

Setting the scene: ePortfolios for students in agriculture/agribusiness disciplines

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ePortfolios are a collection of digital evidence demonstrating learning over time, and are a high-impact practice for students that can be curated for specific audiences. In multidisciplinary programs, such as agriculture/agribusiness, students often have nuanced learning journeys and graduate with a range of skills and work-integrated learning (WIL) experiences. It can be difficult for both students and potential employers to recognize the depth and breadth of the students' individual learning journey, and the skills that they possess. Integrating ePortfolios into an agriculture/agribusiness program has the potential to improve outcomes for student, institution and employer by providing an innovative solution to this tension. It can encourage students to develop technological and reflective skills, as well as highlight their specific WIL experiences, knowledge and understanding. However, while ePortfolios can be a powerful tool, there are challenges to successful implementation. These are addressed via a series of research-driven recommendations.

KEYWORDS: ePortfolios, technology-enhanced learning, agriculture, agribusiness, employability skills, inductive study

The unprecedented modality shift experienced in tertiary education during the COVID-19 pandemic has led to a renewed focus on emerging technologies to support transformative teaching and learning. During the rapid shift to online and technologically supported learning, and to ensure it is sustainable, meaningful, and transformative, educational processes and practices must be constructed on research-driven educational principles. This will allow education to attain optimal outcomes from emerging pedagogies whilst retaining the best of traditional in person, face to face only approaches (Konrad et al., 2015). The ePortfolio is not a new tool for enhancing student outcomes, indeed it has a history dating back to the early 1990's (Farrell, 2020). However, advances in technology and the move to embracing digital platforms as opportunities to strengthen learning experiences and improve access and equity, has reinvigorated discourse on the value of ePortfolios (Carter, 2021). This discussion has arisen in many disciplines, including the agriculture/agribusiness discipline, which encompasses all student programs and industries that are involved in the production of food. As agricultural industries are increasingly highlighted as important for economic productivity, there is a pressing need for quality graduates in the agriculture/agribusiness disciplines and closer liaison between universities and industry (Bennett & Low, 2021; Pratley, 2016). Exploring the use of ePortfolios within the agriculture/agribusiness discipline, investigating the benefits and challenges of using ePortfolios to students and as a tool in gaining future employment are of particular importance when considering the past, present and future of agri-education, and connecting the skills that these graduates possess with

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the variety of career paths from which they must choose. The ePortfolio as a teaching and learning resource for agriculture/agribusiness disciplines has the potential to build student agency and encourage university-industry partnerships, as well as establish effective traditional learning processes in online spaces to encourage life-long learning.

BACKGROUND OF EPORTFOLIOS IN HIGHER EDUCATION

ePortfolios are a collection of digital artefacts which can be curated for display to an intended audience. Portfolios have been used in tertiary education for many years, described as “a fusion of processes and product ... the processes of reflection, selection, rationalization, and evaluation, together with the product of those processes” (Winsor & Ellefson, 1995, p. 68). ePortfolios are high impact practice (Watson et al., 2016) for designing learning and assessment opportunities with the support of digital media and have been utilized in both formal and informal learning contexts, to scaffold, record and demonstrate learning processes and products (Buchem, 2016; Carter, 2021). It has also been argued that intrinsic motivation (Winne & Hadwin, 2012) and independent learning skills can be developed via ePortfolio andragogy in the curriculum (Chau & Cheng, 2010). Bolliger and Shepherd (2010) agree that learner autonomy is strengthened by integrating the use of ePortfolios with the development of students’ critical thinking and problem-solving skills. Student investment in collating artefacts that evidence the process of learning is fundamental to developing these skills. For optimal outcomes, students must take ownership and accept responsibility for the quality and outcomes afforded from the ePortfolio (Winne & Hadwin, 2012). The ePortfolio promotes self-regulated learners, ultimately leading to improved academic success, with an intrinsic link to lifelong learning (Buchem, 2016; Peet et al., 2011; Winne & Hadwin, 2012).

According to Buchem (2016, p. 343) key purposes of the ePortfolio include “demonstrating learning achievements (assessment), recording a learning process (journaling) and demonstrating skills (profiling).” Much like their non-digital predecessors, ePortfolio artefacts are intended to demonstrate the skills, competencies, assessments, reflections and overall learning journey of students, which can then be used to build academic identity and crafted for a targeted audience (Watty & McKay, 2015). Types of evidence in an ePortfolio can include writing samples, stakeholder feedback, evaluations against industry criterion, photographs, videos, certificates, badges and reflections (Butler et al., 2006). Reflection, in particular, has been identified in much of the literature addressing transformative and experiential learning theories as a valuable educational tool (Mueller & Oguro, 2022), providing it is intentionally designed, and effectively guided and/or modelled (Stefani et al., 2007). Ring et al. (2016) suggest that ePortfolios should be considered as a stream of evidence of students’ achievement rather than a periodic snapshot – described by Buchem (2016) as a story rather than a conclusion. ePortfolios have multiple purposes in higher education which can be captured within the assessment, journaling and profiling framework (Buchem, 2016). These are outlined below.

