

Final Report

Masterclass in Horticultural Business

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Tasmanian Institute of Agriculture

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Masterclass in Horticultural Business (LP15001)

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Public summary

Building human resource capacity and leadership in production horticulture is foundational to the ongoing success and growth of the industry in Australia. Future growth and prosperity of production horticulture will continue to rely on talented and adaptable leaders able to respond to changes by identifying and seizing new opportunities as they arise.

Many horticultural companies have identified a need for continued training of their key staff in skills relevant to their business. Tertiary training not only provides participants with a strong understanding of the horticulture systems they represent, but also trains people in critical and analytical thinking that enables those with natural leadership capacity to fully develop. As an identified obstacle to leadership development, this is now an imperative for the industry, given the level of formal training within horticulture is already low in comparison with the broader Australian community.

This project, which designed and delivered a Masterclass in Horticultural Business, targeted industry professionals through online learning with intensive face-to-face blocks of tuition. The Masterclass was developed in conjunction with Lincoln University, Wageningen Academy, Hort Innovation and industry leaders. This industry-focused and collaborative approach in education and training is consistent with the University of Tasmania's approach to research with impact. The project has:

- equipped participants with the leadership and management skills to underpin successful horticultural enterprises and industries
- addressed a skills gap to meet existing and the future needs of the Australian horticultural industry
- provided flexible delivery for distance participation
- fostered innovative and creative thinking, and engagement among participants
- communicated new knowledge and approaches to professional development that support the Australian horticulture industry through dissemination in professional and disciplinary conferences and publications
- produced a nationally recognised and accredited qualification at the appropriate AQF level.

Since its first delivery in 2017, 111 horticulture professionals have participated in the Masterclass. The development of a business plan and application of associated knowledge and skills (e.g., gross margin analysis) is consistently the most valued outcome of the Masterclass upon completion of the course and beyond. For many, the business plan developed continues to provide direction and inform investment for their company or organisation.

Graduates of the Masterclass, all of whom stated that they would recommend the Masterclass to their family and colleagues, are admirable advocates for the course to future students. The development of a strong reputation augers well for the expansion of the Masterclass both nationally and potentially internationally. These outcomes position the Tasmanian Institute of Agriculture at the University of Tasmania as the preeminent provider of nationally distinctive and tailored education and training programs for the horticultural sector.

Keywords

Leadership development; horticulture business training; horticulture management; masterclass; University of Tasmania; Tasmanian Institute of Agriculture

Introduction

In 2019-20, the total value of agricultural commodities produced in Australia was \$61 billion. Of this, horticulture was valued at \$9.6 billion, despite drought conditions (Australian Bureau of Statistics, 2021). The Australian Council of Deans of Agriculture (ACDA) and others have noted a skills shortage in agriculture, with annually about four jobs for every graduate (McSweeney & Rayner, 2011; Pratley & Botwright Acuña, 2015). More recently in 2019, it was estimated that there were still more than 2000 jobs in excess of university graduates (ACDA, 2020).

The horticultural workforce has a lower proportion undertaking formal training and education when compared with the broader agricultural sector. Building human resource capacity, business skills and leadership in production and processed horticulture is therefore of fundamental importance to the ongoing success and growth of this industry in Australia (Horticulture Innovation Australia, 2015).

Agriculture, and horticulture more specifically, are multidisciplinary. Knowledge and skills in agricultural economics and business management are acknowledged as essential for graduates if they are to provide the support necessary to maintain the competitiveness of Australian agriculture (Ag Institute Australia, 2014). Furthermore, advances in the industry are underpinned by business skills and innovation, usually through the implementation of new practices (Argabright et al., 2012).

Building capacity needs to focus on engaging the next generation of horticulturalists and providing opportunities for professional development of the current workforce. Informal professional development often takes the form of field days or other skills-based activities that have a basis in experiential learning, or learning by doing (Kolb, 1984) that is suited to adult learners that can build on their prior experiences. Often these learners lack formal training but have a wealth of life skills and experience. Formal qualifications would assist them to develop and expand their knowledge and capability. While there are formal qualifications available in horticulture including vocational training at Diploma and Bachelor level at some Australian universities, there remains a lack of formal training opportunities specifically for horticulture suited to professionals already working in the industry.

Greater engagement between universities and industry in curriculum design and cooperation between providers have been advocated as essential components of curriculum rejuvenation (Bellotti, 2012; Dunne, 2010). Drawing on industry expertise to deliver content is typical in higher education in agriculture, and is an example of authentic teaching practices (Oliver, 2010). Some examples in agriculture include dual sector degrees between TAFE and a university, or transnational education. There are however few examples of third-party delivery between the Australian tertiary institutions in agriculture.

In this project we combined the expertise in production horticulture (University of Tasmania, UTAS) with that of agribusiness (Lincoln, LU) in an AQF5 Diploma in Horticultural Business to benefit the industry and students. The framework for the Diploma was based on Wageningen University and Research's Academy for farmer education and training, which was contextualised to the Australian horticultural industry. This required considerable contextualisation due to the comparatively more complex horticultural system and the need to deliver online to provide broad accessibility in Australia than is found in the Netherlands, which was based a series of face-to-face workshops.

To address these issues, the Diploma, known also as the Masterclass in Horticultural Business (hereafter referred to as the 'Masterclass') was tailor-designed for Australian business managers and entrepreneurs in horticulture. The aims of the project were to:

- equip participants with the leadership and management skills to underpin successful horticultural enterprises and industries
- address a skills gap to meet existing and the future needs of the Australian horticultural industry
- provide flexible delivery for distance participation
- foster innovative and creative thinking, and engagement among participants
- communicate new knowledge and approaches to professional development that support the Australian horticulture industry through dissemination in professional and disciplinary conferences and publications
- produce a nationally recognised and accredited qualification at the appropriate AQF level.

Methodology

The project was undertaken in three phases:

- Phase 1 focused on the design of the Masterclass, where the course philosophy, learning outcomes, modes of delivery and modules were developed.
- Phase 2 evaluated the delivery of the Masterclass, and participants' attainment of the learning outcomes.
- Phase 3 was a longitudinal study that evaluated the impact of the course on the participants after graduation.

The UTAS Human Research Ethics Committee approved all research (H16252 in 2017/20; H23770 in 2020/21) undertaken during the project.

Phase 1. Development of the Masterclass

Led by A/Prof Alistair Gracie, UTAS worked closely with Hort Innovation, Wageningen Academy, LU and industry leaders to develop the Masterclass to meet workplace education and training needs. LU is well known for its flagship 138-year-old 'Advanced Diploma' where industry experience is a pre-requisite and on-job work training is a core part of the course.

Expertise that resided within the lead universities was drawn on to develop learning objectives, assessments and content for the Masterclass course, which were mapped against the Australian Qualification Framework and the Learning and Teaching Academic Standards for Agriculture (Botwright Acuna et al., 2014).

To help contextualise the overall course to the Australian horticultural landscape an independent review was undertaken by Professor Peter Oppenheim (agricultural economist and previous Director of the Deakin University MBA Program). Prof Oppenheim has extensive knowledge of the national and international horticultural industries as well as post graduate course design. This was then followed by a review of the course structure by the industry steering committee to further ensure the course targets industry needs. This was then followed by the development and implementation of student selection criteria to clearly identify prerequisite skills and knowledge necessary for student success.

The delivery mode included both on-line (webinars, podcasts, self-directed learning etc.) and targeted face-to-face intensives (regional or national workshops at key stages of the Masterclass). The UTAS online delivery platform called MyLO (My Learning Online) and the embedded web conferencing facilities were used to:

- enable real-time online lectures, tutorials, support, and group work for students in different locations
- facilitate communication and a sense of community among staff and students
- create a virtual office to consult with students
- enable guest speakers and external experts to deliver content
- connect participants to professional networks.

The Masterclass was delivered in eight modules that were five weeks in length, with a total duration of 40 weeks. Face-to-face intensives were held at the start, middle and end of the Masterclass. The final face-to-face activity included an integration of the course content and learning outcomes.

A Steering Committee comprising representatives from industry, Hort Innovation, Wageningen Academy, LU and UTAS was established to advise on course learning outcomes and objectives, and the appropriate modes of delivery. Membership of the steering committee was determined in collaboration with Hort Innovation to ensure suitable representation and appropriate Terms of Reference. The Steering Committee formed part of the official expert governance panel for the Diploma (i.e., the qualification), which was formally accredited by the UTAS Academic Senate in Dec 2016. Students who completed the Diploma can then receive a formal certificate (testamur) from UTAS at graduation.

The Diploma qualification was designed to enable articulation and credit arrangement to a 2-year Associate Degree (equivalent to Advanced Diploma) in Agribusiness or Applied Business. This created a viable and functional horticulture-focused course over the long-term.

Marketing and promotion of the Masterclass was undertaken by UTAS in collaboration with Hort Innovation. All parties involved including Hort Innovation, UTAS, Wageningen University and LU were fully acknowledged, and branding agreed to by the project Steering Committee. The intent of the marketing and promotion campaign were to build an effective brand to attract suitable students from a targeted market.

Having identified unique features and value proposition of the Masterclass, content was created for distribution through multiple media formats to reach the target audience, this including Search Engine Marketing, online ads, social media (e.g., YouTube, Facebook, Twitter), social referral, and traditional off-line advertising (print and news media) in addition to other relevant vehicles such as peak industry bodies and booths at major events such as Hort Connections.

The project team, teaching staff and industry representatives were invited to participate in a survey, conducted in 2017, to contribute their views and insights into the development of the Masterclass (Appendices 1 and 2). Survey questions considered the design of the Masterclass, its potential impact to the sector, appropriateness of the entry criteria and lessons learnt.

Phase 2. Delivery, quality assurance and improvement

The Diploma conformed to the Australian Government's Higher Education Standards Framework (Australian Government, 2015). This Framework includes requirements pertaining to course monitoring, review, and continuous improvement to ensure core standards such as governance, academic quality and integrity, effective assessments and achievement of expected learning outcomes are met. One unit equates to approximately 130 to 150 hours of tuition and individual and/or group study.

The Masterclass was delivered for the first time from February through to December 2017. This first and subsequent student cohorts were invited to participate in entry, mid and exit surveys. These surveys were designed to elicit their reasons for enrolling in the Masterclass and personal reflections on their achievements on completion. Student demographic data, including age, region, educational attainment, size, and scope of their horticultural business were also collected.

The participant information sheet and survey instruments used in Phase 2 of the project are provided in Appendices 1 and 3, respectively.

Phase 3. Longitudinal study of the impact of the Masterclass after graduation

In 2021, all graduates of the Masterclass were contacted to participate in an online survey on graduate employability. The participant information sheet and survey instrument used in Phase 3 of the project are provided in Appendix 4.

The survey was designed to elicit if graduates had changed their role, if they had implemented their business plan, the usefulness of the subjects since graduation, and the skills and knowledge used in their work that they attributed to the Masterclass. Like Phase 2, student demographic data, including age, region, educational attainment, size, and scope of their horticultural business were also collected.

Quantitative and qualitative data from all surveys was collated, with each participant allocated a numeric identifier e.g. 'S1' and analysed using mixed methods (Creswell, 2003).

UTAS undertook an Academic Transformation of all courses between 2020 to 2022, to enhance distinctiveness and simplify course architecture. It was decided to teach out the Diploma of Horticultural Business (AQF 5) and replace it with a Graduate Diploma of Agribusiness (Horticultural Business) (AQF8) with the first intake in 2021. A contributing factor is that students between 2017 to 2020, as horticultural professionals, had convincingly demonstrated their ability to succeed at university regardless of their educational background. Applicants who do not hold a bachelor's degree can apply for alternative entry based on five years of relevant work experience.

This enabled UTAS to build on the success of the Masterclass and add a new specialisation in Dairy Management to the existing Horticultural Business, with five core units completed by all students. Entry and exit surveys used in Phase 4 are as described in Phase 2. Ethics was updated to reflect the Graduate Diploma and revised National Statement on Ethical Conduct in Human Research.

