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ENHANCING WORK-READINESS AND EMPLOYABILITY OF AGRICULTURAL GRADUATES THROUGH A WORK-INTEGRATED LEARNING PROGRAM

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Abstract: Amidst a rapidly changing global agricultural landscape, a different set of knowledge, skills and attitudes is demanded by new entrants into the agricultural value chain. Such a changing landscape presents opportunities for universities to innovatively improve their products, processes, and systems. In this context, this paper presents one such innovation and focuses on the structure and content of a work-integrated experiential learning (WIL) component in the Agricultural Management curriculum offered by the Nelson Mandela University. Quality assessment feedback of students who completed a WIL program were analysed. The objective was to assess the program at two levels:1) the process level (the program design and delivery), as well as 2) the content level (improvement in managerial skills of graduates and the extent to which the Critical Cross-field outcomes (CCFOs) of the South African Qualifications Authority (SAQA) were addressed). Quality assessment questionnaires containing both structured and open-ended questions from different student year-groups over four consecutive years were analysed. The analysis dealt with responses (n=65) to structured Likert-type questions, supported with narratives from open-ended questions. At the process level the design and delivery of the program was rated fairly high (mean scores > scale mid-point). At the content level, the top four management skills that students perceived as having improved were teamwork, information management, decision making and cross-functional integration (> 95% rated sufficiently and above). All of the CCFOs can be achieved through the WIL program (> 78% rated sufficiently and above). The study makes a unique contribution towards emphasising how the elements of adequate design, content and execution of a WIL program can be integrated purposefully to enhance work-readiness and employability of agricultural graduates.

Keywords: work-integrated learning, employability, work-readiness, agricultural management

Introduction

New sets of knowledge, skills and attitudes are increasingly demanded from those involved in the value chain of the modern agricultural sector. Trends such as changing consumer demands, environmental pressures, changing geo-political and trade relationships, new technologies and the onset of the 4th industrial revolution, amongst many others, are shaping the global agricultural landscape (Calicioglu, 2019, Grama and Bartina, 2024). This is particularly relevant for the Higher Education sector who needs to play its role in developing a new generation of graduates who can engage innovatively within this changing agricultural context (Forum for Agricultural Research in Africa (FARA), 2006). Universities are however often criticized for being overly academic, dis-engaged from industry and producing graduates who find it difficult to secure meaningful employment due to a mismatch between industry expectations and graduate attributes (Jackson and Chapman, 2012, Cavanagh, 2015, Sephokgole *et al.*, 2021, Parrella *et al.*, 2023). The challenge for universities is to be aware of emerging trends and to improve their academic products, processes, and systems through constant innovation. In this context, this paper presents one such innovation to

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improve the employability of Agricultural Management students. The paper focuses on the design and delivery of a work-integrated experiential learning (WIL) programme as part of the curriculum of the Agricultural Management Diploma offered at the George Campus of the Nelson Mandela University in South Africa. A brief background and literature review on experiential learning and WIL is presented first in the context of enhancing work-readiness and employability. A description of the WIL programme in Agricultural Management is provided next, followed by the methodology used to evaluate to what extent the WIL programme is adequate to enhance work-readiness and employability. Finally, results are presented in terms of the design and delivery of the program, the development of managerial skills by students and in terms of attaining the Critical Cross-field Outcomes (CCFOs) as stated by the South African Qualifications Authority (SAQA)). The paper concludes with a summary of the results.

In agriculture, entrepreneurial and business management competencies are increasingly being recognized as important attributes in the workplace (FAO, 2011). Studies in Europe (McElwee, 2006, Hill, 2007, Bergevoet and Van Woerkum, 2006), New Zealand (Nuthall, 2006) and in the USA (Boland and Akridge, 2004, Parrella *et al.*, 2023), amongst others, concluded that competencies such as interpersonal communication, the ability to influence, critical thinking, and business management and marketing skills need to be incorporated in undergraduate agricultural courses, in addition to agricultural discipline-specific content. Hellriegel *et al.* (2001) refer to six managerial competencies: communication, planning and administration, teamwork, strategic action, global awareness and self-management. Smith and Morse (2005) add functional competencies (such as finance and marketing) and organizational competencies (such as organizing, leadership and motivation). The challenges of modern-day business also require more cross-functional operation and the ability to integrate (Piercy, 2013). All the above serve as indicators of important attributes which agricultural graduates need to develop in order to be employable.