Assessment

Assessment drives student learning and validates student achievement in higher education. Gibbs (1999, p 41) argues that assessment is “the most powerful lever teachers have to influence the way students respond to a program and behave as learners.” However, traditional assessment practices in higher education measure understanding utilising mostly summative techniques, such as standardized testing (Chau & Cheng, 2010). ePortfolios provide teachers with an assessment methodology that captures the multi-faceted, intricate nature of student learning (Chau & Cheng, 2010; Cummins & Davesne, 2009) and links real-world learning, also termed work-integrated learning (WIL), with

classroom learning (Eynon et al., 2014). An assessment portfolio is therefore one that has been created where the focus is explicitly on external evaluation or judgment whether it be formative or summative evaluation of learning (Abrami & Barrett, 2005). An obvious context in which this can be applied is in the use of ePortfolios for assessment in disciplines requiring student placements, such as teaching and midwifery, where the collection of work can be used as evidence in future transition to the workplace (Andre, 2010). However, as long as assessment is meaningful, carefully structured through scaffolded tasks, and feedback to students is provided in a timely and dynamic manner, then integrating ePortfolios into assessment tasks can be a valuable addition in any discipline (Ferns & Comfort, 2014; Hatzipanagos & Lygo-Baker, 2012).

Journaling

Secondly, ePortfolios in higher education support students to develop, demonstrate and reflect on their learning over time (Chau & Cheng, 2010; Jisc, 2008; Stefani et al., 2007). In this context, students are active agents in the portfolio creation, reflecting on collected evidence during their learning journey (Ferns & Comfort, 2014; Hatzipanagos & Lygo-Baker, 2012). The benefit of ePortfolios, compared to traditional portfolios or other agents in this role, is that technology allows evidence to be built incrementally during their progression through higher education and as lifelong learners (Ferns & Comfort, 2014; Peet et al., 2011), making learning more visible to students (Eynon et al., 2014). According to Jisc (2008), students are more likely to both reflect upon and comprehend knowledge when guided use of ePortfolios is effectively integrated into learning activities. Effective integration is argued to include student ownership and choice, scaffolded tasks and support, and buy in from stakeholders (Jisc, 2008), elements which improved both student outcomes and retention in higher education (Peet et al., 2011). For example, Aguiar et al. (2014) investigated the use of guided reflections in ePortfolio assessments in a first-year engineering program. It was found that a positive relationship exists between the number of times first-year engineering students engaged with their ePortfolios and student retention in the program. Evidence advocates that using ePortfolios in higher education demonstrates to students the importance of reflective practices and life-long learning, and also provides tertiary students with a framework and instrument with which this can be achieved (Buchem, 2016; Ferns & Comfort, 2014).

Profiling

A showcase ePortfolio is one that an individual purposefully curates to establish their competence, skills and/or achievements (Buchem, 2016). This may be to demonstrate competency to potential employers in job applications (Chau & Cheng, 2010; Willis & Wilkie, 2009), or to validate proficiency against professional development and external accreditation requirements (Abrami & Barrett, 2005; Hatzipanagos & Lygo-Baker, 2012; Zeichner & Wray, 2001). As some professional bodies include accreditation requirements, such as nursing and teaching, a suitably-curated showcase ePortfolio is an increasingly familiar manner of providing evidence of competency, either as graduating students seeking initial registration, or as evidence of on-going professional development (Ferns & Comfort, 2014; Hatzipanagos & Lygo-Baker, 2012). A key element of a showcase portfolio, as argued by Abrami and Barrett (2005), is the illustration of the learning, as compared to simply identifying or describing. Demonstrating evidence of abilities, and matching them to employer needs, is traditionally initiated during recruitment processes via resumes and cover letters, and lack of these elements are two of the common reasons for early rejection of a candidate (McDowell, 1987). While a simple concept, in practice this is complicated by the requirement of evidencing a complex combination of multi-contextual core and transferable skills to be assessed by potential employers (McQuaid & Lindsay, 2005;

Yorke, 2006). With this in mind, the importance of having a repository to draw on when required to exhibit skills to potential employers, and the potential benefits of curating this via a dynamic, portable and contextual showcase ePortfolio is clear.

