “bums on seats” and “tick-box” approaches suggest a perceived emphasis on participation and compliance, rather than depth of learning or capability development. Informal discussions beyond the scope of this research indicate that these concerns are also held by farmers.

Structural and funding settings were frequently described as restrictive and, in some cases, anti-competitive. Participants indicated that these conditions limit delivery flexibility, constrain programme growth, and reduce the ability to respond to demand. Several respondents noted strong learner demand, but identified system settings as a barrier to expanding access and delivery.

Fragmentation across the sector was a recurring theme, particularly at the secondary school level, where variability in delivery, access to funding, and resource availability was highlighted. Concerns were also raised around limited teacher support and inconsistent resourcing.

-
- *I have been a bit disappointed. A lot of training by the industry are driven to a large extent to getting bums on seats.*
 - *Personally, I find the tick box (what's required for theory wise in regards to vocational training) not challenging enough for students.*
 - *Lack of teacher support and resources (secondary schools)*

- *Fragmented. We have 500 schools doing different things.*
 - *Limited number of schools getting funding – why can't we get that?*
-

Work Readiness & Capability

Views on learner work readiness were mixed. Survey respondents were generally positive about training farms and one-on-one cadetship training, while interview participants reported that learner outcomes varied considerably between programmes and individuals.

A key theme was uneven capability at entry level. Some learners were described as work-ready at a junior shepherd level, while others were seen as lacking foundational skills. This inconsistency was often linked to differences in prior training experiences and educational background.

Literacy was identified as a contributing factor, with concerns that underlying gaps are difficult to address once learners reach tertiary training. Participants also noted that some learners develop strategies to “get by,” rather than fully engage with learning.

Retention was another concern, with comments indicating relatively high attrition rates within the first two years of employment. Capability and readiness for the demands of farm work would have been a factor, where independence and the ability to self-manage are critical. Farmers are not known for babying employees and they have an expectation that the job gets done.

-
- *Depends on the school and what they did.*
 - *People coming out of the training farms have produced some high calibre graduates – at a significant cost.*
 - *People aren't learning the basics.*
 - *Literacy – happens early and hard to pick up again. Kids are sneaking through and become skilled at getting by.*
 - *Aptitude and attitude. Having the right attitude makes up for a lack of aptitude, particularly in early employment.*
-

Online Learning

Feedback on online learning was generally moderate, with responses generally indicating acceptance rather than strong endorsement. What this suggests is that while online delivery is recognised as useful, it is not universally seen as a preferred mode of learning. For our geographically dispersed farm learners it might be their only way. They just make do.

That links into the next key theme about the role of geography. For many sheep and beef learners, particularly those in remote locations, online learning was described as a necessity rather than a choice. They have accepted that they will be online learners.

There was also recognition that online learning aligns well with the needs of emerging learner cohorts. Participants noted that younger learners are increasingly familiar with digital platforms and are likely to adapt more readily to online environments. In addition, the development of digital capability was seen as relevant for those progressing into farm management roles.

-
- *Mainly sheep and beef. Dairy is largely face-to-face. For some sheep and beef students its either that or nothing.*
 - *We are quite remote so travel is a major thing. It was once a month and it had to be well planned. Online works for us.*

- *Gen Alpha, coming from Google Classrooms, will fit in better with online delivery.*
 - *They (students) do what they have to do to gain their qualification.*
 - *Face-to-face has difficulties with student to tutor ratios. To make programmes viable you need a significant component of self-directed learning either blended or online.*
-

Engagement and Motivation

Engagement was closely linked to learner intent and career direction. Participants consistently indicated that students with clear goals or aspirations are more likely to engage, while those without direction are more difficult to motivate.

Literacy was identified as an ongoing challenge, often influencing both engagement and achievement. There is a broader issue, identified in previous research, where agriculture is sometimes positioned as a pathway for lower-performing students rather than a deliberate career choice (Rolfe, 2015; O'Sullivan, 2017). Where learners enter training without clear intent, and with existing capability gaps, the risk of disengagement increases.

Despite these challenges, a few participants emphasised that the majority of learners are capable and engaged. However, disengaged students tend to be more visible, which can distort overall perceptions of learner performance.

Engagement in online learning was seen as dependent on the individual. Some learners were described as being disengaged regardless of delivery mode, often due to prior negative educational experiences.

Learners were more engaged when content was clearly linked to career outcomes, easy to understand, and presented in a practical context. Conversely, disengagement was associated with content that was perceived as too abstract, repetitive, or overly theoretical.

Delivery format was also identified as important. Short, focused content, opportunities for peer learning, and recognition of progress (such as micro-credentials or badges) were seen as effective in maintaining engagement. In contrast, long written tasks and extended theory-based content were viewed as barriers for some learners.