Results and discussion

Phase 1. Development of the Masterclass

The Course Learning Outcomes (CLOs) are provided in Table 1. These have a basis in experiential learning (Kolb, 1984), or learning by doing, which is regarded as a valuable means of ensuring integration of knowledge with skills in agricultural education (Bauerle & Park, 2012; Knobloch, 2003; Roberts, 2006).

Each of the eight modules (Table 2) examines a range of current issues in horticultural business that are relevant to business owners and upcoming young entrepreneurs. Module topics and assignments are designed to promote interaction of the students with their staff (if they are business owners) or employers (if they work for a business owner).

Each module was taught in parallel with a co-requisite work-integrated learning module (Practice and Portfolio or P&P) of equivalent credit. In this way, the students applied their learning to their workplace through work-integrated learning (Patrick et al., 2008), raising questions and stimulating discussions about agribusiness.

Automatically assessed and graded quizzes with instant feedback provided at the end of each week of lectures tested knowledge and application. Three online assignments per module test understanding of theory and application. Three face-to-face block sessions situated in different regional locations were followed by face-to-face tours of farms and businesses that vary in structure and size. Each tour included talks by leading industry speakers and practitioners.

The regular input from successful industry entrepreneurs in the form of case studies and farm visits was a deliberate intention of course designers. For example, one academic stated; *'We have put a lot of effort into getting the right people from industry... to help frame the subject content and to deliver some of the material.'* External feedback by an industry-based steering committee on the learning outcomes, content and sequence of the modules was sought during the design process, to ensure it was contemporary and addressed current issues in the horticulture industry.

The design of the Masterclass for a national cohort of participants necessitated online delivery that was highly professional, flexible, and relevant to people working in the horticultural industry to foster innovative and creative thinking, and engagement among students. Content consisted of short video clips, interspersed with links to activities and resources. The use of digital technology in learning and teaching, consistent with contemporary norms in society, is one approach that caters to students who prefer or need to have ready access to information rather than through lectures (Prensky, 2001).

In designing the content, an academic stated that they were *'conscious that most people [are] doing this study on top of an existing workload so the [flexible delivery] is really important.'* The academics had relatively little prior experience in designing content for online delivery and stated, *'what we are delivering in this course is completely different to the content we are delivering [now]...which is basically face to face.'* Capacity building and professional development of the course design team in alternative delivery modes and techniques by engaging with educational technologists were instrumental in producing a quality online experience for students.

Intensive workshops were run in January, July and December in Victoria, Queensland, and Tasmania from 2017 to 2019. The face-to-face workshops and field tours were of high value to the participants, due to networking and the opportunity to follow up with academic staff on content.

The delivery of most of the face-to-face workshops in 2020 and 2021 were unfortunately interrupted by lockdowns and travel restrictions associated with COVID-19 and were replaced by virtual tours of horticultural businesses (where feasible) and online guest speakers. Nevertheless, these unforeseen circumstances received positive feedback. For example, a student in 2020 stated that *'overall considering COVID-19 restrictions staff organised a terrific workshop. The farm videos and live interviews were great. I think [this] style could be worked into the course. The discussion was fantastic.'*

The project steering committee met twice per year to provide guidance on curriculum development to ensure relevance. The committee also provided guidance on marketing the course to the appropriate audience.

Table 1. Course Learning Outcomes (CLOs) for the Diploma in Horticulture Business

On completion of the Masterclass in Horticultural Business participants will be able to:	
1	Identify, analyse, and reflect on personal and/or business goals and pathways for career/business development
2	Communicate contemporary knowledge of the principles of horticultural business
3	Apply business and entrepreneurial skills based on relevant theory within contemporary horticultural enterprises
4	Identify and articulate adaptable skills in the context of a dynamic horticultural business operating environment
5	Model the principles of sustainable horticultural business practice through ethical and professional conduct within a collaborative framework
6	Develop a business improvement plan within a local, national and/or international trading environment.

Table 2. Course structure of the Diploma in Horticulture Business. Each module was taught in parallel with a Practice and Portfolio module. Details of the face-to-face intensive is provided in Appendix 5.

Two-day face-to-face intensive, Mornington Peninsula, Victoria		
Term	Module	Sub-modules
1	1. Horticultural Management	1.1 Introduction to Horticultural Management 1.2 Risk management
	2. People and Culture	2.1 Organisation of Labour in Horticulture 2.2 Managing Human capital
2	3. Supply Chain Management and Logistics	3.1 Supply Chain Management 3.2 Value Chain Management 3.3 Logistics
	4. Financial Management and Law	4.1 Financial Management 4.2 Legal Issues in Horticulture
Two-day face-to-face intensive, Gatton, Queensland		
3	5. Horticultural Marketing and Communication	5.1 Horticultural Marketing 5.2 Communication
	6. Global Trends and International Business	6.1 Global Trends in Food and Horticulture 6.2 International Business
4	7. Innovation and Entrepreneurship	7.1 Innovation in Horticulture 7.2 Entrepreneurship in Horticulture
	8. Business Development and Strategy	8.1 Business Model Improvement
Two-day face-to-face intensive, around Hobart, Tasmania		

The Graduate Diploma was first introduced in 2021. The Course Learning Outcomes (Table 3) and units (Table 4) were revised to align with the higher order knowledge and skills expected of an AQF8 qualification. The Graduate Diploma has a minimum duration of one year, and a maximum of three years to facilitate part time study. All units are offered in both half year periods 1 and 2.

Table 3. Course Learning Outcomes (CLOs) for the Graduate Diploma in Agribusiness (specialisation)

On completion of the Graduate Diploma participants will be able to:	
1	Evaluate production and performance data within an agricultural or horticultural business to make timely, prudent, and informed decisions
2	Assess current business operations and performance strategies to ensure long-term profitability and sustainability in agricultural or horticultural businesses
3	Develop creative and strategic solutions to dynamic agricultural or horticultural business operation challenges
4	Explain internal business operations and industry wide matters to diverse audiences
5	Lead self and others effectively within relevant professional, ethical, and legal frameworks for sustainable business enterprise

Table 4. Course structure of the Graduate Diploma in Agriculture (Horticulture Business). Face to face intensives are offered at the start (Mornington Peninsula, Victoria), middle (Gatton, Queensland) and end (around Hobart, Tasmania) each year.

Unit	Sub-modules
1. Leadership, People and Culture*	1.1 Organisation of Labour in Agribusiness 1.2 Managing Human capital
2. Agribusiness Financial Management*	2.1 Financial Management of Agribusiness 2.2 Legal Issues in Agribusiness, and risk
3. Global Trends and New Market Opportunities*	3.1 Global Trends in Agribusiness 3.2 International Business
4. Agribusiness Innovation and Entrepreneurship*	4.1 Innovation in Agribusiness 4.2 Entrepreneurship in Agribusiness
5. Horticultural Business Management	5.1 Horticultural Business Management
6. Horticultural Value Chains and Logistics	6.1 Supply Chain Management 6.2 Logistics Value Chain Management
7. Horticultural Marketing and Communication	7.1 Horticultural Marketing and Communication
8. Agribusiness Development and Strategy*	8.1 Business Model Improvement

*Core unit, taken by all students in the course.

Phase 2. Student perspectives on the Masterclass

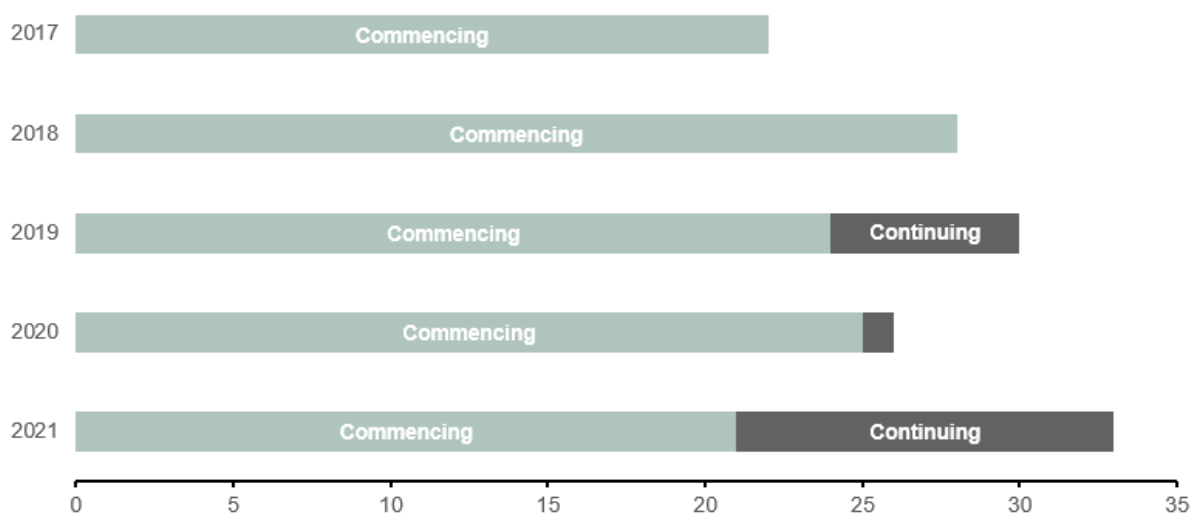
Student enrolments, graduations, and demographics 2017 - 21

The Masterclass has attracted 111 enrolments since 2017, representing a range of industry professionals in horticulture from across Australia, in the vegetable, nursery, fruit and nut industries, with some operating in several areas along the horticultural supply chain.

Across all years of the project, owners or part-owners of a horticulture business and senior managers of horticultural businesses tended to predominate (>50%) the Masterclass cohort. These were followed by horticultural consultants, suppliers of inputs for horticultural production, and logistics and supply chain management. Most participants (around two-thirds) were between 25 to 45 years of age. Overall, around 60% of students had completed a qualification equal to or higher than a Diploma.

In total, 77 students graduated from the Masterclass as of December 2021 and 12 students continuing their study into 2022 as provided in Figure 1.

Figure 1. Total commencing and continuing students in the Masterclass (2017 to 2021)



Personal goals of students at the start of the Masterclass

In the entry survey, most respondents across all years stated that they wanted to improve their business skills and develop a business and strategic plan, for example, they said; *'[I want to] learn new skills that I can put in place in my business; help improve [our] current business plan; learn about other horticultural businesses and see the strategies they use.'*

Other goals stated by students related to networking opportunities, professional development leading to career progression or the development of leadership skills *'Career progression, improvement of leadership of management skills, get insights from colleagues within the industry, brainstorm, build a good network.'*

In 2021, nine students were admitted to the Graduate Diploma (Horticultural Business), and all elected to study part time. There were only two respondents to the 2021 entry survey, both of whom were owners or part owners of a horticultural business. Most businesses employed between 1 to 15 people, with one mixed perennial horticulture/dairy enterprise employing up to 50 people. Reasons for undertaking the Graduate Diploma were like those previously reported e.g., *'Improve my business operations and co-ordinate a multi-faceted approach to business.'*

Students' reflections on the Masterclass delivery and content

At the end of the program, all students indicated that the relevant curricula had been addressed to meet their expectations. For example *'I think [the program] provided a good level of overview. Obviously, other areas can be explored in greater detail, but this course provides a good stepping point' and 'I believe the course content was interesting and covered all relevant areas of horticulture.'*

Components of the curricula that were reported as more interesting and enjoyable included, for example, preparing business plans, value chains, marketing strategy and finance, to name a few. Typically, these were related back to the participants business, for example *'Supply and value chain management - I enjoyed this section because it made me reflect on where our business is positioned. Marketing strategy – I found this interesting because again it was directly relevant to my business and provided me with potential strategies.'*

Balancing work, study, and family

Several students reported that they required between 5 to 10 hours per week to complete the study requirements of the Masterclass. One participant stated that; *'To do the assignments justice, I need more than 10 hours when they are due.'*

Indeed, student feedback indicated that fitting the course alongside their business cycle or other commitments was at times challenging, particularly in the peak production period around September to November. *'[The] only problem was a massive spring season coinciding with the end of the course. Not enough hours in the day.'*

In contrast, one participant stated after the completion of Module 2 that *'Time to do the coursework isn't actually that demanding. Where I have spent most time is trying to apply what we have learned directly to my business (i.e. gross margin, cash flow planning).'* Unlike the previous respondents, this student is integrating their study with their work activities. In doing this, the respondent is 'closing the loop' on their learning and putting it into practice. This is not to imply that the other respondents, noted above, were not necessarily doing this too.