COMPLEXITY OF SKILLS DEVELOPMENT IN AGRICULTURE/AGRIBUSINESS DISCIPLINES

The spectrum of potential careers in the agriculture/agribusiness discipline covers a widely diverse range of professions and job types. Career opportunities include farming, finance, engineering, communication, advisory and consultancy, research, and education. A key defining feature of the agriculture/agribusiness discipline is its multidisciplinary nature, with agriculture and agribusiness programs comprised of subjects from different scientific disciplines as well as disciplines outside science including social sciences and economics (Botwright Acuña & Able, 2016). Agriculture encompasses practical/vocational skills combined with applied science and management that covers a wider range of WIL and agricultural sub-discipline experiences. Graduates are expected to be able to incorporate science and vocational skills and understanding to agricultural systems through inquiry and problem solving, communication skills and professionalism (Wilkes & Burns, 2019).

On graduation, students enter professions and develop careers that are as widespread as the diversity within their programs. Pratley (2012) highlighted the diversity in required skills for professionals, stating that farmers and advisers need to be able to deal with normal production issues, be self-reliant in the marketing of their products, increasingly be able to manage the impacts of climate variability, deal with increasingly complex and regulatory compliance issues, manage the landscape for biodiversity and sustainability, and address carbon emissions and carbon accounting. It is therefore imperative that students are provided with the opportunity to sample a range of experiences and to collect evidence of the diversity of professions and skills that they have been introduced to during their programs, as well as learn to articulate these to stakeholders in their desired industry.

Performance in the workplace requires a combination of both professional, or 'soft' skills, and technical skills. Technical skills can be aligned to technical achievements or capabilities, whereas professional skills have many definitions and can be aligned with the approach to and management of tasks (Juhász & Horváth-Csikós, 2021). Professional skills identified in several studies include teamwork, initiative, decision-making, planning and organizational skills, time management, critical thinking and problem solving, ability to adapt to change, communication across diverse audiences and networking capabilities (Farias, 2016; Garwe, 2020; Juhász & Horváth-Csikós, 2021). The perceived gap between academic programs and skills required by agricultural employers may be due to a lack of understanding of the skills and/or the capability to incorporate and demonstrate them into an academic program (Robinson et al., 2007).

Entrepreneurship and innovation play a key role in combatting problems facing agribusinesses, including the need for water conservation, sustainable packaging, and environmental protection (Higgins et al., 2018). Being innovative is an important quality for an agricultural entrepreneur, especially when the business faces intense competition and operates in a rapidly changing environment. Successful agribusinesses are those who adapt to changing environments to capture the opportunities from such disturbance and outperform those who do not adapt (Shadbolt & Olubode-Awosola, 2016). It was once thought that entrepreneurial skills were innate, but now research has led to the conclusion that entrepreneurial education and exposure to entrepreneurial activities can help build a strong entrepreneurial skillset (Charney & Libecap, 2000; Souitaris et al., 2007). The demand for entrepreneurial education has increased globally, especially at the undergraduate level (Higgins et

al., 2018; Robinson & Josien, 2014). The challenge to educational institutions is to build these skills through the undergraduate program, within and across academic subjects and linking development through the program from entry to exit (Farias, 2016). The responsibility for producing graduates that are considered highly employable should be shared between employers, educators, and students/graduates (Farias, 2016) enabling students to graduate with breadth and depth across a variety of experiences.

Businesses are often looking for work-ready employees (Garwe, 2020; Noel & Qenani, 2013) rather than employing students initially in graduate-trainee positions. WIL provides students with opportunities to learn at and through work (Garwe, 2020), including outside of the university environment. Work experience and practical experience were historically core components of all agriculture/agribusiness programs but have been slowly eroded from many programs due to changes in program structures, time frames and the focus of agriculture programs (Low & Bennett, 2019). WIL is also increasingly embedded and is an inherent component of many subjects within a university program, particularly in the later years of the program, with students being taught and using both industry-required tools and skills (Bennett & Low, 2021). These are particularly important for students entering employment in agricultural industries as they are often working in isolation in remote areas without easy access to more senior staff mentors. Student transcripts on graduation list subjects completed but does not provide details of what has been accomplished within those subjects. It also does not list work experience completed as a requirement for graduation. Identification of the skills through ePortfolios that students have been exposed to and have competency in using therefore provides them with a clear advantage in job applications. Garwe (2020) has identified that WIL enables students to link theory and practice, gain an understanding of the work environment and culture, develop a professional identity, and establish broader networks. The impact of timing of WIL through the academic program is also influenced by student age and prior experience. WIL may help the student identify relevance of academic learning as well as identify knowledge gaps.