The themes identified in this section reflect those found in the literature, particularly the link between learner motivation, prior experience, and engagement. The findings reinforce concerns that where agriculture is positioned as a default pathway, learner engagement is more difficult to sustain, especially when combined with literacy and capability gaps.

-
- *Young people are motivated to do the courses because they do see it to be important to their career progression.*
 - *It doesn't matter if it is online or face-to-face for some students. They have had a negative experience at school and they don't want to go back to school. It is like returning to prison.*
 - *They hate writing - you are basically asking a fish to ride a bicycle.*
 - *You got 20 minutes every lesson in them. Videos no more than 2-3 minutes.*
 - *Short questions and multi-choice or short paragraph answers. They are not ones for writing long stuff.*
 - *Education is much more than learning knowledge – it is the experience.*
-

Trust, Quality & Credibility

Trust in training quality was strongly linked to graduate outcomes. Participants consistently indicated that the credibility of a qualification is ultimately judged by the capability of the learners it produces.

While some confidence in online training was expressed, this was often conditional and varied between providers. A recurring theme was uncertainty around consistency, with participants noting that quality can differ significantly across programmes.

Concerns were also raised regarding qualification integrity, particularly where assessment standards may not be consistently applied. The perception that some programmes do not allow students to fail was identified as a risk to industry trust, with participants emphasising the importance of maintaining clear performance expectations.

Confidence in online training was closely tied to visible outcomes. Participants indicated that observing graduate performance in real-world settings is a key factor in building trust. In addition, the capability of those delivering and assessing training—particularly in practical, work-based contexts—was seen as critical to ensuring quality.

-
- *That depends on the training. Each school is different.*
 - *The honest answer is I don't know – I am a bit sceptical because in some courses nobody fails.*
 - *You need to see and evaluate the product (graduated students).*
 - *Obviously with AI it raises challenges with authenticity.*
-

Risks & Pitfalls

A key concern was the impact of emerging technologies, particularly the use of AI by students. Participants noted the risk of learners relying on AI-generated responses rather than developing their own understanding, raising questions about authenticity and depth of learning.

Uncertainty at a system level was strongly highlighted. Ongoing changes within the vocational education and curriculum space were described as creating a lack of clarity, with some participants indicating that the sector is in a holding pattern while structural changes are implemented.

One participant explicitly highlighted the need to make difficult decisions to remain financially viable, indicating this may be a wider concern not always openly discussed, especially where it may influence delivery quality. In this example, online learning was seen as the financial solution, not a decision driven by learning quality.

The disconnect between theory and practice was another recurring theme. Participants questioned whether learners are consistently able to translate classroom or online knowledge into practical on-farm or paddock application.

In relation to online learning specifically, disengagement was identified as a key risk. Participants noted that online assessments are often deprioritised by learners, particularly where accountability is low.

However, a contrasting view emerged, with some employers seeing online delivery as improving accountability and offering a practical alternative to “town day” training.

-
- *Funding. We nearly lost the curriculum last year.*
 - *We won't be seeing our direction till next year and not while Food and Fibre ISB is getting fully established.*
 - *We are in a holding pen for MOE curriculum and the vocational education space. We will not know anything for 3-4 months.*
 - *Financial pressure. You need more learners with less contact to be financial - one tutor with a bulk number of learners. There are concerns around that.*
 - *You don't get the impression that students get the learning from the textbook to what is happening in the paddock. Making practical sense of what you are learning in the classroom.*
 - *It is quite a big commitment to give workers every second Friday off to attend classes. There is a concern that a proportion of these workers see training days as a day off work. To some extent the online model does create more accountability, and in many ways is better for the employer.*
-

Opportunities

Standardisation of learning was identified as an opportunity, particularly in reducing fragmentation and ensuring more consistent outcomes across the sector.

Participants also indicated that smaller, targeted units of learning (modules) could make training more accessible and manageable, while still allowing learners to build toward full qualifications over time.

Funding equity was highlighted as an area for improvement. Concerns were raised about uneven distribution of funding across schools and providers, which contributes to variability in access and delivery quality.

A recurring theme was the need to strengthen the connection between theory and practice. Several participants noted that while technical content is being delivered, its application in real farm contexts is not always clear.

-
- *We would have to utilise systems better – make it easier to do small lots of training (modular). The system needs to be flexible. We can build towards a qual (modular) with smaller bits.*
 - *Funding is uneven. Some schools get plenty of funding and others get none.*
 - *It is being taught, but I don't know to what extent it is being applied in the paddock. Making it practical is the biggest challenge.*
-

AI in Learning

Respondents were clear that AI is now established and here to stay. What was less clear was how it should be managed. The speed of change means that adjustments often lag behind its development.