Another student stated that the lecturers were flexible about deadlines *'I found it difficult to fit the requirements of the course in with my work and family life. It was very helpful that the lecturers were very flexible about deadlines.'* It is unclear to us whether this concession is limited to unanticipated events in the students' lives or is more liberal. There are potential issues around equity and a potential need to reinforce time management skills (Trueman & Hartley, 1996). Providing potential and current students with explicit advice on the time required to undertake the course could mitigate against, but not eliminate these issues.

The difficulties the students expressed in balancing their work, study and family (Allen, 2001) lives is typical of busy professionals who return to study. Unlike other qualifications, the Masterclass was initially offered full-time. The rationale for full-time study was to maintain the students as a cohort to promote their collective professional networks, although the resultant time commitment was perceived by some students as an issue.

In acknowledgement of the issue, an option for mid-year entry and part-time study were introduced in 2020. This approach may better suit students who need to balance multiple and at times, conflicting roles.

Student learning outcomes

Students were asked mid-year if their personal goals had been met through the course to date. Typically, respondents to the survey stated that they were reflecting on their personal skills and attributes in the workplace, for example *'I am analysing my management style and business skills.'* Other respondents had similar observations but in the context of the wider horticulture industry, for example *'reviewing my skill set and employability, reflecting on industry and how to improve my job, farm and industry.'* These observations align with CLOs 1, 2 and 3 (Table 1).

At the end of term 3, Module 6: Global Trends and Internationalisation, the concept of critical thinking and problem solving is introduced (Porter, 2008; Porter, 1979). Earlier in the Masterclass, students apply knowledge on agribusiness to their own business and personal situation. However, in this module students develop an export plan and strategy for new markets. Some students challenged its relevance; *'...export strategy... was not directly relevant to my business. Some of the legal aspects were the same as well. However, I could see that all the units were relevant to horticultural business.'*

Critical thinking and problem solving are then applied in the final two modules, one on Innovation and the last on Business Planning. Students are introduced to some of the nation's leading entrepreneurs and can draw learnings from the provided content and activities for application to their own businesses. It is from this point that students will develop the confidence to move to the final assessment task.

In the final assessment, which the Masterclass builds towards, students prepare and present a business plan to the class, academics, and leading industry representatives. This high impact learning experience consolidates the curriculum and is aligned with CLO 6 (Table 1). This task has two major learning outcomes and deliverables namely, a written business plan and secondly an oral presentation demonstrating clear and convincing communication skills. It is assessed using four criteria.

1. delivery of a business plan which is concise and easily understood, with logical and convincing argument
2. application of knowledge learned from participating in the Masterclass, covering most modules and application of this within their business plan
3. communication and delivery of a clear and concise business plan with overheads and other supporting material, and
4. demonstration of leadership skills within the horticulture sector by articulating aspects of vision, inspiration, entrepreneurial skill and innovation.

All respondents in the surveys stated that they intend to or had applied their plan to their own businesses, for example, *'[I] went over whole of business plan and reviewed the document as well as staff roles and future direction.'* Some students were business managers, rather than owners, but likewise stated an intention to act on their learning (McSweeney & Rayner, 2011), for example *'I am going to present my business plan to the owner of the business and outline my vision for the future.'* At the time of preparing the final report there were no graduates of the Graduate Diploma in Agribusiness and hence no exit surveys are available for this cohort.

All respondents indicated that they would recommend that colleagues take the course, for example *'I would like all my personnel in my organisation to complete the course.'* This raises the question of how graduates implement their plan and whether their experience led to any changes in how they approach ongoing professional development, or lifelong learning.

Phase 3. Longitudinal study of the impact of the Masterclass after graduation

Lifelong learning is defined as learning that is pursued throughout life and allows graduates to make responsible decisions and take appropriate actions to maximise their own learning (Zimmerman, 1986). Lifelong learning crosses sectors, promoting learning beyond traditional schooling and throughout adult life (Delors, 1996). A longitudinal study of the graduates from the Masterclass was required to address this question at the start of 2021.

All graduates were contacted, and 14 responses were received with four from the 2017 cohort, three from 2018, six from 2019 and one from 2020. Of these, 50% of respondents were business owners, while the remainder were senior managers of a horticultural business. Four businesses produced annual crops, two were in the nursery industry and two in perennial horticulture. Most businesses employed between 1 to 15 staff (53%) and only one had up to 250 employees. Four respondents had moved to a more senior role in the business since graduation.

Ten of the respondents implemented all or some of their business plan within a year of graduation, for example *'I wrote the business plan for the existing business with the aim of locking in the culture and making it clearer for new staff. This is something we live by every day and assist decision making.'* One respondent stated they pivoted their business during COVID-19 through value-adding that they had proposed in their business plan *'We would normally sell our watercress as a garnish for catering companies, cafes etc. to the markets, however as they shutdown (due to Covid-19) we had an excess of product which we needed to shift. We started packaging it in a bag as per the business plan and we were able to sell a very small amount of it.'*

Three respondents stated that their business had increased profitability, which they directly attributed to the course and implementing their business plan. For example, one graduated reported a 25% growth in their business by changing their management structure, value adding and altering the proportion of crops grown.

Graduates were asked what skills and knowledge they used in their work that they could directly attribute to the Diploma. For some, the Diploma reinforced and refined their existing knowledge to be more industry relevant and

stated that they felt more confident in their business skills. Others acknowledged the rapid rate of technological change, which meant that some of the information was now less relevant, but they had more confidence in business planning, for example *'Knowledge was good but (it is) replaced very quickly with new developments. The biggest gain was an increased comfort around tackling bigger questions within our business, improved research, and processing skills.'*

Some graduates did not implement their business plans. Various reasons were supplied, such as it was not feasible, or that they had opted to work as an employee. Regardless, they still reported improved skill in using the financial calculations and a greater understanding of the horticultural industry. Overall, the feedback was positive and is summed up by the following *'Fantastic program - flexibly of timing to work on material around work is a great fit, loved face to face...Great mixture of subjects/units with good practical examples. I would value an alumnus to continue relationships.'*

Table 3. Course Learning Outcomes (CLOs) for the Graduate Diploma in Agribusiness (specialisation)

Outputs

A list of project outputs is provided in Table 5.

Table 5. Output summary

Output	Description	Detail
Diploma of Horticultural Business	Course and unit information for students on the course aims, structure, entry requirements.	Was available on the UTAS Course and Unit Handbook, 2017 to 2020, now archived.
Graduate Diploma of Agribusiness (Horticultural Business)	Course and unit information for students on the course aims, structure, entry requirements.	Refer to UTAS Course and Unit Handbook https://www.utas.edu.au/courses/cse/courses/s6e-graduate-diploma-in-agribusiness-specialisation
Online delivery of units	Units are delivered through the UTAS Learning Management System, MyLO, inclusive of content, assessments, and grades.	Online content is only available to enrolled students. Unit delivery was evaluated via student surveys (refer to Appendices).
Face to face sessions	Masterclass students participate in three face-to-face tours as part of their course, typically held in Victoria, Queensland and Tasmania. These two-day tours are hosted by several horticultural businesses in the region.	Typical schedules of the face-to-face sessions are provided in the Appendices.
Graduates	Graduands (77 as of 21 January 2022) are listed in the UTAS Graduation Ceremony Booklets, held in August and December 2018 - 2021.	Booklets are available to graduands and their guests who attend the ceremony. Hardcopy only.
Conference proceedings	Australian Conference on Science and Mathematics Education, 26-28 September, Adelaide in 2018; and the Agricultural Education Symposium, Adelaide in 2018. 30 th International Horticultural Science, Istanbul, Turkey in 2018	No link available.

Journal article	A paper was published on the Design and Delivery of a Masterclass in Horticultural Business in 2019.	International Journal of Innovation in Science and Mathematics Education, 27(4), 88-96
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Outcomes

The desired outcome of this project was to increase the retention and progression of existing employees and business owners in horticulture through advanced level training and education. This project has delivered against this objective by designing and delivering a Masterclass in Horticultural Business, and the examples presented in Table 6 provide evidence of the project impact to the sector.

Table 6. Outcomes of the Masterclass in Horticultural Business

Outcome	Alignment to fund outcome, strategy and KPI	Description	Evidence
Increased retention and progression of existing employees and business owners in horticulture through advanced level training and education	CSI Leadership Fund – 1 Retain Existing Employees (An increased pool of professionals with the leaderships skills required to adapt to industry change)	The introduction of a new higher education qualification: Diploma in Horticultural Business, at the University of Tasmania	The Diploma was approved by the University of Tasmania's Academic Senate in 2016
		Investment from industry to support students with 73 scholarships, totalling \$730,000	Additional scholarship support was provided by the following industry sectors: vegetable, nursery, cherry, apple and pear, summer fruit, onion, potato, macadamia, and banana.
		Development of a Graduate Diploma in Agribusiness, with specialisations in Horticultural Business at the end of the funding agreement with Hort Australia. Indicates ongoing UTAS support and commitment to agricultural training of professionals from industry	The Graduate Diploma was approved by the University of Tasmania's Academic Senate in 2020
		111 participants from across Australia participated in the Masterclass to date, which equipped them with business and	Enrolment data held by the University of Tasmania.

		science skills	
		77 participants graduated with the Diploma in Horticultural Business between 2018-21.	Academic transcripts from the University of Tasmania include graduation date, and is reported to the Australian Government
Increased leadership across the industry	CSI Leadership Fund – 2 Promote careers in horticulture (An increase in the number of new entrants with leadership capability)	Students creating a positive impact on colleagues and the industry by applying skills developed in the Masterclass	Typical student experiences are noted in the student case studies provided in the appendices
Staff equipped with the necessary business and science-based skills to adapt to the changing demands of industry and to seize new and emerging opportunities	CSI Leadership Fund – 3 Drive research innovation (An increased number of researchers working on innovative transformational research to drive global competitiveness)	Participants during and after the Masterclass have implemented their business plans	Qualitative feedback from participants in Masterclass surveys
An alumni network of emerging and future leaders within horticulture that are globally focused	CSI Leadership Fund – 1 Retain existing employees (An increased pool of professionals with the leaderships skills required to adapt to industry change)	77 participants graduated with the Diploma in Horticultural Business between 2018-21.	Enrolment and graduation data is held by UTAS.
		Alumni actively supporting each other in ongoing education activities	Closed Facebook group established by alumni to maintain contact and expand networks
Growth of the horticulture industry driven by an innovative, skilled, and globally focused workforce	CSI Leadership Fund – 2 Promote careers in horticulture (An increase in the number of new entrants with leadership capability)	Participants during and after the Masterclass have implemented their business plans	Qualitative feedback from participants in Masterclass surveys and student case studies provided in the appendices

Monitoring and evaluation

UTAS, as a self-accrediting provider of tertiary education, which approves and subsequently undertakes a continuous cycle of quality assurance and improvement of all its educational offerings. This documentation, together with the responses of participants to the surveys outlined in the methodology, and the guidance of the industry steering committee, provided the basis for monitoring and evaluation of the project.