Pratley (2012) published a report stating that there are more than 4000 jobs advertised in agriculture and related industries each year, yet the number of graduates continues to decline and is currently supplying only 20% of the number required to satisfy the job market. A further report by Pratley (2016) found in a survey of graduates four to six months after graduation, all who wished to be in employment, had entered the workforce. This data does not include those who have gone onto further study or are not seeking work. This provides evidence that agriculture graduates are in high demand and have better prospects than graduates in other professions, with the statistics suggesting a buoyant market with five jobs available per graduate (Pratley, 2016).

BENEFITS AND CHALLENGES OF EPORTFOLIOS TO EMPLOYERS OF AGRI-GRADUATES

As globalisation and technological advances in agriculture and agribusiness professions have accelerated, so too has the range of employer requirements of a graduate in industry. Noel and Qenani (2013) argue that requirements for graduates change dramatically as technologies and innovations are integrated into the agricultural industry, which results in employers becoming progressively more demanding of graduates. Employees in agribusiness and agriculture find themselves needing to regularly retrain and transfer knowledge (Inegbedion & Islam, 2020) with knowledge and skills from industries outside the agricultural field being adapted and modified for their inclusion within agricultural practise (Bassett et al., 2022). Employer requirements of graduates are becoming both more specific in the knowledge they require, but also requiring a greater range and depth of knowledge. In a typical 3-year full time timeframe of most agriculture/agribusiness programs, it is not possible to

ensure students learn all the knowledge that they will require across the broad range of industries they will enter. Therefore, ensuring that students are exposed to the broad range of skills and specific knowledge required, and encouraging them to be life-long learners that have the ability and desire to upskill throughout their career, is an important requirement of university courses. However, for students, recognizing and providing evidence of this can be challenging.

These tensions can be addressed via use of the ePortfolios in recruitment and advancement processes. Given that an ePortfolio can be curated to be fit for purpose, users can demonstrate both disciplinary knowledge and professional skills (Chau & Cheng, 2010), tailored to be relevant to the employer and the nuances of the desired position. A properly curated ePortfolio allows the applicant to demonstrate integration of knowledge from different discipline areas and their ability to apply integrated knowledge in practice (Chau & Cheng, 2010). Through the artefacts selected, employers can get a better feel for the applicant (Coffey & Ashford-Rowe, 2014), potentially ensuring a more informed applicant choice compared to a traditional resume and cover letter combination.

Some challenges remain unaddressed, however. As a result of the diversity of recruitment practices, an ePortfolio may be difficult to tailor to the specific circumstances and may not be seen by the potential employer (Andre, 2010; Hatzipanagos & Lygo-Baker, 2012). Given the novelty of ePortfolios in recruitment, employers may not understand the purpose of an ePortfolio if one is provided as an alternative to a resume and/or cover letter, and may not be able to guide applicants to provide suitable evidence to demonstrate their skills (Watty & McKay, 2015). If selection criteria for job applications are inaccurate or unclear, then the artefacts selected by the student may not be relevant. Similarly, there is a question whether employers themselves understand the breadth of the education that agribusiness and agricultural graduates receive, how that may be applied in their industry, and what forms of evidence can be used to effectively demonstrate competency in these (ePortfolio Hub, 2016; Heinrich et al., 2007). Employers must also learn how to ask the 'right' questions to ensure they can hire the best candidate, rather than the candidate who is most skilled at interviews (ePortfolio Hub, 2016). These challenges are not unique to potential employers of agriculture/agribusiness discipline graduates but are likely to be a consideration to many industries with a breadth of careers available to students.

BENEFITS AND CHALLENGES OF EPORTFOLIOS TO STUDENTS IN AN AGRI-DISCIPLINE

Tertiary education should help students gain future employment and provide students with the opportunity to curate their professional identity (Carter, 2021; Daniels & Brooker, 2014). Carter (2021) argues for the value of using ePortfolios as a tool to assist students to reach these outcomes, whether they be utilized to demonstrate capabilities, as artefact repositories and/or as reflective tools. The reported benefits of this to students includes an increased sense of learner ownership and awareness of the learning process (Abrami & Barrett, 2005; Ferns & Comfort, 2014), a deepened and more authentic learning experience (Mikhailova et al., 2014) and proficiency in the technical skills that developing an ePortfolio and associated collation of electronic evidence requires, such as technological competency and reflective writing (Ferns & Comfort, 2014). Students also have a tendency to compartmentalize their learning into the different subjects through their program, and consequently often struggle to build on knowledge or skills gained from one subject to the next. The use of ePortfolios requires students to document their learning journey in a format that is not compartmentalized into subjects and thus has the potential to become a valuable component of a student's learning journey, increasing a student's ability to become a systems thinker, rather than operating within the narrow constraint of specific subjects. This is a vital skill for graduates entering agriculture/agribusiness industries and is discussed in more detail later.