A dominant concern was the impact of AI on authenticity and trust. Participants questioned whether submitted work reflects the learner's own understanding, noting that students are becoming increasingly skilled at using AI tools to generate responses and avoid detection. There is reduced confidence in traditional assessment approaches from some respondents.

Regardless, AI is now seen as a tool that is now embedded in learning environments. Participants noted that younger learners are already engaging with these technologies and that, when used appropriately, AI can support efficiency and provide access to information.

A key theme by nearly all people interviewed was the need to adapt assessment practices. Approaches such as oral assessment, guided use of AI tools, and greater interaction between learner and tutor were identified as ways to maintain authenticity and support learning. The role of the tutor was seen as increasingly important in verifying understanding and guiding appropriate use.

Participants also identified potential value in AI for feedback and support, particularly in providing real-time responses. However, there was uncertainty about its role in developing deeper understanding, with some questioning whether it enhances learning or simply enables faster completion of tasks.

-
- *Gen Alpha will be really data driven.*
 - *How do we ensure students are actually learning, not just generating answers?*
 - *We do oral assessment and are using chatbots to work with the student.*
 - *I have yet to see evidence of it actually teaching – great for getting through assessment quicker. The kids are effective in copy paste from Chat GPT.*
 - *My kids are clever enough to ask Chat GPT to make spelling and grammar mistakes, and make it look bad - but still be correct.*
 - *It's a tool we can use increase efficiencies, but it is not the be all end all.*
 - *10% of all jobs now require AI use. This will only increase. We are entering a different world.*
-

System-Level Thinking

Participants expressed limited confidence in the current training system's ability to meet future needs. A consistent theme was the perception of an uneven playing field, with funding models favouring some organisations and limiting competition and innovation.

Cost and resourcing were identified as underlying constraints, contributing to variability in delivery and outcomes across the sector.

-
- *Unfortunately, all programmes require funding.*
 - *We can do better.*
 - *Our system is a hangover from Te Pukenga. Before it was not perfect, but it was better than the state it is in now.*
 - *We are always in a transition phase.*
 - *It is not a fair playing field. Some organisations are protected by funding models. Nobody else can compete with them.*
-

Future Direction

Views on the future of agricultural training were mixed, reflecting both uncertainty and opportunity.

Funding was consistently identified as a key influence on future direction. Participants indicated that current funding models may limit progress, with concerns that without a more equitable system, existing constraints will persist.

-
- *Could go either way.*
 - *Depends on what government is in. We have seen huge swings with Te Pukenga, then the destruction of it.*
 - *In its current state it worries me a bit.*
 - *We are in tricky times because there is lots of change happening.*
 - *Unless something changes with funding we will be in exactly the same place in 10 years. We are still doing the same things today we did 5 years ago.*
 - *The way organisations are funded. We need a fair playing field – not a protected one.*
-

5.4 SWOT and PESTEL Analysis Findings

This part of the project was not originally planned. However, the findings kept pointing toward issues bigger than online learning itself. The real challenge seemed to be how vocational education is responding to changing technology, AI, learner expectations, industry needs, funding pressure, and the growing demand for flexibility while still maintaining credibility.

To help make sense of these wider pressures, I used SWOT (Figure 5) and PESTEL analysis (Figure 6) frameworks to pull the findings together into a more coherent collection.



Figure 5: Author created SWOT analysis of this project



Figure 6: Author created PESTEL analysis of this project

6.0 Discussion

The main themes, in Figure 9, that emerged from the survey and interview findings, and what they may mean for the future of agricultural training in New Zealand, are covered in this section. The discussion follows the original project objectives and links the findings back to the literature and wider industry discussion.



Figure 7: Discussion points

6.1 Current Quality and Compliance Frameworks

The findings suggest that confidence in online agricultural qualifications remains strongly tied to quality assurance, moderation, and consistency of graduate outcomes. Educators generally believed NZQA consistency requirements could still be maintained within online delivery, although concerns remained around practical competency verification, assessment authenticity, and auditability.

Stakeholder interviews reinforced the idea that industry trust is ultimately based on graduate capability rather than delivery mode alone. The repeated theme of “seeing the product” highlighted that online qualifications must still prove learners can perform competently within real farm environments.

A recurring frustration from farmers and industry stakeholders was the perception that some parts of the vocational system have become overly focused on participation, retention, and funding protection rather than capability development. Concerns around “bums on seats” and “tick-box” training suggest industry confidence may continue to weaken if qualifications are not consistently producing graduates who can genuinely perform within the workplace.