Table 7. Project key evaluation questions and evidence

Key evaluation question	Project performance	Continuous improvement opportunities
To what extent has the project developed a new Masterclass in Horticultural Business?	The Masterclass was designed to address the lack of university-level qualifications in horticultural business management in Australia, and to upskill busy professionals who were already working in the sector but lacked business acumen.	Course and unit design is evaluated annually as part of the UTAS quality assurance framework, and approved changes implemented in the next delivery.
	The UTAS Academic Senate approved the Diploma of Horticultural Business (Table 2) in 2016, which admitted students between 2017 - 2020.	
	The UTAS Academic Senate approved a Graduate Diploma of Agribusiness (specialisation) (Table 4) in 2020, which admitted students from 2021. The new course replaced the Diploma, which went into teach out.	
	Students provided positive feedback on their qualification <i>'after this course I am many times more confident in myself and my abilities within the business within the Horticultural sector. I feel confident that my business now has numerous advantages over leaders who have not reached this level of education.'</i>	There may be opportunities for e.g., short courses to maintain the currency of Masterclass participants into the future.
To what extent has the project upskilled the business knowledge and skills of horticulture industry professionals?	The final business plan in the capstone unit, 'Business Development and Strategy' integrates the knowledge and management skills developed by students throughout the Masterclass. For example, one student stated <i>'I have continued to improve relevant processes and systems in the business throughout the course as material is covered. I intend to use the business plan as the goals and roadmap for the company for the next 3</i>	The longitudinal survey (refer to appendices) provides an opportunity to evaluate the longer-term impact of the Masterclass on graduates, inclusive of suggestions for further improvement in course content and delivery.

	years.'	
	Several students and/or graduates stated that they had applied their business plan either during or after the completion of the Masterclass, demonstrating an improved capacity for leadership and decision making. For example, <i>'towards the end of the course it really made me want to pursue my business goal. It allowed me to calculate whether it was the right decision and goal to pursue as I had all the correct techniques and strategies.'</i>	
How many horticultural industry professionals have participated in the project?	In total, 111 students participated in the Masterclass, with 77 graduates as of February 2022. This provides evidence of the uplift in qualified personnel and managers with business skills in the horticultural sector.	There is still significant scope for other horticultural professionals to participate in the Masterclass. It will be important to ensure that the program is marketed widely. UTAS is also exploring opportunities to expand the program to an international audience.
How accessible was delivery of the Masterclass for participants?	The Masterclass was offered online, thus providing flexible study options for students around their business and family commitments. This mode of delivery was supported by three face-to-face sessions in a range of Australian locations, which provided an opportunity for active learning and networking.	Online delivery is continually monitored against the UTAS framework for Digital Delivery, and improvements incorporated into the next delivery.
	Although face-to-face activities were replaced with virtual tours at the height of the COVID-19 pandemic, even these were received positively <i>'the virtual tours were a great activity as it gave us a better understanding on how other businesses operate and how we can cater their practices to our own business.'</i>	
	Feedback during delivery indicated that some students nevertheless struggled with the timing of assessment in relation to their production cycle of their or their employer's horticultural business. In response, an option for mid-year enrolment and part time delivery was introduced in 2020.	Student participation and attainment is monitored by the university, and further interventions will be considered as required.

	Students can now study part time over 3 years or full time over 1 year. This approach provided more scope for students to tailor their learning to their business and family commitments.	
What efforts did the project make to improve delivery of the Masterclass?	Students were invited to participate in entry and exit surveys as part of the monitoring and evaluation process, which informed a continuous cycle of improvement of the Masterclass. Examples of changes made include: Alignment between intended learning outcomes, assessment and learning activities/content was amended in some units Additional examples of horticultural business were included in the units Financial Management and Law, and Supply Chain Management The quality of videos and recordings was improved by working with a professional videographer The sequence of learning materials was modified in some units Technical issues that sometimes affected online unit delivery were addressed Strategies to improve communication about online learning activities were deployed	Course and unit design is evaluated annually as part of the UTAS quality assurance framework, and approved changes implemented in the next delivery.

Recommendations

Recommendations from the project team regarding the design and delivery of the Masterclass in Horticultural Business, or similar future offering include:

- There is demand for university level qualifications to cater to the specific learning needs of industry professionals in horticulture.
- Flexible delivery is critical to student success so students can manage work and family commitments and align study with peak production periods. This includes flexibility around assignment due dates, offering twice-yearly course intakes, with the option for part-time enrolment.
- Scholarships ease the financial burden of participants attending face to face activities and can target specific industry sectors.
- Offer the qualification as a Graduate Diploma. This caters to a diverse cohort of participants, who include graduates with a bachelor's degree through to industry professionals with five years or more of experience.
- Networking opportunities between participants and industry experts are highly valued and impactful.
- Conduct student surveys both during the course and after graduation, to evaluate the impact of the program.
- High-quality online teaching resources take time, and technical/disciplinary expertise to develop, but are critical to success.
- The Masterclass model can be successfully extended to other agricultural industries, thus upskilling the business skills of professionals working in these sectors.

Refereed scientific publications

Journal article

Acuna, T., Monckton, D., Boersma, M., Bailey, A., Gracie, A. J., 2019. Design and Delivery of a Masterclass in Horticultural Business. *International Journal of Innovation in Science and Mathematics Education*, 27(4), 88-96.

Papers in a conference proceeding

Acuna, T., Gracie, A. J., Knowles, C., Monckton, D., Close, D., Boersma, M., 2018, September 2018. Curriculum design to build capacity of industry professionals: a Masterclass in Horticulture. Paper presented at the Proceedings of the Agricultural Education Symposium, Adelaide.

Gracie, A. J., Acuna, T., Knowles, C., Monckton, D., Close, D., Boersma, M., 2018. Curriculum design to build capacity of industry professionals: a Masterclass in Horticulture. Paper presented at the Proceedings of the Australian Conference on Science and Mathematics Education, 26-28 September, Adelaide.

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Intellectual property

This program created new IP through the development of the Diploma of Horticulture Business and Graduate Diploma of Agribusiness in Horticulture Business. While the content has been developed in partnership with Wageningen Academy, Lincoln University and Hort Innovation, royalty free license was granted to the University of Tasmania to use the material. Full IP rights are to be transferred to the University of Tasmania after the five-year co-investment period.

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- Hort Innovation
- Tasmanian Institute of Agriculture
- University of Tasmania
- Lincoln University
- Wageningen Academy
- Consultants
- Business Owners that hosted on site visits
- The Steering Committee
- Guest speakers

Appendices

Appendix 1. Participant information sheet for Phases 1 and 2

PARTICIPANT INFORMATION SHEET

SOCIAL SCIENCE/ HUMANITIES RESEARCH

Masterclass in Horticulture Business

Invitation

You are invited to participate in a research study that aims to develop and deliver a Diploma in Horticulture Business at the University of Tasmania. The study is being conducted by:

The University of Tasmania: Dr Alistair Gracie, Dr Tina Acuna

1. What is the purpose of the study?

The purpose of the study is to develop a Masterclass in Horticultural Business, by: 1) Developing a Diploma in Horticulture Business; 2) Implement continuous review and monitoring of the course and units to improve student learning outcomes.

2. Why have I been invited to participate in the study?

You have been invited to participate in this study because of your capacity to offer insights into the process of developing and monitoring a Masterclass in Horticultural Business at the University of Tasmania.

3. What does the study involve?

Building human resource capacity and leadership in production horticulture is of fundamental importance to the ongoing success and growth of the industry in Australia. Data and trends depict the horticultural workforce as having a lower proportion undertaking formal training and education when compared with the broader agricultural sector. Pre-tertiary training can provide a strong understanding of the horticultural systems, together with critical and analytical thinking that promotes the development of leadership capacity. The targeting of coordinated training across horticulture is essential to develop future leaders, as is provision of opportunities for continual up-skilling through modular delivery of professional development training.

The objective of the proposed program is to develop and deliver a Global Master Class in horticulture that gains a premium reputation nationally and internationally within 5 years. This will involve working closely with Horticulture Innovation and Wageningen Academy to shape the course structure, content, and mode of delivery to best meet domestic industry needs. The University of Tasmania has close connections with Lincoln University and will collaboratively co-deliver the course, with a view to successfully establishing the Global Master Class beyond the 5-year period of the program.

4. What will I have to do?

We would like you to participate in a focus group discussion, an interview or a short survey that will take between 10 minutes (survey) to 45 minutes (interview and focus group discussion) and handing in or submitting your written comments.

It is important to understand that your participation in the workshop does not depend on you agreeing to provide your comments at the conclusion of the workshop and that you may withdraw your permission to have those materials used at any time without any effect, and if you so wish, may request that any identifiable data you have supplied to date be withdrawn from the research.

Participants will be non-identifiable if they choose not to record their name and contact details on the focus group discussion materials they hand in at the conclusion of the session. Participants will have the option of including their contact details (and therefore be identifiable) on the materials if they are willing to be contacted with follow-up questions to clarify the data for the project collected at the workshop.

The researchers will be unable to link consent forms with workshop materials unless a name is provided on the focus group materials that are handed in. Participants will only be able to withdraw data after the workshops if they have provided their name on the materials that are handed in. Participants in surveys will be non-identifiable.

All information will be treated in a confidential manner, and your name will not be used in any publication arising out of the research. All of the research will be kept in a locked cabinet in the Chief Investigator's office at the University of Tasmania. The data will be destroyed via secure disposal five years after the last publication from the research

5. Are there any possible benefits from participating in this study?

The intended outcomes of this study are to: 1) build human resource capacity in horticultural business; 2) provide a pre-tertiary qualification that combines a strong understanding of horticulture production and business practices; 3) demonstrate to what extent the project achieved its intended outcomes for participating staff and students; 4) document what lessons have been learned that might be of assistance to other institutions.

6. Are there any possible risks from participating in this study?

There are no specific risks anticipated with participation in this study.

7. What if I have questions about this research?

If you would like to discuss any aspect of this study, please feel free to contact the Project Leader, Dr Alistair Gracie at Alistair.Gracie@utas.edu.au or Phone 6226 7468. He will be happy to discuss any aspect of the research with you. You are welcome to contact him at that time to discuss any issue relating to the research study. Participants will be able to obtain a summary of the results of the research by contacting Alistair Gracie during or after the completion of the project (in 2020).

This study has been approved by the Tasmanian Social Science Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study should contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. You will need to quote [*HREC 16252*].

Thank you for taking the time to consider this study.

If you wish to take part in it, please sign the attached consent form.

This information sheet is for you to keep.

Appendix 2. Survey instrument for Phase 1

Forum or interviews on course development

Location:

Forum leader(s):

The purpose of this forum or interview is for you to contribute your insights to the development of a Masterclass in Horticulture Business at the University of Tasmania.

Questions for discussion:

1. Which stakeholder group do you represent?
2. What are the potential benefits to your organisation from participating in the project?
3. What impact do you think the project will have on the horticulture sector?
4. Please describe your role in course design.
5. [Provide the course description.] Does the course description describe what you would expect students to know, understand and do on completion of the Diploma in Horticulture Business?
6. [Provide the course structure.] How appropriate is the course structure and delivery mode?
7. What reference points were used to inform the course design?
8. Are the learning outcomes and assessment appropriate to meet the intended course learning outcomes?
9. Is the content up-to-date and relevant to the discipline?
10. [Provide the entry criteria.] How appropriate are the entry criteria and selection process?
11. Do you have any comments on the future sustainability of the course?
12. What factors helped and hindered in the achievement of the project outcomes to date?
13. What lessons have been learned from this project and how might these be of assistance to other institutions?
14. Do you have any other comments?

Consent form for focus group discussions/interviews

Title of Project: Masterclass in Horticultural Business

This project has been approved as a Minimal Risk project by the Social Science HREC of the University of Tasmania

1. I have read and understood the 'Information Sheet' for this project.
2. The nature and possible outcomes of participating in the focus group discussion or interview have been explained to me.
3. I understand that the study involves participating in a focus group discussion or interview and handing in my comments at the conclusion.
4. I understand that participation involves minimal risk.
5. I understand that all research data will be securely stored on the premises of the focus group leader's home university (University of Tasmania) for at least five years and will be destroyed when no longer required.
6. Any questions that I have asked have been answered to my satisfaction.
7. I agree that research data gathered from me for the study may be published if I cannot be identified as a participant.
8. I understand that the researchers will maintain my identity as confidential and that, if I choose, I may choose not to provide my name and contact details. Also, that any information I supply to the researcher(s) will be used only for the purposes of the research.
9. I understand that my participating in the focus group or interview does not depend on my agreeing to provide my comments at the conclusion of the workshop and that I may withdraw my permission to have those materials used at any time without any effect, and if I so wish, may request that any data I have supplied to date be withdrawn from the research. (Data will only be able to be withdrawn if a participant has recorded their name on the material handed in.)