One of the primary benefits of using ePortfolios as a learning tool is the increase in student awareness of their learning journey. Students generally self-monitor as they progress, and this combined with insightful feedback from others, including peers, lecturers, and industry placements, can support or challenge student perception of their skills and knowledge (Chau & Cheng, 2010). This awareness can be a useful tool in improving student achievement and in giving them greater confidence in their ability. Combining elements of both process and product in ePortfolio development, provides students with a visual representation of their transformation over time (Carter, 2021) and a mechanism by which their learning journey may be evidenced in the future (Buchem, 2016).

An increase in the personal commitment by the student to and ownership of both their learning and the artefacts curated to exemplify this, is a demonstrated advantage of implementing ePortfolios as a learning tool. This is also known as an increase in student agency. Ciesielkiewicz (2019) and Carter (2021), among others, argue that the use of ePortfolios encourages students to take active responsibility for their learning. The case study detailed in Bolliger and Shepherd (2010) supports the idea of an increased desire to learn and indicates increased connectedness between peers and staff as an additional benefit - perhaps associated with student agency. This agency is a vital cog in the development of professional identity; students need to be actively engaged in the demonstration of skills and knowledge of their chosen profession (Trede et al., 2012). The selection of, curation of, and reflection on choosing artefacts for an ePortfolio encourages the student to consciously take ownership of their learning, and personally commit to their development (Chau & Cheng, 2010).

Developing an effective ePortfolio requires proficiency in a variety of technical skills, as well as ability to analyze and select artefacts suitable to address the purpose and/or success criteria of the portfolio. While the required technical skills may be contextual to different platforms, most students using ePortfolios as a learning tool are likely to improve proficiency in information and communication technology (ICT) skills, also known as digital literacy skills, such as creating and tagging digital artefacts to suit a particular audience, and use of specific software or technology suites, for instance Microsoft 365 or Google Workspace (Carter, 2021; Hatzipanagos & Lygo-Baker, 2012; Mikhailova et al., 2014). This combination of improving technological, content-specific and reflective skills afforded by the use of ePortfolios have been found to have potential for better outcomes for students, either as deeper learning outcomes (Bolliger & Shepherd, 2010) or in future employment (Andrade & Ziegner, 2021).

ePortfolios also provide the opportunity to be powerful platforms that can be used for sharing ideas, promoting peer collaboration and interaction, and providing feedback on performance from multiple stakeholders. However, students tend to underestimate the value and impact of peer feedback (Chau & Cheng, 2010) which compromises the potential outcomes from peer relationships. To optimize the benefits of the ePortfolio, reflective skills; giving, receiving, and responding to feedback; and the capacity to identify artefacts that evidence skill development need to be embedded in curriculum. Students should 'own' the ePortfolio but require support, guidance, and feedback as they curate and share the platform.

Given the breadth of workplaces available to a graduate of an agriculture/agribusiness program, student use of ePortfolios as a repository and showcase of skills and knowledge can play an important role in demonstrating employability skills. Employability involves capability of the graduates to apply both degree-based and interpersonal skills, knowledge and processes to the workplace (Garwe, 2020). Employability in tertiary education has previously been viewed as an additional measure to enhance employment prospects and meet university targets, it is now seen as a core component of the tertiary

curriculum, intentionally embedded across the student learning journey with meaningful learning opportunities (Jackson & Bridgstock, 2021). While the suitability of ePortfolios as a tool to evidence professional standards for external accreditation and professional accountability is obvious (Carter, 2021; Sharifi et al., 2017), their potency may be higher in disciplines with diverse student learning journeys. Buchem (2016) argues the value of ePortfolios as an instrument that can bring together learning from a variety of contexts, both formal and informal, which is consistent with finding a solution to evidence the student learning journey in a diverse and multidisciplinary discipline, such as agribusiness.

While ePortfolios are valuable repositories for students to collate testimony relating to skill and knowledge acquisition, and monitor personal and professional development (Ferns, 2018), compiling the ePortfolio is potentially challenging for students. There are many skills inherent in a quality ePortfolio including the ability to identify artefacts that evidence capabilities, reflect on progressive development, digital literacy and select and organize an ePortfolio platform that students will need to be taught at the beginning of their university courses. Many artefacts will evidence a number of capabilities, rather than just a single capability, and therefore it will be important for students to know how to 'tag' artefacts, so that they can be identified under the range of skills for which they show evidence. This is one of the benefits of using ePortfolios, rather than a more traditional paper-based portfolio, but is also one of the challenges.