In this context, the government's recent decision to remove Fees Free may help address some of the inequities that existed between funded and non-funded providers. It may also encourage learners and employers to place greater emphasis on programme quality, graduate outcomes, and value for money. If learners are making a financial contribution, providers may face greater pressure to demonstrate that their programmes produce capable graduates rather than simply high enrolment and completion numbers. This could expose delivery models that are financially or educationally unsustainable while rewarding providers that consistently deliver strong graduate outcomes.

The findings also suggest that moderation and assessment systems may need to evolve alongside AI and increasing online delivery. Traditional written assessment approaches appear increasingly vulnerable to authenticity concerns.

6.2 Online Learning Systems in Vocational Contexts

Online learning was generally viewed as useful and increasingly necessary within vocational agriculture, particularly for geographically isolated learners. However, support for fully online delivery remained mixed.

Students valued flexibility, reduced travel, and the ability to fit learning around farm work and seasonal pressures. Saying that, many still preferred face-to-face learning or blended approaches combining online delivery with practical interaction and tutor contact.

The findings suggest online systems work best when they are structured, interactive, and clearly connected to practical workplace application. Poorly designed systems appear more likely to contribute to disengagement, passive participation, and learner frustration. These findings are consistent with the literature, which highlights the importance of course design, learner engagement, interaction, and authentic learning experiences in online education (Edy et al., 2020; Kholifah, 2020; McHardy, 2023; Shaw et al., 2025).

6.3 Technology, Automation, and LMS in Education

Both educators and learners appeared reasonably comfortable using digital systems and learning platforms. Connectivity and device access were generally not seen as major barriers within this sample group. However, this finding differs from both the literature and comments from some educators, which identified rural connectivity and technology access as ongoing challenges. One possible explanation is that the learners who responded to the survey had better access to devices and internet services than the wider agricultural learner population, making this result somewhat unrepresentative of the sector as a whole.

Educators reported moderate to high confidence using learning management systems (LMS), although opinions differed on whether sufficient training and support had been provided by their institutions. Some responses suggested LMS platforms are still not always being used to their full potential, particularly around analytics and identifying disengaged learners before it is too late.

The findings reinforce that technology is only part of the solution. Learning quality appears to depend more heavily on course design, educator capability, learner support, and how easily learners can engage with the online environment.

6.4 The Role of AI in Education

Most respondents reported using AI tools, although confidence in AI-generated answers remained an issue.

The strongest concern was around authenticity, assessment validity, and whether submitted work genuinely reflected learner understanding. It was acknowledged that students are becoming increasingly skilled at using AI tools in ways that are difficult to detect.

Respondents also recognised AI as a permanent part of future learning and work environments. Several participants viewed AI as a tool that should be guided and incorporated into learning rather than simply banned.

The findings suggest vocational education may need to shift further toward practical assessment, oral questioning, tutor interaction, and authentic workplace evidence as AI use becomes more common. As a result, there may be greater emphasis on assessing what learners can actually do in the workplace rather than relying heavily on written assessments alone.

6.5 Learner Engagement and Resistance to Online Learning

The findings suggest that learner engagement remains one of the biggest challenges within online vocational learning.

Students commonly reported losing focus, multi-tasking during lessons, delaying assessments, and struggling with motivation. Educators similarly described quiet disengagement as difficult to identify and manage online.

Importantly, the findings suggest learners are not necessarily rejecting online learning itself. Instead, resistance appears more connected to:

- poor structure
- repetitive delivery
- weak interaction
- limited tutor presence
- difficulties maintaining motivation over time

Tutor presence emerged as particularly important. Students consistently valued visible support, practical explanation, and human interaction.

6.6 Understanding Agricultural Learners

The findings reinforced that agricultural learners are varied in age, confidence, experience, motivation, and educational background.

Many learners are balancing full-time farm work and family commitments alongside study, often within geographically isolated environments. There is quite a bit of pressure on learners between any learning opportunities (face-to-face or online) and the way they deal with time management, motivation to study, and poor connectivity issues. Maybe it is just too hard for some.

Stakeholder interviews also reinforced concerns around literacy, disengagement from previous schooling, and agriculture sometimes being viewed as an alternative pathway for learners who struggled within traditional education environments.

Many participants also pointed out that highly capable and motivated learners do exist within the sector. The issue appears less about learner intelligence and more about designing systems that maintain engagement, relevance, structure, and support.

Secondary School Education

A recurring issue identified through this research is the strength of the pipeline feeding into vocational agricultural education. Agriculture remains New Zealand's largest industry and a major contributor to the national economy, yet access to agricultural education at secondary school level remains inconsistent (Fa'atui, 2023). As a result, learners enter vocational training with varying levels of industry awareness, knowledge, confidence, and preparedness.