From the body of literature, a distinction is made between the concepts of employability and work-readiness. Work-readiness broadly refers to the achievement of the expected learning outcomes and the possession of knowledge, skills and attributes associated with a particular academic qualification that is required for a specific role in industry (Bridgstock, 2009). As graduates move from the university into industry employment, they are required to translate their learned skills into competencies relevant to their role (Orr *et al.,* 2023). Work-readiness therefore demonstrates proficiency at the exit stage of university education and entry stage of employment. Employability, on the other hand, is seen as more than the possession of particular knowledge, skills and attributes related to a specific academic qualification or occupation – it refers to developing and possessing a set of additional generic skills and competencies that can be applied in different contexts and across different industries or occupations (Clarke, 2017, Deloitte Access Economics, 2017, Römgens *et al.*, 2020). The World Economic Forum (WEF) (2023) recently published a list of essential skills that employers across different industries expect from graduates: analytical and critical thinking for complex problem solving; resilience, flexibility and agility; motivation and self-awareness; curiosity and lifelong learning; dependability and attention to detail; technological literacy; empathy; leadership and social influence. These "non-technical skills" or "soft skills" are seen as important in the modern workplace, in addition to traditional technical or "disciplinary/hard skills" associated with particular industries or sectors. It has been argued that in order for graduates to be more employable, they need to develop both hard skills and soft/transferable skills (Clarke 2017), the latter including skills such as

communication, teamwork, problem solving, critical and innovative thinking, creativity, self-confidence, ethical understanding, capacity of lifelong learning, the ability to cope with uncertainty, as well as the willingness to accept responsibility (Harvey, 2000, Andrews and Higson, 2008, Clarke, 2017, Succi and Canovi, 2020). There is an increasing expectation from industry worldwide that educational institutions need to take responsibility for developing graduate employability (Tomlinson, 2012, Griffiths *et al.*, 2018, Cotronei-Baird, 2020, Succi and Canovi, 2020, Healy *et al.*, 2022). What is unclear, however, is how to sufficiently develop employability at agricultural graduate level and whether a "one-size-fits-all" approach can be used across disciplines.

Within the South African context, the South African Qualifications Authority (SAQA 2000) calls for the holistic development of learners to demonstrate certain life skills, which will not only enhance their learning, but will also ensure the application of these skills in their daily lives. The SAQA policy refers to these transferable skills as critical cross-field outcomes (CCFOs). The CCFO's that need to inform all teaching and learning across all qualifications are listed below :

- Identify and solve problems by way of critical and creative thinking.
- Work effectively with others as a member of a team, group or community.
- Organise and manage oneself and one's activities responsibly and effectively.
- Collect, analyse, organise and critically evaluate information.
- Communicate effectively (written/oral) using visual, mathematical and/or language skills.
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

Worldwide, many initiatives have been taken to develop the work-readiness and employability of students, including WIL programmes that has been integrated into the curricula of various academic qualifications (Tomlinson, 2010, Smith, 2012, Jackson, 2015, Rowe and Zegwaard, 2017). WIL is regarded as an umbrella term that represents many forms of experiential learning, such a classroom-based practical work, laboratory practicals, simulations, internships, placements in industry and more (The Higher Education Quality Framework of South Africa, 2013). The emphasis is on learning derived from experience. Experiential learning theory can largely be attributed to the early work of Dewey (1938), Lewin (1951) and Kolb (1984). Kolb's experiential learning theory is generally regarded as one of the most known theories in education and is widely acknowledged in pedagogical models (Chavan, 2011). Various studies report the benefits associated with experiential learning, including reflective learning, (Benecke and Bezuidenhout, 2011), developing critical thinking skills, greater self-belief (Stanley, 2005), improved academic performance (English and Koeppen, 1993), understanding integration and interrelationships in management (Holman, 2000, Piercy and Caldwell, 2011), making better links between theory and practice (Garavan and Murphy, 2001), learning through hands-on experience (Rupande and Bukaliya, 2013, Elijido-Ten and Kloot, 2015) and developing relevant workplace skills (Heerde and Murphy, 2009, Smith *et al.*, 2014, Reinhard *et al.*, 2016). For the purpose of this study, WIL is regarded as a period of employment as part of a tertiary education program (Smith, 2012, Elijido-Ten and Kloot, 2015). It is an educational approach that aims to give opportunities to students to practice professional or disciplinary skills, to apply