Name of Participant:

Signature:

Date:

Appendix 3. Survey instruments for Phase 2

Consent form for student surveys

Title of Project: Masterclass in Horticultural Business

This project has been approved as a Minimal Risk project by the Social Science HREC of the University of Tasmania

1. I have read and understood the 'Information Sheet' for this project.
2. The nature and possible outcomes of participating in the surveys have been explained to me.
3. I understand that the study involves participating in an entry survey, a survey on each subject, and an exit survey and handing in my comments at the conclusion.
4. I understand that participation involves minimal risk.
5. I understand that all research data will be securely stored on the premises of the project leader's home university (University of Tasmania) for at least five years and will be destroyed when no longer required.
6. Any questions that I have asked have been answered to my satisfaction.
7. I agree that research data gathered from me for the study may be published if I cannot be identified as a participant.
8. I understand that the researchers will maintain my identity as confidential and that, if I choose, I may choose not to provide my name and contact details. Also, that any information I supply to the researcher(s) will be used only for the purposes of the research.
9. I understand that my participating in the surveys does not depend on my agreeing to provide my comments at the conclusion of the survey and that I may withdraw my permission to have those materials used at any time without any effect, and if I so wish, may request that any data I have supplied to date be withdrawn from the research. (Data will only be able to be withdrawn if a participant has recorded their name on the material handed in.)

Name of Participant:

Signature:

Date:

Entry survey for new students

1. What is your business postcode?
2. What is your age bracket: (18-25, 25-35, 35-45, 45-55, 55+)
3. What is your highest level of qualification: (High school certificate, Certificate (I, II, III, IV), Diploma, Advanced Diploma, Bachelor Degree, Bachelor Honours Degree, Masters Degree, Doctoral Degree)
4. How did you first hear about the Masterclass in Horticulture Business (Diploma in Horticulture Business)?
 - a. Industry website
 - b. UTAS website
 - c. Magazine or newspaper article
 - d. Family or friends
 - e. Other
5. Which horticultural sector do you identify with? Tick all that apply:
 - a. Annual horticulture
 - i. Specify main crops produced:
 - b. Perennial horticulture
 - i. Specify main crops produced:
 - c. Owner or part-owner of a horticultural business
 - d. Senior manager of a horticultural business
 - e. Horticultural consultant
 - f. Logistics and supply chain management
 - g. Processing and marketing
 - h. Supplier of inputs for horticultural production
 - i. Other:
6. What size is your business (FTE of permanent staff)? (1 – 15 people; 16 – 50; 51 – 250; 251 – 500; 500+)
7. What is your peak number of casual employees, annually? (1 – 15 people; 16 – 50; 51 – 250; 251 – 500; 500+)
8. What are your personal goals from participating in this course?
9. Do you have any comments on the structure or content of the course?
10. The course is delivered through a combination of compulsory face-to-face activities and is supported by distance learning.
 - a. Do you have access to a computer with reliable internet?
 - b. How would you rate your competency in using a personal computer (poor, average, good, very good)
11. Students will need to use word processing software to complete some activities in this course. Please rate your competency in using the following software:
 - a. MS Word (poor, average, good, very good)
 - b. MS Excel (poor, average, good, very good)
 - c. MS PowerPoint (poor, average, good, very good)
12. Do you have any feedback on the admission and enrolment procedure into the Diploma?
13. Are you studying full or part-time?
 - a. If part-time, how many years do you aim to complete the course in?
14. Do you have any plans at this stage to articulate into the Associate Degree in Agribusiness?

Survey for enrolled students (mid- and end of term)

1. Subject name, term and year
2. How much time do you allocate to review of the subject content and assignment preparation per week? (0 hrs, 1 – 3 hrs, 4-10 hrs)
3. Is the time you need for study in this subject manageable alongside your other work commitments? (very difficult, difficult, mostly ok, good)
4. Can you reliably access the online subject materials and learning activities? (rarely, sometimes, most of the time, all of the time)
5. Is the subject content relevant and up to date? (not relevant, mostly relevant, relevant, very relevant).
Comments:
6. Are your teachers approachable? (rarely, sometimes, most of the time, all of the time), comments.
7. Is feedback provided to you in a timely manner? (rarely, sometimes, most of the time, all of the time), comments.
8. Do you read and act on the feedback provided to you by your teachers? (rarely, sometimes, most of the time, all of the time), comments.
9. Do the activities help you to engage with and learn the subject material or skills? (rarely, sometimes, most of the time, all of the time), comments.
10. List three topics or activities in this subject that you found the most interesting and/or relevant, and why.
11. List three topics or activities in this subject that you found less interesting and/or relevant, and why.

Exit survey of students on completion of the course

1. Did you meet your personal goals on completion of the course?
2. Have you or do you plan to implement any changes to your horticultural business because of completing the course?
3. Were there any gaps in course content?
4. Did the course/subject timetable fit with your business cycle or commitments?
5. List two subjects or activities that you found the most interesting and/or relevant, and why.
6. List two subjects or activities that you found less interesting and/or relevant, and why.
7. Would you recommend the course to your family, friends and/or business associates?
8. Do you plan to articulate into the Associate Degree in Agribusiness?

Appendix 4. Longitudinal survey of graduates

Preamble to survey:

The Masterclass (Diploma) in Horticultural Business was developed in collaboration between UTAS, Lincoln and Horticulture Innovation Australia, and first offered in 2017.

The Diploma aims to equip horticultural professionals with a strong understanding of horticultural systems, together with critical and analytical thinking required to promote and lead the sector.

You have been invited to participate in this study because you are a previous graduate of the Diploma of Horticultural Business.

The purpose of this study is to gather longitudinal data on the impact of the Diploma on graduate employability and the horticultural sector, more generally.

Part A includes seven demographic questions. Part B includes five questions, which seeks feedback on the course. Part C is a request to contact you again in 2 years.

Participants will be non-identifiable if they choose not to record their name and contact details in the survey they submit. Participants will have the option of including their contact details (and therefore be identifiable) if they are willing to be contacted with follow-up questions to clarify the data for the project.

This survey is approved by the Human Research and Ethics Committee at the University of Tasmania (HREC16252). If you have any questions about the survey, please contact the project lead Dr Mark Boersma (Mark.Boersma@utas.edu.au or 03 64304928).

Click next to start the survey.

Part A Demographic information

1. Which year did you complete the Diploma of Horticultural Business?
 - a. Text box
2. What is your business postcode? [comment]
3. What is your age bracket: (18-24, 25-34, 35-44, 45-54, 55+)
4. What is your highest level of qualification: (High school certificate, Certificate (I, II, III, IV), Diploma, Advanced Diploma, Bachelor's degree, Honours Degree, Master's Degree, Doctorate)
5. Which horticultural sector do you presently work within? Tick all that apply:
 - a. Annual horticulture
 - i. Specify main crops produced: [comment]
 - b. Perennial horticulture
 - i. Specify main crops produced: [comment]
 - c. Owner or part-owner of a horticultural business
 - d. Senior manager of a horticultural business
 - e. Horticultural consultant
 - f. Logistics and supply chain management
 - g. Processing and marketing
 - h. Supplier of inputs for horticultural production
 - i. Other (please specify).
6. What size is your business (FTE of permanent staff)? (1 – 15 people; 16 – 50; 51 – 250; 251 – 500; 500+)
7. What is your peak number of casual employees, annually? (1 – 15 people; 16 – 50; 51 – 250; 251 – 500; 500+)

Part B Questions

8. Have you changed your role within the business or employment since completing the Diploma?

- a. No
 - b. Yes - comment
- 9. Did you implement all or some of the business plan that you developed as a capstone project in the Diploma?
 - a. Yes
 - i. All
 - ii. Some
 - iii. When, what and how did you implement it? [comment]
 - iv. What impact did your plan have on the business? [comment]
 - b. No
 - i. Please comment why not?
- 10. To what extent were the following units covered in the Diploma useful to you since graduation? Please rate each unit on a scale of 1-100.
 - a. Horticultural Management
 - b. People and Culture
 - c. Value Chain Management and Logistics
 - d. Financial Management and Law
 - e. Horticultural Marketing and Communication
 - f. Global Trends and Internationalisation
 - g. Innovation and Entrepreneurship
 - h. Business Development and Strategy
 - i. Comments
- 11. What skills and knowledge have you used in your work that you attribute to completing the Diploma?
 - a. Comments
- 12. Do you have any other comments?

Part C – future contact

- 13. Can we please contact you in 2 years, with a similar survey? This will enable us to collect data on the longer-term impact of the Diploma.
 - a. If yes, please disclose your name and contact details.

Appendix 5. Typical face-to-face workshops itineraries

Face-to-face Workshop 1, Victoria

Date and time	Activity
Day 1 Friday, 17 February 2017	
10am	Arrival - tea and coffee
10.30 am	Introductions Course structure and objectives University resources Mode of delivery Course outcomes and expectations Self-Directed Learning - How to use the tools Interacting with teaching staff and each other
12.30 pm	Lunch
1.30 pm	Horticultural Business Site Visits – See (Day 1) Field Tour Schedule Fresh Leaf Australian Herbs (Fresh Herbs) Sunny Ridge (Strawberries) Paringa Estate (Vineyard)
6:30pm	Dinner at Paringa Estate
Day 2 Saturday, 18 February 2017	
9:00 am	Financial Management Excel workshops (bring own laptops)
10.30 am	Morning Tea
11.00 am	Financial Management
12:30 pm	Lunch
1:30 pm	Afternoon session Module 1: Assessment Tasks P&P (Practice and Portfolio) Survey: What you hope to achieve from the course Q & A Session (including “trouble-shooting”)
4:00 pm	Close

Day 1 Field Tour Schedule, Victoria

Time	Activity	Travel details	Location
1.30 pm	Leave Quest Frankston on the Bay	25 mins to Fresh Leaf Herbs	30 Clyde-Five Ways Rd, Clyde VIC 3978
2:00 pm	Tour Fresh Leaf	60 mins	
3:00 pm	Depart Fresh Leaf	42 min to Sunny Ridge Strawberry Farm	244 Shands Rd, Main Ridge VIC 3928
3:45 pm	Tour Sunny Ridge	60 mins	
4:45 pm	Depart Sunny Ridge	10 mins to Paringa Estate	44 Paringa Road, Red Hill South VIC 3937
5 pm	Tour Paringa Estate	60 mins	
6:30 pm	Dinner @ Paringa Estate		
9:00pm	Depart Paringa Estate	37 mins to Quest Frankston	435-437 Nepean Hwy, Frankston VIC 3199
9:40 pm	Arrive Quest Frankston		

Total Road Time = 1:54 min; Total Distance = 114 km

Day 1 Field Tour Schedule, Queensland

Time	Activity	Travel details	Destination
7am to 9am	Tour Markets	2 hours	Rocklea Brisbane Markets
9am -9.30am	Breakfast at Markets	30 min	
9.45am	Bus to Kalfresh	56 min (75.3 km)	Address: Kalfresh Pty. Ltd., 6202 Cunningham Hwy, Kalbar QLD 4309
10.45am	Tour Kalfresh	90 min	
12.15pm	Depart Kalfresh	66 min (89.4km)	Kalfresh to Gatton: lunch break (either packed or in Gatton)
1.30pm	Break for lunch	30 min	3km from Kalfresh is Arichula which has bakeries etc...
2.00pm	Depart Gatton	9 min (9.6km)	Grantham: Grantham Orchards
2.15pm	Tour Grantham Orchards	75 min	
3.30pm	Depart Grantham	19 min (22 km)	
4.00pm	Tour Lockyer Valley Organics (previously Bauer's Farm)	90 min	48 Left Hand Branch Rd Mount Sylvia, QLD 4343
5.30pm	Depart LVO	17 min (20.5km)	Room Motels Gatton
5.50pm	Arrive Room Motels Gatton		Address: 1 Hawck St, Gatton 4343
6.30- 9:00pm	Dinner @ Lockyer Valley Cultural Centre Function Rooms	(Pre-book meals)	Speaker: Trent DePaoli