If the sector wants capable future farmers, managers, and agribusiness leaders, agricultural education cannot continue operating as a fragmented and uneven system. Greater national consistency, investment, and support are needed to ensure students across New Zealand have access to high-quality agricultural learning opportunities and clear pathways into vocational education and employment.

The sector cannot continue relying on passionate teachers alone to sustain agricultural education. Delivering modern agricultural programmes requires adequate funding, professional development, industry engagement, and access to quality teaching resources.

6.7 Generational Shifts and Emerging Learner Expectations

The findings suggest generational change will continue increasing pressure on agricultural training systems to modernise.

Educators and stakeholders recognised that younger learners are increasingly comfortable using technology, online platforms, and AI tools. Generation Alpha learners are likely to expect more interactive, flexible, and technology-enabled learning environments.

The findings suggest digital familiarity does not automatically translate into stronger engagement or self-management. Younger learners still appeared vulnerable to distraction, passive participation, and reduced concentration during online learning.

Future vocational systems will need to balance flexibility and technology with strong structure, practical relevance, interaction, and human support.

7.0 Recommendations

The findings from this project identified several recurring issues across online learning, vocational delivery, learner engagement, and wider system structures within agricultural training. The recommendations below focus on practical changes that may strengthen the quality, credibility, flexibility, and long-term sustainability of vocational agricultural education in New Zealand. While many additional recommendations could be made, the recommendations below focus on the area's most likely to improve learner outcomes, industry confidence, and the long-term effectiveness of vocational agricultural education.

7.1 Quality and Compliance Frameworks

The findings suggest New Zealand's vocational quality assurance and moderation systems are generally functioning as intended. Most educators appeared confident that NZQA consistency requirements can still be maintained within online and blended delivery environments.

However, industry confidence becomes vulnerable when funding pressures begin influencing delivery behaviour and assessment expectations. Concerns around "bums on seats" models, retention pressure, and qualification credibility suggest the wider issue may sit less with moderation systems themselves and more with the structural and financial settings surrounding vocational delivery.

- **Vocational training should be more contestable.** Where programmes are supported by public funding, smaller providers and new entrants should have the opportunity to compete alongside larger, established organisations. Funding should be linked to quality, capability, learner outcomes, and industry relevance rather than organisational status. Increased competition can encourage innovation, improve learner choice, and create greater accountability for results. Ultimately, providers should succeed on the strength of their outcomes rather than their size, history, or market position.

7.2 Online Learning Systems in Vocational Agriculture

Online learning appears well suited to the realities of farming, particularly for geographically isolated learners. For many rural students, especially within sheep and beef farming, online delivery improves access to training that may otherwise be unavailable due to distance, travel time, staffing pressures, and seasonal workload.

Online learning should therefore be treated as a permanent part of agricultural training rather than a temporary alternative to face-to-face delivery. However, to work well, online vocational delivery requires a strong tutor presence, good systems, and practical relevance to maintain engagement and credibility.

- **Develop a national online delivery strategy for vocational agriculture,** led by the Food and Fibre Industry Skills Board (ISB). It should include secondary schools and tertiary training providers. The strategy should support the development of purpose-built online programmes, shared digital resources, and consistent quality standards across the sector. Rather than adapting classroom programmes for online delivery, qualifications should be designed specifically for online learning and supported by specialised resources, practical examples, and learner support tools that enable learners to learn independently while maintaining strong links to workplace practice.

Pastoral care and strong learner support systems, such as those provided through the training farms (i.e.: Smedley, Pukemiro, Otiwhiti), Growing Future Farmers, and the Whangarei Agricultural and Pastoral Society, appear particularly important at NZQA Levels 2 and 3 where learner confidence, motivation, and engagement are often less developed. The problem is that pastoral care is not cheap. These organisations need financial support to ensure successful outcomes.

- **Recognise pastoral care as separate from programme delivery and fund it accordingly.** Training farms, cadetship programmes, and industry support networks play a critical role in learner engagement, retention, and success.

7.3 Technology, Automation, and Learning Management Systems

We are in the digital age and have technologies available to us, but are we using them properly? Greater investment is needed in educator capability. Many tutors are expected to teach online without formal training in online course design, digital engagement, or learning analytics.

- **Invest in tutor systems training** to ensure educators can effectively use digital platforms and deliver high-quality online learning experiences.
- **Get more value from the LMS.** Learning systems should be actively designed around engagement, interaction, feedback, and learner monitoring.

7.4 Artificial Intelligence in Education

AI is evolving faster than most education systems are designed to respond, making it difficult to prescribe too many fixed actions or long-term rules. However, AI should be acknowledged as a permanent part of vocational education rather than treated purely as a cheating problem.