theoretical knowledge to real problems or to experience the world of work as part of a structured and purposefully designed curriculum (Patrick *et al.*, 2009). WIL assumes that the experience gained in the real-life context of work plays an important role in learning (Renganathan *et al.*, 2012) and for development of graduate attributes required by a profession (Smith *et al.*, 2014, Reinhard *et al.*, 2016, Rowe and Zegwaard, 2017). Although governments, industry, community and education institutions acknowledge the value of WIL as a mechanism for developing the employability of students (Chavan, 2011, Jackson *et al.*, 2013, Smith *et al.*, 2014, Bridgstock and Jackson, 2019), limited information is available on developing employability of agricultural graduates.

The main points emanating from the brief literature review are firstly, that new sets of knowledge, skills and attitudes are increasingly demanded from graduates in order to be work-ready; secondly, that a range of additional generic transferable skills are required to ensure graduates are employable; and lastly, that although WIL is perceived across many disciplines as a mechanism to develop work-readiness and employability of graduates, limited information is available in the agricultural domain.

Description of the Agricultural Management WIL programme

The 3-year Diploma in Agricultural Management offered at the Nelson Mandela University has a compulsory WIL period integrated into the curriculum. Students need to register for the WIL programme and submit assignments to gain the required academic credits. The programme extends over 2 semesters (12 months), spanning the last semester of the second study year and the first semester of the third study year. Students need to find an industry placement (preferably a farm) related to their major field of study. The students all major in Agricultural Management and one elective, either Plant Production or Animal Production, with various other complimentary agri-science and agri-business modules. Students need to find their own placements - this includes all negotiations in terms of their work program, remuneration and subsistence. Where students find it difficult to secure placements, academic staff will assist by making available contact details of potential employers. During the semester that precedes WIL, training is provided to assist students to prepare for the WIL period, e.g. training on how to compile a *curriculum vitae*, on basic interviewing skills, workplace ethics and general conduct in the workplace. An official letter from the university is provided to students to assist them with finding a placement, explaining to a prospective employer the basic requirements for experiential learning.

At the start of the WIL semester, each student receives a logbook to record all activities they are involved in. The purpose of the logbook is four-fold: firstly, to record their activities and any useful technical and management information they can gather relating to the activities; secondly to present the logbook on a weekly basis to the employer/mentor for them to verify and certify that the student complied with the work program of the week. This also creates an opportunity for open communication since it forces both the student and the employer to meet and to discuss possible matters of concern. Thirdly, the activities in the logbook need to be summarized and coded by the student on a monthly basis to encourage reflection on their learning experience. Fourthly, the signed logbook serves as evidence that a student has completed a 12-month WIL programme. All the requirements for the experiential learning and the schedule for submitting assignments are outlined in a manual that is provided to each student. The process is depicted in Figure 1.