Day 2 Field Tour Schedule, Queensland

Time	Activity	Time	Topics
8.00am	Breakfast	60min	(Organise own breakfast at café or motel)
9.00am	Session 1	90 min	Where we are headed: Own Business Plan and presentation at third face-to-face. Key learning points from modules in relation to business plan ZAH101 ZAH102 David ZAH103 ZAH 104 Alison Discussion time
10.30am	Morning tea	30 min	
11.00am	Session 2	90 min	Upcoming modules and assignments in relation to own business plan Discussion time
12.30pm	Lunch	30 min	
1.00pm	Session 3	90 min	Presentation Techniques Interactive: Draft and present a Generic Business Plan in groups Discussion time
2.30pm	Afternoon tea and Question time	30 min	
3.00pm	Close		
3.15pm	Car-pool to Brisbane Airport	Allow 2 hrs before flights	Several people have cars and are happy to offer lifts

Face-to-face Workshop 3, Tasmania

Time	Activity	Lecture Theatre 1	Lecture Theatre 2
8.45am	Gather near Harvard Lecture Theatres	Stream 1 (9 Business Plan Presentations)	Stream 2 (9 Business Plan Presentations)
9.00 am	Presentations	Student 1	Student 2
9.25am	Presentations	Student 3	Student 4
9.50am	Presentations	Student 5	Student 6
10.15am	Presentations	Student 7	Student 8
10.40am	Presentations	Student 9	Student 10
11.05am	Morning Tea Break (Geography Tea Room) (Olive Tree Catering)		
11.35am	Presentations	Student 11	Student 12
12.00pm	Presentations	Student 13	Student 14
12.25pm	Presentations	Student 15	Student 16
12.50pm	Presentations	Student 17	Student 18
1.15pm	Harvard Room 2	Summary and updates	
1.30pm	Lunch Break @ TSBE function room Level 4 (Olive Tree Catering) Participant feedback and survey		
2.30pm	Break		
5.00pm	Pre-dinner drinks at UTAS Staff Club		
6.00-7.30pm	Celebratory Dinner at UTAS Staff Club (Pickled Pear Catering) *Special dietary requirements will be catered for separately upon request		

Day 2 Field Tour Schedule, Tasmania

Time	Activity	Time	To:
8.15am	Pickup from hotels: Wrest Point, UTAS life sciences car park, Woolstore	Allow 30min	The Royal Tasmanian Botanical Gardens
8.45am	Meet and Greet at Main Gardens Entrance	15min	
9.00am	Behind the Scenes Tour of Botanical Gardens	90min	
10.30am	Government House, Welcome, tea/coffee, discussion	60min	Government House (Walk through from Royal Tasmanian Botanical Gardens)
11.30am	Tour Government House, State Rooms and Gardens	60min	
12.30pm	Lunch at Government House (sandwiches/stand)	30min	
1.00pm	Bus	17min, 19.4km	Westland Nurseries, 118 Surf Rd, Seven Mile Beach, TAS 7170
1.20pm	Tour Westland Nurseries	1h 40min	
3.00pm	Bus	29min, 26.5km via Tasman Hwy	Bejo Tasmania, 323 Prossers Rd, Richmond TAS 7025
3.30pm	Tour Bejo Seeds	90min	
5.00pm	Bus	9min, 5.3km via Prossers Rd	Richmond Historical Precinct, TAS 7025
5.10pm	Break in Richmond historical precinct	30min	
5.40pm	Bus	3min (1.4km)	Pooley Wines, 1431 Richmond Rd, Richmond, TAS 7025
5.45pm	Pooley Wines Soil & Vines tour	60min	
6.45pm	Wood fired Pizza at Pooleys	75min	
8:30 pm	Return to Sandy Bay, UTAS	27min, 27.4km via Tasman Hwy	Stop off at hotels on return

Appendix 6. Student case studies

Sonja Cameron– 2018 Graduate

The University of Tasmania's Graduate Diploma in Agribusiness: Masterclass in Horticultural Business offers participants immersive study that will ultimately make them a better businessperson.

The Masterclass in Horticultural Business equips current and future farm managers, owners and employers with the agribusiness skills and capabilities required to run profitable and sustainable farm businesses.

Offered through the Tasmanian Institute of Agriculture (TIA) and developed in partnership with some of the world's leading names in horticulture, including New Zealand's Lincoln University, the Wageningen Research Academy in the Netherlands, and Hort Innovation, the course is delivered online, with face-to-face learning and networking opportunities.

NSW businesswoman, Sonja Cameron took the Masterclass in 2017. And, as a member of the Masterclass's steering committee, Sonja is more than happy to champion the diploma that has been embraced by industry participants.

Sonja and her husband Andy have overseen Cameron's Nursery, in Arcadia, in NSW's Hills District region since they "boot strapped" the fledgling business with a \$4000 investment in 1992.

But it was a damaging hailstorm in mid-October 2020, that saw Sonja summon management skills gleaned from the Masterclass that could have otherwise seen the business collapse.

"We had 12 hours to decide what our plan of attack was going to be and how we were going to save the 30 staff we had," Sonja said. We had to be strong leaders to decide what are we doing, what is our plan of action and how are we getting out of this."

Sonja's strategy saw her marshal her staff into teams and prioritise what could be saved.

"We had the nursery back up and running within three weeks and selling plants again because we had a plan.

"It's tough to get up the next day and see your entire livelihood shredded, but it is what it is, and you can't change it. I always say to my staff you need tools in your toolbelt, and you need a bit of resilience.

"And it all goes back to the Masterclass idea of having a plan. Whether that is a business plan, or a plan overall, or a plan for that moment, or a plan for an employee, it's all the same."

The course is designed for people who are working in the horticultural industry to increase their agribusiness skills and gain a formal qualification.

The Horticulture Masterclass has helped professionals from across the country turn their business ideas into actionable business plans, so that they're ready to overcome challenges and reach their full potential as one of the many success stories of the Australian horticulture industry.

"Ultimately what came out of that year is a brilliant business plan," Sonja said.

The nursery is soon to take delivery of a \$300,000 potting machine – an outcome of the business plan devised in the Masterclass, that was funded through a bank loan that also owed much to her newly developed business planning skills.

"I presented my bank manager with a 31-page document as to why we should buy this potting machine and why they should give me the money for the infrastructure to go around it. Because if you go to the bank and ask for half a million dollars, you will need to give solid financials and the reason why you want the money."

The Masterclass presents an opportunity to formalise qualifications and encourages business owners and managers to work on the business, not only in the business.

“Because of all the background work we had to do, what popped out at the end was a really meaningful paper which we have stuck to, and we are now in the last 6 months of,” Sonja said.

“We have a plan and we have been able to strategically place things that needed to happen to get us to where we are today because of that business plan.”

Wayne Trengrove – 2019 Graduate

With more than 20 years’ experience working at two of the country’s biggest orchards, there is not much Wayne Trengrove, of Hansen Orchards, does not know about growing high-quality fruit in Tasmania.

Wayne manages 100 hectares of cherries and 40 hectares of apples at two sites on Hansen Orchards’ Rosegarland property, in Tasmania’s south. Before joining Hansen, he lent his expertise to Reid Fruits - one of Australia’s largest cherry producers and international exporters of premium fruit.

But a seed of an idea to extend his knowledge was planted when interstate friends spoke highly of study that they had completed the year earlier.

His friends had completed the Masterclass in Horticultural Business through the Tasmanian Institute of Agriculture in 2016.

“They have a plant nursery in Queensland, and they said it was a fantastic class,” Wayne said.

“They had gone through the numbers with cost and reward and found some of the decisions they made on ‘gut feeling’ were not smart moves. And as farmers we tend to make a lot of decisions on ‘gut feeling’.”

Wayne explained that the Horticulture Masterclass introduced him to Sensitivity Analysis, which is key to business management, financial forecasting and predicting the future outcomes of business.

“I applied all aspects of what we learnt in my role,” Wayne explained. “Where the bottom line would come from if we adjusted certain costs; how day-to-day managing people, purchasing items, and understanding decisions we make - that we assume are viable but may not be as viable as we think they are.

“The Masterclass helped me to become a more efficient manager.”

As an ageing, but experienced workforce is being replaced by younger employees, Wayne found the focus on diversity and managing change particularly useful.

“The workforce is becoming so diverse you need to know how to manage an array of individuals,” Wayne said. “And I wanted to make the workplace as good as I can to attract the next generation of exciting individuals.

“I have two of the youngest guys in the industry – they are the best at their age in Tasmania and I have two of these guys working for me.

“One has come across to horticulture from another industry, while the other is straight out of school. Learning how you manage this cohort compared to older generations really intrigues me.”

From the workshops to the lectures, Wayne spoke highly of his experience, noting he felt encouraged from everyone involved in the delivery of the masterclass.

“The lecturers and associate professors were outstanding,” Wayne said.

“From the lecturers to everyone putting the classes together - you could just see they wanted everyone to succeed.”

And, like his Queensland nursery friends did for him, Wayne said he would happily recommend the course to others, so

much so, he is considering going back to school.

“I would say do it. It was totally worthwhile,” he said.

“In fact, I have thought ‘should I do it again?’”

Kirsty Dickenson - 2021 Graduate

As Kirsty Dickenson reflects on her recent studies, it becomes soon apparent her decision to undertake a Masterclass in Horticultural Business in 2020 was a good one.

Offered through the Tasmanian Institute of Agriculture (TIA) and developed in partnership with some of the world’s leading names in horticulture, including New Zealand’s Lincoln University, the Wageningen Research Academy in the Netherlands, and Hort Innovation, the course equips current and future farm managers, owners and employers with the agribusiness skills and capabilities required to run profitable and sustainable farm businesses.

A horticulturalist with Costa, Kirsty works in the berry category with a focus on raspberries and an avocado trial in Tasmania’s north-west.

And it’s a role that is so broad and diverse, that the Bachelor of Agriculture graduate said she would find it hard to define an average day.

“I’m involved in everything from making decisions around planting and crop manipulations, identifying pest and disease concerns, and creating and assessing Integrated Pest Management (IPM) strategies, canopy management and all things crop management from pre-planting to ensuring the best fruit possible for our harvest team,” Kirsty explained.

“I’m actively involved in our research activities and have begun to move into some of the new development of planning and capital expenditure proposals associated with them.”

With so much of Costa business in her remit, Kirsty recognised the Masterclass in Horticultural Business could be a wise next step in her career development.

“I wanted to expand my skillset and be ready to be involved in business management in my future,” Kirsty said. “And to increase my understanding of the many elements of running a business, particularly to be more aware of the business I work in, the context it operates in and what it takes to be a successful business.”

Kirsty said the Masterclass helped her understand risk and decision making; the process of identifying where Costa fits in the market; identifying new opportunities and attaining skills in understanding the feasibility of potential opportunities; as well as building the skills required to create a business plan - for either a new business or a new opportunity within an existing business.

She also discovered surprising characteristics of her own.

“Learning about my attitude to risk was interesting and eye opening,” Kirsty said.

“As a traveller and someone who enjoys getting out of my comfort zone and learning new things, I intrinsically thought I would have a higher tolerance for risk, however the resources offered within the class indicated I am risk averse.

“I was surprised at first. However, when I really thought about it, it made sense.

“Understanding my attitude to risk and being able to identify the level of risk of other decision makers in the business I work in, allows me to make conscious decisions that are suitable for the business and may be slightly riskier than what perhaps I may have been comfortable with in the past.”

With the Masterclass’s blend of innovation, skill building, fun, and flexibility, Kirsty said she learned a lot and believes her

studies have helped her grow in her current role and will assist her as she moves forward in her career.

“I enjoyed undertaking the Masterclass and the flexibility of the course,” Kirsty said.

“Although there is a set structure the facilitators are really understanding of the nature of balancing study with busy work periods. I was able to work at my own pace, which really helped me to keep a balanced life.”

Camila Campos – 2021 Graduate

The business plan Camila Campos developed through The University of Tasmania’s Graduate Diploma in Agribusiness: Masterclass in Horticultural Business, has resulted in the creation of a localised solution to a global problem when it comes to food waste.

Offered through the Tasmanian Institute of Agriculture (TIA) and developed in partnership with some of the world’s leading names in horticulture, including New Zealand’s Lincoln University, the Wageningen Research Academy in the Netherlands, and Hort Innovation, the course equips current and future farm managers, owners and employers with the agribusiness skills and capabilities required to run profitable and sustainable farm businesses.

Camila is a market development representative for Seminis, a vegetable seed business owned by Bayer. She is based in Toowoomba. She moved to Australia from Argentina where she studied Agricultural Engineering.