Traditionally, assessment practices are dominated by measurement and grades with a focus on knowledge recall (Hodges, 2011; Yorke, 2011). Given that assessment is the driver of student learning (Ramsden, 2003), students are conditioned to 'perform' in 'teacher-structured' tasks as opposed to real-life, evidence-based and student-structured assessments characteristic of the ePortfolio. The contemporary agenda in higher education advocates for students to take ownership of their learning whereby they identify personal strengths and areas for improvement facilitating continual growth and improvement, and this has the benefit of enabling assessments to sit within ePortfolios more clearly. However, assessments continue to be 'teacher driven' and confined by institutional governance around assessment protocols, although there is evidence that assessments can be industry-driven and still meet the required university unit learning outcomes (Bennett & Low, 2019, 2021; Low & Bennett, 2019, 2021), and it can be argued that teachers within agriculture/agribusiness disciplines have moved to industry-driven assessments to a greater degree than in other more pure disciplines as a result of close linkages with industry within university courses/programs. A genuine ePortfolio assessment goes beyond the first steps of generating industry-based assessment, instead requiring the assessment to utilize the full suite of ePortfolio capabilities (Cambridge, 2010). However, transitioning to a model of assessment that relies on student agency and creativity is a major cultural shift, and the challenge for students is to be actively engaged in the process of organizing, integrating, and reflecting on achievements. To achieve optimal outcomes, students need to develop expertise in self-assessment rather than relying on the use of assessments set within units to develop their ePortfolio, where they recognize success and how they might address areas for improvement (Linnakyla, 2001). Digital portfolios have the potential to be catalysts for moving to a more student-driven approach and promote meaning and relevance for the assessment process (Herrington et al., 2009). Furthermore, through collating evidence of personal development and recognizing progressive development, ePortfolios enable personal reflection on their expanding professional capacity.

To create an interesting ePortfolio that captivates the reader, students need to be proficient in using a variety of media, including visual, animation, textual and audio (Heinrich et al., 2007). Additionally, identifying artefacts that verify capabilities is often a difficult concept for students. Sourcing proof that

showcases skills employers are seeking and targets a particular audience, is a difficult concept for students to grasp and enact, particularly at the start of their university studies. The ePortfolio is, however, a dynamic tool that evolves and matures as students build proficiency and expand networks and opportunities. A quality ePortfolio requires students to have expertise in time-management, organizational structure, and the capacity to recognize personal development.

BENEFITS AND CHALLENGES OF AGRI- PROGRAM EPORTFOLIOS TO INSTITUTIONS

Pedagogical Placement

The task of embedding ePortfolios into a tertiary agri-discipline program is faced with a variety of different challenges which can be grouped in terms of the value of the ePortfolio regarding relation to pedagogy, institutions, technology, and staff. ePortfolios offer personalized constructivist learning opportunities for students that may also provide tangible benefits outside their academic setting (Chau & Cheng, 2010), but implementation of student ePortfolio development requires decisions to be made about its rollout and use, each of which affect the value of the ePortfolio not only to the student, but to staff, and potential employers (Eynon et al., 2014). Agriculture and agribusiness programs are typically applied in nature and focused on the specific scientific and business knowledge and skills that can be translated to industry requirements. Students and staff therefore are likely to be unpracticed in the art of reflecting or documenting artefacts or achievements. Staff and students will therefore need instruction in ePortfolio development and the value of reflection. Within the context of shifting the teacher-student relationship from a positivist to a constructivist paradigm, these purposes can be both formative and summative, resulting in a range of outcomes rather than a dichotomy (Van Tartwijk et al., 2007). The development of an ePortfolio is a complex task that provides meaningful assessment of student learning (Cheng & Chau, 2013; Zhou & Helms, 2015). This moves away from more traditional and standardized assessment methods, however, requires support from both the academic institution and its staff to be successful (Van Tartwijk et al., 2007).

The function of the ePortfolio to represent students' achievements over time poses an additional dilemma as to how its development is embedded in a curriculum. While an ePortfolio would be a valuable tool for program-wide assessment (Zhou & Helms, 2015), a top-down mandate to build an ePortfolio across a whole of a degree may represent a hidden assignment or coercion to devote extra time and effort, resulting in resistance, frustration, and an erosion of motivation (Chau & Cheng, 2010; Van Tartwijk et al., 2007). Recent findings by Ciesielkiewicz (2019) indicate that the value and usefulness of an ePortfolio represents the single greatest factor in intrinsic motivation to develop it. With this in mind, ePortfolio relevance and benefits must be intentionally developed and reinforced throughout the program, rather than embedded in a single subject with the intent to include it as an assessment task. This raises the question, however, of where in a program's curriculum the ePortfolio should be included; whether it should be near the commencement or completion of the program. It similarly raises questions as to how, or whether, the tasks used to embed the ePortfolio pedagogy should be assessed by staff. The benefits of introducing the concept and development of ePortfolios early in a program is that students have the platform set up to continue to use and build on through their program. Although, as discussed earlier, they may lack the maturity to use an ePortfolio effectively, ePortfolios can be modified as the students gain confidence and understanding of their work. Much of the literature, including Ciesielkiewicz (2019), Ferns and Comfort (2014) and Zhou and Helms (2015) support the embedding of ePortfolios early in a degree, with opportunities to build upon it as a repository for genuine assessments which evidence students' skill acquisition throughout the program. This aligns with underlying connectivist (Buyarski et al., 2017) and constructivist (Carter,

