

Next Generation Technologies for Agricultural Education



The SmartFarm Learning Hub team:

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Abstract

The Australian agricultural industry faces many workforce challenges including 1. a shortage of tertiary graduates to fill available positions and 2. employees possessing the knowledge and skills of how to use the latest agri-tech tools and systems. The SmartFarm Learning Hub (the Hub) project aims to increase the employability of tertiary agricultural students by preparing them with the skills and knowledge for a successful career in an increasingly complex and highly technical industry. The Hub is a collaboration between seven universities, both here in Australia and the USA. Each participant will produce a learning module focused on inputting authentic farm data into a Real Industry Technology Learning System (RITLS) which will be placed on the Hub, a central website, allowing students across the world to access and analyse data and outline the subsequent management decisions they would make to increase on-farm profitability, productivity and sustainability.

Each of the modules will be evaluated as part of an action research cycle with the feedback received utilised to improve them for future student cohorts.

Preliminary results indicated that the project is achieving its aim, with students perceiving their employability skills to have increased as a result of completing the modules.

Introduction

The Australian agricultural industry is currently suffering from a skills shortage with an estimated 4 jobs available for every university graduate (Pratley & Botwright Acuna, 2015). Additionally, the agricultural industry has one of the lowest levels of employees with tertiary qualifications, despite the recognised and increasing complexity of the work in the sector (Parliament of Australia, 2012). Pratley (2012) estimates that around 7.8% of employees in the agricultural industry have tertiary qualifications compared with 25% the wider workforce.

As part of the Rural R&D for Profit Research Project 'Accelerating Precision Agriculture to Decision Agriculture' (<http://www.farminstitute.org.au/P2DProject>), the project team have just completed a round of eight producer/service provider workshops around Australia to identify needs in making precision agriculture (PA) work for them (providers and consumers of services). It highlighted training, and in particular tertiary agriculture education as requiring content modification to reflect the technology and data needs of contemporary farming practice. The SmartFarm Learning Hub (the Hub) is one way to bring real data to life and in doing so it opens up dialogue and encourages exploration of the enabling sensor technologies, the telecommunications networks/systems that carry the data and information, the platforms that host the data and of course the analytics behind the scenes. In short it is one (of many) innovative approaches to addressing the gap currently existing in tertiary education (as perceived by those who work in the sector - some of them graduates from as recent as last year) (D. Lamb, personal communication, May 30, 2017).

The Hub is a collaborative project between 7 universities (namely the University of New England, University of Tasmania, University of Central Queensland, University of Southern Queensland, University of Melbourne, University of Sydney and New Mexico State University), each developing a learning module using a real industry technology learning system (RITLS). Each of the participating universities have farms representing a varied range of enterprises and environmental conditions, from highly productive dairy systems in Tasmania to tropical beef production in North Queensland and the arid rangelands of New Mexico. Each module will be made available via Creative Commons Attribution-ShareAlike license (<https://creativecommons.org/licenses/by-sa/4.0/legalcode>) allowing education in institutions across Australia and the world to deliver the material to their students, exposing them to agricultural data from a range of enterprises and geographical locations. The objective of the Hub is to address two key issues faced by the agricultural industry: (1) Provide students with the necessary skills and knowledge required for a successful career in a constantly evolving, increasingly complex and technical field; and (2) Increase the number of people considering a career in the sector by demonstrating the innovative nature of agriculture, inspiring students from a younger age to undertake tertiary study leading to a career in agriculture.