With a desire to build on her studies and extend her knowledge in horticulture, Camila began to research courses before landing on the Masterclass in Horticultural Business.

“The option of online and flexible learning appealed to me - you can do it while having a full-time job” Camila said.

Camila began her studies in July 2020 and delivered her business plan in September 2021.

Two initial ideas were discarded before she landed on a plan that was partly inspired by the covid-19 pandemic: Imperfood - a business selling imperfect fruit and vegetable boxes in south-east Queensland.

She recognised there was a rise in online shopping and new demand for home delivery, plus the border restrictions shrunk the labour market.

“With Imperfood we want to help local growers as much as possible buying their second-grade produce, giving them the opportunity of selling produce that otherwise would go to waste. And, at the same time, help to reduce food waste and give consumers convenient access to sustainable, affordable, and healthy food.

“An essential part of the business is the media, through social media we want to share crop information, food waste facts, growers’ stories, explain some of the causes of the vegetables’ defects, and try to bring the customer closer to the grower.”

While the home-delivered produce box is not a new one, Camila identified two key points of difference that would apply to Imperfood: range and reach.

The south-east Queensland farms she regularly visits through her role with Seminis grow the most diverse range of commercial fruit and vegetables of any area in Australia and is rated among the top-ten most fertile farming areas in the world.

“From the Granite Belt to Brisbane, there are crops the whole year round, from apples, strawberries, tomatoes, capsicums, beans, sweet corn, onions, brassicas and so much more,” Camila said.

The brand was conceived by emphasising the concept that people, like plants and animals, are imperfect by nature, unique.

“We took the concept and transferred it to the world of horticulture to give value to the vegetables and fruits that are generally thrown away for having ‘cosmetic’ imperfections.”

Camila said her business plan presentation itself inspired more ideas for Imperfood, with a suggestion to incorporate growers' vehicles into the business model delivery logistics.

"Networking for me was probably the most important part of the Masterclass," Camila said.

"In my case, it pushed me to create the business plan. I don't have a family business and I didn't really have an idea. I wanted to finish it and do it, but in the end, it worked out well. You never know when an idea can be a good one.

"I am not a business-focused person, but I am driven to create changes in customer perception to try to help growers and make an impact."

Zhensong (Song) Zhu – 2021 Current student

Agronomist Zhensong (Song) Zhu is only mid-way through his studies for the Masterclass in Horticultural Business but can already see the benefits it will provide both him and his employer.

The University of Tasmania's Graduate Diploma in Agribusiness: Masterclass in Horticultural Business offers participants immersive study that will ultimately make them a better businessperson.

Offered through the Tasmanian Institute of Agriculture (TIA) and developed in partnership with some of the world's leading names in horticulture, including New Zealand's Lincoln University, the Wageningen Research Academy in the Netherlands, and Hort Innovation, the course is delivered online, with face-to-face learning and networking opportunities.

Song has recently joined Impact Fertiliser and is based in the company's Melbourne office. Previously, he worked for Coolibah Herbs.

"Before I joined Impact Fertiliser I was regularly traveling across farms in Victoria, checking the crop quality and giving recommendations to farmers on soil health, fertiliser application and chemical use," Song said.

"Coolibah Herbs, as a leader in the vegetable industry, is focused on the organic market and minimising using chemicals in conventional crops.

"As one of the leadership team at Coolibah, I led the agronomy team for three years and ensured Coolibah products retained their position as a quality item in the market.

"The Masterclass will give me a better idea of the industry and I can read things from a different angle."

Song studied a bachelor's degree in Agricultural Science in China, from 2011-2015. After moving to Australia, he furthered his studies with a Master of Agriculture Economics at the University of Western Australia (2017-2019) and saw the Masterclass in Horticultural Business as an opportunity to further his studies and increase his network.

"As I have been away from school for a couple of years, I wanted to go back to Uni to refresh my knowledge and look at what is new in the industry," Song said.

"Although we are struggling in the covid situation, it is still lovely to meet people around the country and talk about their stories among the industry."

Song is keen to translate theory into practice and apply the learnings from the Masterclass that will benefit him, his employer, and the industry.

"As a starter in the industry, I gained practical experience and applied the knowledge I gained from university into the field, Song said.

"From my point of view, an agronomist helps people get access to high quality and safe crops. I can then develop a better understanding of what is the right way to approach farming."

Appendix 8. Journal article

Design and Delivery of a Masterclass in Horticultural Business

Tina Botwright Acuña^a, David Monckton^a, Mark Boersma^b, Alison Bailey^c and Alistair Gracie^a

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Keywords: vocational training, diploma, work-integrated learning, agribusiness

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Abstract

The Masterclass in Horticultural Business is a national program requested by and tailor-made for Australian business managers and entrepreneurs in horticulture. The University of Tasmania has developed the Masterclass in collaboration with the internationally recognised higher education providers Wageningen University and Research (Netherlands) and Lincoln University (New Zealand). The Masterclass builds on our strong links between teaching and research, development and extension in horticulture. The Masterclass, delivered as a new pre-tertiary qualification (Diploma in Horticultural Business) through the University of Tasmania, combines a strong understanding of horticulture production and business practices. The integrative program has a basis in production horticulture with modules including; people and culture, supply chain management, logistics, law, export, business planning and entrepreneurship. First offered in 2017, the program has attracted a range of industry professionals in horticulture. The design of the Masterclass for a national cohort of students necessitated online delivery that is highly-professional, flexible and relevant to people working in the horticultural industry to foster innovative and creative thinking and engagement among students. Module topics and assignments are designed to promote interaction of the participants with their staff (if they are business owners) or employers (if they work for a business owner). In this way the students are applying learnings to their workplace, raising questions and stimulating discussions about agribusiness. The high degree of industry engagement and endorsement as well as international collaboration in the design of the Masterclass is unique. The intention is that this Masterclass develops strong industry linkages and adds to the partners internationally recognised reputation in agricultural and business education. One of the major deliverables from the course is a student produced business plan, which must be delivered to industry and academic examiners. Many students have provided feedback indicating that they intend to put this business plan into action by applying it to new opportunities for their businesses.

Introduction

In 2016-17, the total value of agricultural commodities produced in Australia was \$61 billion, a 9% increase on 2015-16. Of this, horticulture was valued at \$11.2 billion, an 18% increase on 2015-16 (Australian Bureau of Statistics 2018). As a result, agriculture and specifically horticulture is one of the most important growth sectors within the economy (Xia 2018). The Australian Council of Deans of Agriculture (ACDA) and others have noted a skills shortage in agriculture, with annually about four jobs for every graduate (McSweeney & Rayner, 2011; Pratley & Botwright Acuña, 2015). The horticultural workforce has a lower proportion undertaking formal training and education when compared with the broader agricultural sector.

Building human resource capacity, business skills and leadership in production and processed horticulture is therefore of fundamental importance to the ongoing success and growth of this industry in Australia (Horticulture Innovation Australia 2015). Agriculture, and horticulture more specifically, are multidisciplinary. Knowledge and skills in agricultural economics and business management are acknowledged as essential for graduates if they are to provide the support necessary to maintain the competitiveness of Australian agriculture (Ag Institute Australia 2014). Furthermore, advances in the industry are underpinned by business skills and innovation, usually through the strategic and appropriate implementation of new practices (Argabright, McGuire, & King, 2012).

Building human capacity needs to focus on engaging the next generation of horticulturalists and providing opportunities for professional development of the current workforce. Informal professional development often takes the form of field days or other skills-based activities that have a basis in experiential learning, or learning by doing (Kolb, 1984) that is suited to adult learners and builds on their prior experiences. Often these learners lack formal training but have a wealth of life skills and experience, which they can bring to useful application in practically oriented learning programs. However, formal qualifications would assist them develop and expand their knowledge and capability. While there are formal qualifications available in horticulture including vocational training at Diploma and Bachelor level at some Australian universities, there remains a lack of formal training opportunities specifically for horticulture suited to professionals already working in the industry.

To address these issues, a Masterclass in Horticultural Business (hereafter referred to as the 'Masterclass') was tailor-made for Australian business managers and entrepreneurs in horticulture. Greater engagement between universities and industry in curriculum design and cooperation between providers have been advocated as essential components of curriculum rejuvenation (Bellotti, 2012; Dunne, 2010). Drawing on industry expertise to deliver content is typical in higher education in agriculture and other disciplines, and is an example of authentic teaching that is situated on campus (Oliver, 2010). Some examples in agriculture include dual sector degrees between TAFE and a university, or transnational education. Such international partnership arrangements are well-described in the literature (Gunn & Mintrom, 2013). There are however few examples of third-party delivery between the Australian tertiary institutions in agriculture.

Here, synergies were achieved that benefit the industry and students through combining the expertise in production horticulture (UTAS) with that of agribusiness (Lincoln) in an AQF5 Diploma in Horticultural Business. The framework for the Masterclass was based on Wageningen University and Research's Academy for farmer education and training, which was contextualised to the Australian horticultural industry. This required considerable modification due to the comparatively more complex horticultural system in Australia than is found in the Netherlands. The horticultural industry in Australia has a greater range in latitude, terrain and climate plus a combination of extensive and intensive production systems. As a result of this and the need to develop a tailor-made course for Australian circumstances, action research methods (Creswell, 2003), were used to: 1) examine the design and delivery of the Masterclass; 2) evaluate student feedback regarding their goals and their experience of undertaking the Masterclass; 3) determine whether the knowledge and skills they gained were applied in practice; and 4) reflect on the future delivery of the Masterclass and research opportunities.

Methods

The project was undertaken in two phases. Phase 1 focussed on the design and delivery of the Masterclass, where we examined the course philosophy, learning outcomes and modules. We sought feedback by interviewing six academics involved in the Masterclass project regarding the course design, structure and delivery.

In Phase 2, the Masterclass was delivered for the first time from February through to December, 2017 and the first student cohort ($n = 22$) was invited to participate in entry, mid and exit surveys. These surveys were designed to elicit their reasons for enrolling in the Masterclass and personal reflections on their achievements on completion of the course. Student demographic data, including age, region, educational attainment, size and scope of their horticultural business were also collected. Quantitative and qualitative data was collated, with each student allocated a numeric identifier e.g. 'S1' and analysed using mixed methods (Creswell 2003). The UTAS Human Research Ethics Committee approved this research (H16252).

Phase 1: Design and delivery of the Masterclass

The Course Learning Outcomes (CLOs) are provided in Table 1. These have a basis in experiential learning (Kolb, 1984), or learning by doing, which is regarded as a valuable means of ensuring integration of knowledge in agricultural education (Bauerle & Park, 2012; Knobloch, 2003; Roberts, 2006). Each of the eight modules (Table 2) examines a range of current issues in horticultural business that are relevant to business owners and upcoming young entrepreneurs. Module topics and assignments are designed to promote interaction of the participants with their staff (if they are business owners) or employers (if they work for a business owner). Each module was taught in parallel with a co-requisite work-integrated learning module (Practice and Portfolio or P&P) of equivalent credit. In this way, the students applied their learning to their workplace through work-integrated learning (Patrick et al. 2008), raising questions and stimulating discussions about agribusiness. Automatically assessed and graded quizzes with instant feedback provided at the end of each week of lectures test knowledge and application. Three on-line assignments per module test understanding of theory and application. Three face-to-face block sessions situated in different regional locations were followed by tours of farms and businesses that vary in structure and size. Each tour included talks by leading industry speakers and practitioners. The regular input from successful industry entrepreneurs in the form of case studies and farm visits was a deliberate intention of course designers. For example, one academic stated; *“We have put a lot of effort into getting the right people from industry... to help frame the subject content and to deliver some of the material”*. External feedback by an industry-based steering committee on the learning outcomes, content and sequence of the modules was sought during the design process, to ensure it was contemporary and addressed current issues in the horticulture industry.

The design of the Masterclass for a national cohort of participants necessitated online delivery that was highly professional, flexible and relevant to people working in the horticultural industry to foster innovative and creative thinking, and engagement among students. Content consisted of short video clips, interspersed with links to activities and resources. The use of digital technology in learning and teaching, consistent with contemporary norms in society, is one approach that caters to students who prefer or need to have ready access to information rather than through lectures (Prensky, 2001).