2021) learning theories inherent in ePortfolio pedagogy. It is therefore recommended that it is introduced early within a course and is embedded throughout. It is also important to stress that an ePortfolio should not be viewed as an assessment in its own right, but is a repository for industry aligned assessments, which evidence students' skill acquisition through their course, and beyond.

ePortfolio Platform

In addition to the pedagogical placement of an ePortfolio within the curriculum, more prosaic decisions must be made regarding the platform used to develop the ePortfolios and the associated institutional support. As noted above, the success of ePortfolio development depends largely on students' perceived value and usefulness of the ePortfolio (Ciesielkiewicz, 2019). Critical to this value is the ease with which students can develop their ePortfolio. To be effective, the ePortfolio platform must be user friendly within an underlying reliable infrastructure (Zainal-Abidin et al., 2011). Consequently, the choice of ePortfolio platform is a non-trivial decision with a variety of facets to consider, including the support available for the platform from both its producer and the academic institution, the accessibility and privacy settings of the platform, and the more fundamental question of whether a specific platform should be prescribed (Richardson et al., 2020). Further aspects to heed include management of risk to students with regard to student (and employer) access to ePortfolios after graduation and portability of ePortfolios to external locations for storage (Richardson et al., 2020). In the budget-conscious academic environment, platform cost can be a determining factor (Richardson et al., 2020; Slade et al., 2013). This requires strong institutional commitment to strategic direction and funding (Hallam & Creagh, 2010).

Institutional commitment to ePortfolios is not only crucial with regard to technology selection and support, but even more importantly, with leadership from decision-makers, faculty, and staff. High-level direction must be provided in relation to policy development, resourcing, and intellectual property rights (Schwartz, 2009). Buy-in from faculty and support staff of the benefits of ePortfolios as a pedagogical tool enables them to demonstrate the value of ePortfolios to students (Summers et al., 2020). Upskilling faculty, particularly in awareness of teaching beliefs and its integration with innovation, can be key in the successful implementation of ePortfolio programs (Ring et al., 2016). As ePortfolios are intended to be a showcase of an individual's work throughout their career, effective introduction of ePortfolios to students needs to include teaching lifelong learning strategies, managing risk, and producing evidence (Heinrich et al., 2007). The necessary foundation to this, as described by Summers et al. (2020) and echoed by Ring et al. (2016) is high-level institutional leadership aligned with front-line adoption of ePortfolios by instructors as a repository for useful assessment tasks, representative of the changing teacher-student relationship (Van Tartwijk et al., 2007).

RECOMMENDATIONS FOR THE IMPLEMENTATION OF EPORTFOLIOS IN AGRI-EDUCATION

Several recommendations relating to the application and implementation of ePortfolios in the discipline of agriculture/agribusiness emerge from the insights in this paper. Recommendations fall broadly into three categories. Category A recommendations relate to curriculum and assessment design, and the importance of evidencing the process of learning through reflection rather than the product. Recommendations in Category B are concerned with stakeholder responsibilities in the implementation of the ePortfolio: students, teaching staff, and industry. The final recommendation, Category C, underpins all other recommendations as it highlights the importance of the platform and the creativity and flexibility the chosen platform affords students.

Category A

1. ePortfolios should be implemented at a whole of program level to demonstrate progressive student development throughout agriculture/agribusiness degrees to capture variation of skills for diverse employment opportunities.
2. Artefacts in the ePortfolio should evidence the process of learning and skill development relevant to the agriculture/agribusiness workplace.
3. Assessment tasks in agriculture/agribusiness programs should be designed to ensure evidence of learning outcomes and suitability as artefacts in the ePortfolio to evidence employability skills and/or skills required by regular graduate employers.
4. Reflection on personal strengths and areas for improvement in an agricultural context, and opportunities for peer feedback should be incorporated in the ePortfolio.