- **Assessment design needs urgent review.** Systems heavily reliant on written assessment are increasingly vulnerable to authenticity issues. More use should be made of oral assessment, tutor questioning, practical verification, and repeated low-stakes assessment to confirm learner understanding.
- **Improve educator capability.** Educators also require significantly more professional development around AI tools, limitations, risks, and practical application within vocational education.

7.5 Learner Engagement and Resistance to Online Learning

Online learning systems should be designed around engagement rather than convenience for providers. Learners consistently identified human support and interaction as critical for motivation and persistence. Providers should recognise that passive disengagement online is harder to detect than in face-to-face environments. Regular check-ins and early intervention systems are essential.

- **Maintain a strong tutor presence within online programmes,** particularly at NZQA Levels 2 and 3, where learners often require greater guidance, motivation, and accountability.
- **Recognise pastoral care as an essential component** of successful online vocational education and ensure it is adequately funded and supported, particularly for younger and less experienced learners.

Long theory-heavy delivery should be reduced where possible. Agricultural learners generally respond better to practical, applied, and visually supported learning approaches.

- **Adopt a learner-centred approach** to online education. There are many ways to achieve this, but it ultimately comes down to good online pedagogy and designing learning around the needs of the learner rather than the convenience of the provider. This may require investment in educator capability, as effective online teaching requires different skills and approaches than traditional face-to-face delivery.

7.6 Agricultural Learners and Support Systems

Learners enter training with very different levels of literacy, confidence, digital capability, self-management, and previous educational experience. There needs to be greater recognition that many of these challenges developed long before learners entered tertiary vocational education. Tutors can support and guide learners, but they cannot be expected to fully resolve years of disengagement, weak educational foundations, or negative schooling experiences on their own.

- While these issues were raised by several participants, this project did not collect sufficient evidence to identify the causes or recommend specific interventions.

Too much variation currently exists between schools, often driven by individual school priorities rather than wider industry need. The sector needs a more standardised agricultural curriculum that reflects the realities of New Zealand pastoral farming rather than becoming diluted into overly generic science-based content disconnected from the farming workplace.

- **Treat agriculture as a core subject within the New Zealand school curriculum.** Every New Zealand student should complete at least one year agricultural training. As New Zealand's largest export industry, agriculture should be recognised as a priority learning area and receive funding, resources, teacher support, and curriculum development consistent with its importance to the country's economy and future workforce needs.

Industry should also play a stronger advisory role within secondary agricultural education. Greater collaboration between schools, industry organisations, and tertiary providers may help reduce fragmentation, improve programme relevance, strengthen learner pathways, and improve student understanding of agricultural careers.

7.7 Generational Change and Future Learners

As a member of Gen X, this is probably the section I find the most confronting. Who exactly are these learners, and what do we need to understand before they arrive on our doorstep? Let's face it, Gen Z already pushed many traditional teaching approaches to their limits, and now the goalposts appear to be shifting again with Gen Alpha.

Training systems need to adapt faster to changing learner expectations. Gen Alpha will expect flexible, digital-first, interactive learning environments because that is the environment they have grown up in. However, increased technology use should not come at the expense of human interaction, practical learning, or learner accountability.

Vocational education providers need to balance flexibility with structure. Younger learners may be digitally confident, but many still struggle with focus, self-management, and sustained engagement.

- I do not really have many recommendations here yet, other than to say “**listen to secondary school teachers**”. They are already dealing with Gen Alpha learners and are seeing these changes a few years before the tertiary sector does.

8.0 Conclusions

This project started with a question: how well does online learning actually work in vocational agricultural training, and what does this mean for delivering credible NZQA qualifications? After reviewing the literature, surveying students and educators, and interviewing industry stakeholders, several clear themes emerged:

1. **Online learning itself is not the main issue.** The bigger problems are learner disengagement, weak system design, inconsistent delivery, and outdated thinking around education. Poor online learning is often the result of poor structure and poor support, not simply because it is online.
2. **Online learning suits agriculture far better than many people admit.** Farming already operates around technology, remote communication, data systems, and flexible work environments. For geographically isolated learners, online delivery can remove major barriers around travel, cost, and access. For many rural learners, it is not a preference. It is the only realistic option.
3. **Flexibility alone does not create good learning.** One of the strongest findings throughout the project was that learners still need structure, tutor support, feedback, and interaction. Quiet disengagement was a major concern raised by both students and educators. Learners often lose focus, procrastinate, or drift away without anyone noticing early enough.
4. **Practical capability remains central to agricultural training.** Industry does not care how someone learned if they can genuinely do the job. Trust in qualifications still depends on observable workplace competence. Online systems must continue improving how they verify practical skills through authentic evidence, observation, questioning, and workplace assessment approaches.
5. **Artificial intelligence is changing education faster than the sector is prepared for.** AI creates opportunities for support, efficiency, and accessibility, but it also creates major challenges around authenticity, assessment validity, and learner independence. Traditional written assessments are becoming increasingly difficult to trust on their own. The sector will need to redesign assessment approaches rather than simply trying to block AI use.
6. **The wider vocational education system appears unstable and heavily influenced by funding pressures, reform fatigue, and fragmentation.** Concerns around “bums on seats” behaviour, uneven funding, and protected delivery models appeared repeatedly throughout the research. In the meantime, farming continues to modernise rapidly. In many ways, the agricultural industry now appears to be adapting faster than the training systems supporting it.