In designing the content, an academic stated that they were *“conscious that most people [are] doing this study on top of an existing workload so the [flexible delivery] is really important.”* The academics had relatively little prior experience in designing content for online delivery and stated; *“what we are delivering in this course is completely different to the content we are delivering [now]... which is basically face to face.”* Capacity building and professional development of the course design team in alternative delivery modes and techniques by engaging with educational technologists were instrumental in producing a quality online experience for students.

Table 1: Course Learning Outcomes (CLOs) for the Diploma in Horticulture Business

On completion of the Masterclass in Horticultural Business participants will be able to:	
1	Identify, analyse and reflect on personal and/or business goals and pathways for career/business development
2	Communicate contemporary knowledge of the principles of horticultural business
3	Apply business and entrepreneurial skills based on relevant theory within contemporary horticultural enterprises
4	Identify and articulate adaptable skills in the context of a dynamic horticultural business operating environment
5	Model the principles of sustainable horticultural business practice through ethical and professional conduct within a collaborative framework
6	Develop a business improvement plan within a local, national and/or international trading environment.

Table 2: Course Structure of the Diploma in Horticulture Business. Each module was taught in parallel with a Practice and Portfolio module.

Two-day face-to-face intensive, Mornington Peninsula, Victoria		
Term	Module	Sub-modules
1	1. Horticultural Management	1.1 Introduction to Horticultural Management 1.2 Risk management
	2. People and Culture	2.1 Organisation of Labour in Horticulture 2.2 Managing Human capital
2	3. Supply Chain Management and Logistics	3.1 Supply Chain Management 3.2 Value Chain Management 3.3 Logistics
	4. Financial Management and Law	4.1 Financial Management 4.2 Legal Issues in Horticulture
Two-day face-to-face intensive, Gatton, Queensland		
3	5. Horticultural Marketing and Communication	5.1 Horticultural Marketing 5.2 Communication
	6. Global Trends and International Business	6.1 Global Trends in Food and Horticulture 6.2 International Business
4	7. Innovation and Entrepreneurship	7.1 Innovation in Horticulture 7.2 Entrepreneurship in Horticulture
	8. Business Development and Strategy and	8.1 Business Model Improvement
Two-day face-to-face intensive, around Hobart, Tasmania		

Phase 2: Student perspectives on the Masterclass

Personal goals of students at the start of the course

In 2017, the Masterclass attracted 22 final enrolments, representing a range of industry professionals in horticulture from across Australia, in the vegetable, nursery and fruit and nut industries, with some operating in several areas along the horticultural supply chain. They included owners or part-owners of a horticulture business (8), senior managers of horticultural businesses (9), horticultural consultants (2), suppliers of inputs for horticultural production (2) and logistics and supply chain management (3). Most participants (77%) were between 25 to 45 years of age. Overall, 60% of students had completed a qualification equal to or higher than a Diploma. Limitations of the study are that it is based on a small number of participants from only the first year of the Masterclass. Hence, there is limited scope to evaluate the impact of recommended changes to the course on student learning outcomes.

In the entry survey, most respondents stated that they wanted to improve their business skills and develop a business and strategic plan, for example, they said; “[I want to] learn new skills that I can put in place in my business; help improve [our] current business plan; learn about other horticultural businesses and see the strategies they use” (S12). Some respondents described this in terms of wanting to improve the sustainability of their business; “...use this knowledge to strengthen the business I help to manage, increasing its adaptability and capacity to respond to new challenges.

In other words, being sustainable into the future” (S14). Other goals stated by students related to networking opportunities, professional development leading to career progression or the development of leadership skills: “Career progression, improvement of leadership of management skills, get insights from colleagues within the industry, brainstorm, build a good network”(S2).

Students’ reflections on the Masterclass delivery and content

At the end of the program, all students indicated that the relevant curricula had addressed their expectations. For example: *“I think [the program] provided a good level of overview. Obviously, other areas can be explored in greater detail, but this course provides a good stepping point (S3)”* and *“I believe the course content was interesting and covered all relevant areas of horticulture” (S6).*

Components of the curricula that were reported as more interesting and enjoyable included; preparing business plans, value chains, marketing strategy and finance, to name a few. Typically, these were related back to the participants business, for example:

Supply and value chain management - I enjoyed this section because it made me reflect on where our business is positioned. Marketing strategy – I found this interesting because again it was directly relevant to my business and provided me with potential strategies (S3).

Students stated a range of concerns in relation to the initial delivery of the P&P subjects in the mid-year survey, primarily linked to reflective practice and/or time to complete the activity. The Masterclass coordinators were responsive to these concerns and changed the delivery so that the P&P activity integrated with the course content. Reflective practice is taught and assessed in disciplines such as teaching or nursing (Mann, Gordon, & MacLeod, 2007) and is considered an important learning strategy to promote ongoing professional development. This is less evident in the sciences, but an increasing emphasis on employability and work-integrated learning in higher education curricula in the UK, Australia and Canada (Patrick et al., 2008) is leading to the adoption of the practice of critical self-reflection in assessment in the discipline, at least in some subjects (Edwards, Perkins, Pearce, & Hong, 2015).

Balancing work, study and family

Several students (40%) reported that they required between five to 10 hours per week to complete the study requirements of the Masterclass. One participant stated that; *“To do the assignments justice, I need more than 10 hours when they are due.”* Indeed, student feedback indicated that fitting the course alongside their business cycle or other commitments was at times challenging, particularly in the peak production period around September to November. *“[The] only problem was a massive spring season coinciding with the end of the course. Not enough hours in the day” (S4).* Another student stated that the lecturers were flexible about deadlines *“I found it difficult to fit the requirements of the course in with my work and family life. It was very helpful that the lecturers were very flexible about deadlines” (S10).*

The difficulties the students expressed in balancing their work, study and family (Allen, 2001) lives is typical of busy professionals who return to study. Unlike other qualifications, the Masterclass is not offered part-time, an approach that may better suit students who need to balance multiple and at times, conflicting roles. The rationale for full-time study is to maintain the students as a cohort to promote their collective professional networks, although the resultant time commitment was perceived by some students as an issue. As noted by one of the students, academics in the Masterclass provide flexibility in assignment due dates although it is unclear to us whether this concession is limited to unanticipated events in the students’ lives or is more liberal. If the latter, there are potential issues around equity and a potential need to reinforce time management skills (Trueman & Hartley, 1996). Providing potential and current students with explicit advice on the time required to undertake the course could mitigate against, but not eliminate these issues.

In contrast, one participant stated after the completion of Module 2 that:

Time to do the coursework isn't actually that demanding. Where I have spent most time is trying to apply what we have learned directly to my business (i.e. gross margin, cash flow planning).

Unlike the previous respondents, this student is integrating their study with their work activities. In doing this, the respondent is ‘closing the loop’ on their learning and putting it into practice. Students’ ability to apply knowledge to problem solving in real-life situations is considered integral to their success as a graduate (McSweeney & Rayner, 2011).

This is not to imply that the other respondents, noted above, were not necessarily doing this too. However, a disconnect between work and study could occur should the students perceive the content and assessment as less relevant to their individual circumstances. Rather than providing flexible due dates, allowing students to have options in the topic or type of assessment tasks might contribute to more purposeful engagement by students in their study.

Student learning outcomes

Students were asked mid-year if their personal goals had been met through the course to date. Around half of the respondents to the survey (n=7) stated that they were reflecting on their personal skills and attributes in the workplace, for example: *“I am analysing my management style and business skills”* (S3). Other respondents had similar observations but in the context of the wider horticulture industry, for example *“reviewing my skill set and employability, reflecting on industry and how to improve my job, farm and industry”* (S13). These observations align with CLOs 1, 2 and 3 (Table 1).

At the end of term 3, Module 6: Global Trends and Internationalisation, the concept of critical thinking and problem solving is introduced (Porter, 2008; Porter, 1979). Earlier in the Masterclass, students apply knowledge on agribusiness to their own business and personal situation. However, in this module students develop an export plan and strategy for new markets. Some students challenged its relevance:

...export strategy... was not directly relevant to my business. Some of the legal aspects were the same as well. However, I could see that all the units were relevant to horticultural business (S3).

Critical thinking and problem solving are then applied in the final two modules, one on Innovation and the last on Business Planning. Students are introduced to some of the nation's leading entrepreneurs and can draw learnings from the provided content and activities for application to their own businesses. It is from this point that students will develop the confidence to move to the final assessment task.

In the final assessment, which the Masterclass builds towards, students prepare and present a business plan to the class, academics and leading industry representatives. This high-impact learning experience consolidates the curriculum and is aligned with CLO 6 (Table 1). This task has two major learning outcomes and deliverables namely; a written business plan and secondly an oral presentation demonstrating clear and convincing communication skills. It is assessed using four criteria;

1. delivery of a business plan which is concise and easily understood, with logical and convincing argument
2. application of knowledge learned from participating in the Masterclass, covering most modules and application of this within their business plan
3. communication and delivery of a clear and concise business plan with overheads and other supporting material, and
4. demonstration of leadership skills within the horticulture sector by articulating aspects of vision, inspiration, entrepreneurial skill and innovation.

All respondents (n=13) stated that they intend to or had applied their plan to their own businesses, for example, *“[I] went over whole of business plan and reviewed the document as well as staff roles and future direction”* (S11). Some students were business managers, rather than owners, but likewise stated an intention to act on their learning (McSweeney & Rayner, 2011), for example: *“I am going to present my business plan to the owner of the business and outline my vision for the future”* (S3).

All respondents (n=13) stated that they met their personal goals on completion of the program, and in addition stated that; *“the course definitely helped me to improve my business acumen and management skills”* (S3), and *“[The course] exceeded my expectations. Some of the content I had not even considered in my business prior”* (S8). This is exemplified by the students' success, with the average grade for all modules being a distinction or higher. One student subsequently gained new employment in the horticulture sector, while another won the prestigious Women in Horticulture Award. All respondents indicated that they would recommend that colleagues take the course, for example: *“I would like all my personnel in my organisation to complete the course”* (S9).

This raises the question of how graduates of this first Masterclass implement their plan and whether their experience led to any changes in how they approach ongoing professional development, or lifelong learning. Lifelong learning is defined as learning that is pursued throughout life and allows graduates to make responsible decisions and take appropriate actions to maximise their own learning (Zimmerman, 1986). Lifelong learning crosses sectors, promoting learning beyond traditional schooling and throughout adult life (Delors, 1996). A longitudinal study of the graduates from the Masterclass will be required to address this question.

Conclusion

The objective of the Masterclass is to improve business skills in the horticultural sector. The high degree of industry engagement and endorsement as well as international collaboration in the design of the Masterclass is unique to the agricultural sector in Australia. The relatively small but diverse cohort of participants in the first year offered for the Masterclass was aligned with this objective. Students describing their goals from undertaking the course in terms of improving and applying their business skills and expanding their professional networks.

Students consistently stated the highlight of the Masterclass included the networking opportunities through the face-to-face activities and activities that were directly relevant to their business leading to the review and/or development of new business approaches that have been or are intended to be adopted. This process of adoption started during delivery of the program. By the end, all respondents stated they had achieved their personal goals on completion of the course and would recommend it to their family and colleagues. In future, for example, at one and three years after graduation, participants in the Masterclass and their employers (where applicable) should be contacted for feedback on implementation of strategies in their business.

The Masterclass team of coordinators, lecturers and industry representatives have worked together to develop an authentic program. As to be expected in a new program, some challenges have been identified in relation to delivery and the timeliness of feedback, or the integration of work integrated learning activities, which have largely been addressed during the year. Both the teaching team and participants recognise the challenge of balancing work, family and study commitments and accept that there should be a degree of flexibility for students to meet assessment criteria. In future, some of these considerations should be communicated to prospective cohorts, to inform their decision on whether to participate in the program or not.

Graduates of the Masterclass, all of whom stated that they would recommend the program to their family and colleagues, are admirable advocates for future students. The development of a strong reputation augers well for the expansion of the Masterclass both nationally and potentially internationally. This approach provides evidence for this to be a potential “blueprint” for the development and delivery of new Associate Degrees across Australia.

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