Method

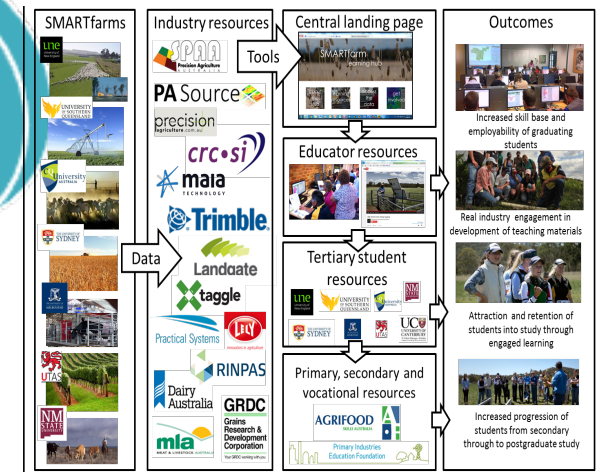
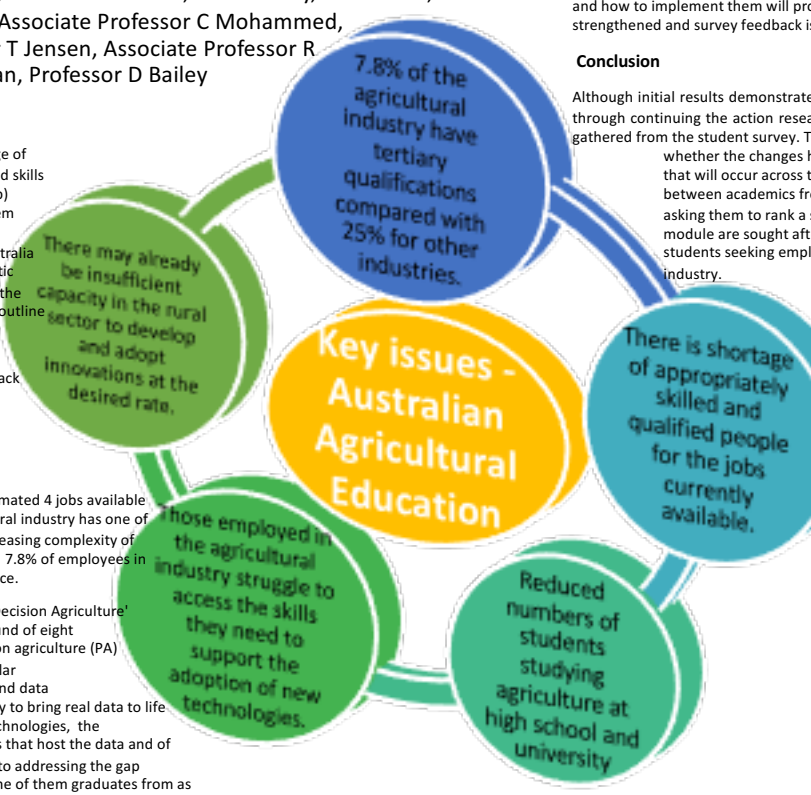
Each learning module will be evaluated in an action research context (McTaggart, 1991) providing both research outcomes and critical feedback to improve the materials. Students are invited to complete a survey at the conclusion of the practical asking their perception on a range of aspects, including whether they perceived the learning outcomes (derived from Learning and Teaching Academic Standards Statement for Agriculture (Botwright Acuna & Able, 2016)) were achieved, the level of enjoyment of the content and learning experience, the applicability of the learning module to future employment, ICT skills, the system usability and their demographic details. The survey consisted of Likert scale questions (Likert, 1932).

Results and Discussion

The preliminary feedback from students is that the modules are achieving their objective to increase employability skills, with the majority of responses 'strongly agreeing' or 'agreeing' with the statements posed. One student commented: As the digital age moves forward, experts too must become mobile, and data ready at all times. Having knowledge about such technologies and how to implement them will prove fruitful. However, there is the opportunity for certain aspects of each practical to be strengthened and survey feedback is being used to amend each learning module for future student cohorts.

Conclusion

Although initial results demonstrate that the learning modules are achieving their objective of increasing employability skills, through continuing the action research cycle, each of the RITLS learning modules will be improved based on the information gathered from the student survey. The practicals will be delivered to different cohorts of students in 2017 and re-educated to whether the changes have been effective. Another benefit derived from the project is the collective learning that will occur across the universities as a result of sharing data and learnings based on student feedback between academics from different institutions. A sub-project of the Hub project will be to survey employers asking them to rank a series of CV's to determine whether the skills obtained from completing a RITLS learning module are sought after and valued by the agricultural industry. This will provide important information to both students seeking employment and education providers preparing students for a career in the agricultural industry.



Real working farms will be linked with established industry tools to provide unique learning experiences for student

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