One last comment

After 30 years of farming, I have learned that you cannot control the weather, markets, or politics, but you can control what happens inside the farm gate.

Vocational agricultural education may need to apply the same mindset. The sector cannot stop technology, AI, changing learner expectations, funding politics, or wider system pressures, but it can decide how well it adapts to them. Online learning is here. What matters now is the quality of the systems surrounding it.

References

- Abernathy, D. J. (1999, September). *Online learning is good news for smart trainers and free agent learners. But where to begin? Here's some just-in-time help and a sampling of sites to rescue you from information overload.* Training & Development, 36–41.
<https://assets.td.org/m/3ea5164768a789df/original/Wwwonlinelearning.pdf>
- Ako Aotearoa. (n.d.). *A strategic review of professional learning and development in New Zealand's tertiary education sector: Summary report for tertiary education organisations.* Ako Aotearoa. <https://ako.ac.nz/assets/Our-publications/A-strategic-review-of-Professional-learning-and-development-in-New-Zealands-tertiary-education-sector-Summary-report-for-Tertiary-Education-Organisations.pdf>
- Al-Sa'di, A., & Ahmad, E. (2023). *The future of New Zealand tertiary education: Generation Alpha.* New Zealand Quality Research and Innovation. <https://nzqri.co.nz/wp-content/uploads/2023/04/The-Future-of-Tertiary-Education-Embracing-Online-Courses-and-AI-Tools.pdf>
- Coolsaet, D. (2024). *The Impact of Technological Advancements on Higher Education: A Study of Generation Alpha's Educational Prospects.* International Journal Software Engineering and Computer Science (IJSECS). 4. 58-67. 10.35870/ijsecs.v4i1.2147.
https://www.researchgate.net/publication/379995860_The_Impact_of_Technological_Advancements_on_Higher_Education_A_Study_of_Generation_Alpha's_Educational_Prospects
- Dahlstrom, E., Brooks, D. C., & Bichsel, J. (2014). *The current ecosystem of learning management systems in higher education: Student, faculty, and IT perspectives.* EDUCAUSE Center for Analysis and Research. <https://library.educause.edu/>
- Edy, D.L., Widiyanti, Basuki. (2020, September). *Revisiting the Impact of Project-Based Learning on Online Learning in Vocational Education: Analysis of Learning in Pandemic Covid-19.* In 2020 4th International Conference on Vocational Education and Training (ICOVET) (pp. 378-381). IEEE.
https://www.researchgate.net/publication/347447875_Revisiting_The_Impact_of_Project-Based_Learning_on_Online_Learning_In_Vocational_Education_Analysis_of_Learning_in_Pandemic_Covid-19
- Fa'atui, R. (2023). *Who's next? How is New Zealand's secondary school education system supporting the pathway to a career in agriculture/horticulture?* Kellogg Rural Leadership Programme. <https://ruralleaders.co.nz/report/whos-next-how-is-new-zealands-secondary-school-education-system-supporting-the-pathway-to-a-career-in-agriculture-horticulture/>
- Federated Farmers of New Zealand. (2025). *Rural connectivity survey 2025.* Federated Farmers of New Zealand. <https://www.fedfarm.org.nz/Web/Web/Resources/Rural-Connectivity-Survey.aspx>
- Food and Fibre Industry Skills Board. (2025). *Programme development guidelines for providers.* https://foodandfibreisb.nz/wp-content/uploads/2025/05/Programme-development-guidelines-for-providers_2.pdf
- Heath, S., et al. (2021). *Lecturers' experiences of the rapid transition to online teaching* (Unitec Research Report). Unitec Institute of Technology. <https://www.unitec.ac.nz/epress/wp-content/uploads/2022/12/2021-RS-p6-20-Heath-et-al.pdf>
- Johnston, J. P. (2020). *Creating better definitions of distance education.* Online Journal of Distance Learning Administration, 23(2).
https://www.researchgate.net/publication/343916952_Creating_Better_Definitions_of_Distance_Education