Category B

5. Agriculture/agribusiness students should 'own' the ePortfolio and be responsible for the quality, management, and currency of their ePortfolio.
6. Teaching staff in agriculture/agribusiness disciplines should be provided opportunities to build their capacity in implementing the ePortfolio in teaching programs.
7. Collaboration with agriculture/agribusiness industries should inform the purpose, value, and content of an ePortfolio and enable clear communication of the benefits of an ePortfolio.

Category C

8. The ePortfolio should be built on a user-friendly and portable platform, affording students creativity and flexibility in determining the structure and compilation of the ePortfolio.

CONCLUSION

ePortfolios provide a creative and flexible device for agriculture/ agribusiness students to identify and showcase the range of skills and abilities they have developed in their undergraduate studies, in order to draw on these experiences to demonstrate skills to employers. The breadth, depth, and interdisciplinarity of the agriculture/ agribusiness field, in particular the nuances associated with embedded WIL, presents substantial obstacles to students attempting to highlight evidence of their learning and competencies to match employer needs. By allowing students to showcase more than program transcripts and marks through evidence and reflection on their experiences, ePortfolios provide a stronger tool for students to use to provide evidence to agri-industry employers of their suitability for a position than resumes or cover letters. However, adoption of ePortfolios as a repository of assessments and student achievements by agriculture/agribusiness undergraduate programs faces institutional and curricular challenges, as it does not sit clearly within unit or course learning outcomes and thus can be seen by students as a non-assessed and therefore a non-critical component of their course. Additionally, the relatively novel use of ePortfolios in agri-discipline hiring means that while there is industry stakeholder buy-in for their implementation, additional clarity is needed for both employers and universities on their use. The literature indicates, however, that ePortfolios can be a powerful tool for employers and universities wanting to gauge the capabilities of graduating students as graduates approach a job market desperately seeking qualified, industry-ready employees.

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About the Journal

The International Journal of Work-Integrated Learning (IJWIL) publishes double-blind peer-reviewed original research and topical issues related to Work-Integrated Learning (WIL). IJWIL first published in 2000 under the name of Asia-Pacific Journal of Cooperative Education (APJCE).

In this Journal, WIL is defined as " *An educational approach involving three parties – the student, educational institution, and an external stakeholder – consisting of authentic work-focused experiences as an intentional component of the curriculum. Students learn through active engagement in purposeful work tasks, which enable the integration of theory with meaningful practice that is relevant to the students' discipline of study and/or professional development*" (Zegwaard et al., 2023, p. 38*). Examples of practice include off-campus workplace immersion activities such as work placements, internships, practicum, service learning, and cooperative education (co-op), and on-campus activities such as work-related projects/competitions, entrepreneurships, student-led enterprise, student consultancies, etc. WIL is related to, and overlaps with, the fields of experiential learning, work-based learning, and vocational education and training.

The Journal's aim is to enable specialists working in WIL to disseminate research findings and share knowledge to the benefit of institutions, students, WIL practitioners, curricular designers, and researchers. The Journal encourages quality research and explorative critical discussion that leads to the advancement of quality practices, development of further understanding of WIL, and promote further research.

The Journal is financially supported by the Work-Integrated Learning New Zealand (WILNZ; www.wilnz.nz), and the University of Waikato, New Zealand, and receives periodic sponsorship from the Australian Collaborative Education Network (ACEN), University of Waterloo, and the World Association of Cooperative Education (WACE).

Types of Manuscripts Sought by the Journal

Types of manuscripts sought by IJWIL is of two forms: 1) *research publications* describing research into aspects of work-integrated learning and, 2) *topical discussion* articles that review relevant literature and provide critical explorative discussion around a topical issue. The journal will, on occasions, consider good practice submissions.

Research publications should contain; an introduction that describes relevant literature and sets the context of the inquiry. A detailed description and justification for the methodology employed. A description of the research findings - tabulated as appropriate, a discussion of the importance of the findings including their significance to current established literature, implications for practitioners and researchers, whilst remaining mindful of the limitations of the data, and a conclusion preferably including suggestions for further research.

Topical discussion articles should contain a clear statement of the topic or issue under discussion, reference to relevant literature, critical and scholarly discussion on the importance of the issues, critical insights to how to advance the issue further, and implications for other researchers and practitioners.

Good practice and program description papers. On occasions, the Journal seeks manuscripts describing a practice of WIL as an example of good practice, however, only if it presents a particularly unique or innovative practice or was situated in an unusual context. There must be a clear contribution of new knowledge to the established literature. Manuscripts describing what is essentially 'typical', 'common' or 'known' practices will be encouraged to rewrite the focus of the manuscript to a significant educational issue or will be encouraged to publish their work via another avenue that seeks such content.

By negotiation with the Editor-in-Chief, the Journal also accepts a small number of *Book Reviews* of relevant and recently published books.

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