- Keesing-Styles, L., & Terrell, J. (2025, September). *Professional learning and development in Aotearoa New Zealand's tertiary education sector: Summary for tertiary education organisations*. Ako Aotearoa. <https://ako.ac.nz/assets/Our-publications/A-strategic-review-of-Professional-learning-and-development-in-New-Zealands-tertiary-education-sector-Summary-report-for-Tertiary-Education-Organisations.pdf>
- Kholifah, N., Irwanto, I., Ramdani, S. D., & Nurtanto, M. (2020, December). *Vocational Skills Learning Model Strategies During Covid-19*. In *Journal of Physics: Conference Series* (Vol. 1700, No. 1, p. 012092). IOP Publishing. https://www.researchgate.net/profile/Muhammad-Nurtanto/publication/348018849_Vocational_skills_learning_model_strategies_during_covid-19/links/5fed1703a6fdccdc81aeccf/Vocational-skills-learning-model-strategies-during-covid-19.pdf
- Ministry of Education. (2025). *Tertiary Education Strategy 2025–2030*. Ministry of Education. ISBN 978-1-75991-353-7. <https://web-assets.education.govt.nz/s3fs-public/2025-11/Tertiary%20Education%20Strategy%20-%202025-2030.pdf?VersionId=kaSBNy7noyUr0ZbRDPIsOg4SI5MR1fvq>
- Muir, B. (2010). *The future face of New Zealand's rural industry*. Kellogg Rural Leadership Programme. <https://ruralleaders.co.nz/report/the-future-face-of-new-zealands-rural-industry/>
- Muka Tangata – People, Food and Fibre Workforce Development Council. (2025, October). *Sheep, beef, and deer farming: Moderation report (July–September 2025)*. Muka Tangata. <https://mukatangata.nz/wp-content/uploads/2025/10/Sheep-Beef-and-Deer-Moderation-Reports-Oct-25-v2.pdf>
- New Zealand Qualifications Authority. (2020). *Assuring national consistency of graduate outcomes for qualifications at levels 1–6 listed on the New Zealand Qualifications Framework*. NZQA. <https://www2.nzqa.govt.nz/tertiary/quality-assurance/consistency/>
- New Zealand Qualifications Authority. (2023). *Distance online delivery (Version 2)*. NZQA. <https://www2.nzqa.govt.nz/assets/Tertiary/Approval-accreditation-and-registration/Programmes/distance-online-delivery.pdf#:~:text=For%20the%20purposes%20of%20this%20document%2C%20the,learning%2C%20web%2Dbased%20learning%2C%20extramural%20or%20virtual%20learning>
- OpenAI. (2025, August 13). *GPT-5 system card*. OpenAI. <https://openai.com/index/gpt-5-system-card/>
- O'Sullivan, D. (2017). *Primary Attraction: Understanding student awareness of primary sector career opportunities*. Kellogg Rural Leadership Programme. <https://ruralleaders.co.nz/>
- Pollard, L. (2018). *Remote student university success: An analysis of policy and practice*. The University of Western Australia. https://www.ncsehe.edu.au/wp-content/uploads/2018/07/LouisePollard_FellowshipReport_FINAL.pdf
- Primary ITO. (2026) *Guidance for Learners* [Video]. YouTube. <https://www.youtube.com/watch?v=mzoTSnjUE9U&t=67s>
- Primary ITO. (2026). *Tips and Tricks* [Video]. YouTube. <https://www.youtube.com/watch?v=xp0Y-8kvaMc>
- Purwani, A. T. (2024). *The benefits of learning management systems (LMS) in the effectiveness of administrative planning and learning implementation*. *Global Education Journal*, 3(1), 277–284. <https://doi.org/10.59525/gej.v3i1.894>

Rolfe, J. (2015). *Stoking secondary school students' interest in primary industry studies*. Kellogg Rural Leadership Programme. https://ruralleaders.co.nz/wp-content/uploads/2025/09/Rolfe_J_Stoking_Secondary_School_Students_Interest_in_Agriculture_Final.pdf

Roslin, A., Rahmatullah, B., Mohamed Zain, N. Z., Purnama, S., & Yas, Q. (2022). *Online learning for vocational education: Uncovering emerging themes on perceptions and experiences*. Journal of Vocational Education Studies, 5(1). <https://doi.org/10.12928/joves.v5i1.6097>

Shaw C., Dorn H., Martin S., Hay L., Janson N. and Bryant G. (2025). *Time for class 2025: empowering educators, engaging students*. Tyton Partners. <https://hdl.voced.edu.au/10707/699533>

Te Pūkenga. (2022). *Te Pūkenga moderation engagement document: Proposed moderation framework and transition plan* [PDF]. <https://www.nzist.ac.nz/assets/Our-Pathway/ADI/Moderation-framework/Te-Pukenga-Moderation-Engagement-Document.pdf>