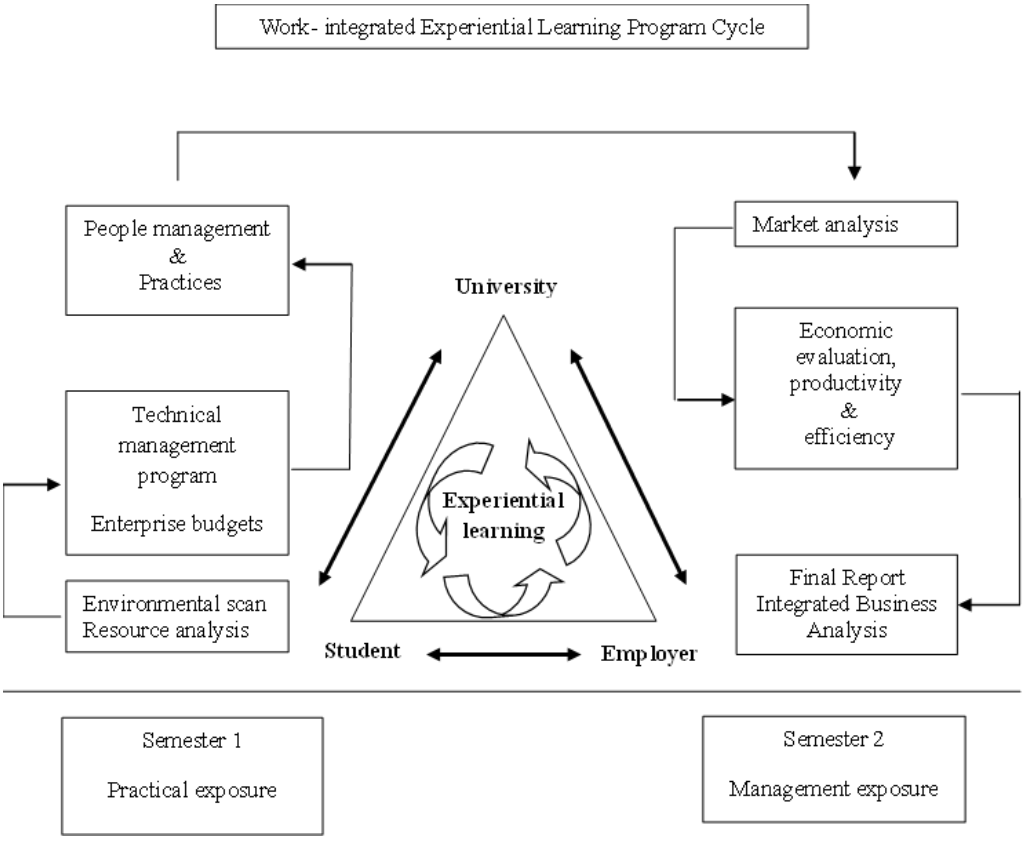

Figure 1: WIL program for Agricultural Management (Jordaan & Taylor, 2014)

The requirement for the first semester of experiential learning is to get broad exposure to industry through hands-on experience. To facilitate learning, students need to submit 3 assignments to the university during this first semester. The second semester requires a higher order of learning and a progression towards getting managerial experience. Because this transition is usually difficult, another 2 assignments are scheduled on topics that forces the student to make the transition towards management learning.

Some important features of the WIL programme need to be highlighted: apart from practical and hands-on experience, assignments are scaffolded in such a way as to facilitate learning while doing. During the first semester of practical exposure, the first assignment deals with a broad business environmental scan and resource analysis to get the student to assess the nature of the business. The second assignment requires the drafting of a technical management plan which is to be followed up with a financial plan/enterprise budget. The third assignment requires an assessment of people management practices on the farm, as well as a reflection on their own skills in terms of managing people on different levels (sub-ordinates, peers and management). This concludes the first semester and provides a basis for progressing towards more managerial learning. The fourth assignment is about market management and followed up with assignment 5, which deals with an economic analysis of the farm and possible future strategies. All the assignments are subject to formative assessment. The last assignment is a complete integrated Business Analysis report, drawing from all the previous 5 assignments. This assignment, together with an oral presentation is subjected to a final summative assessment. A minimum pass mark of 50% for each is required to obtain the required credits.

Methodology

Quality assessment questionnaires that contain both structured and open-ended questions are annually distributed to students who complete the WIL programme. From a usual cohort of between 30 – 40 students annually doing the WIL programme, around 50% will complete the questionnaire voluntarily and anonymously. The student feedback is part of an ongoing broader quality assessment programme in the Department of Agricultural Management. This study attempted to analyse the quality assessment feedback from students across the past four years, 2020/2021 – 2023/2024. The analysis dealt with responses to structured 5-point Likert-type questions (1 = poor; 5 = excellent), supported with narratives from open-ended questions. To evaluate to what extent the WIL programme is adequate to enhance work-readiness and employability, firstly the design and delivery of the program (the *process*) was analysed, followed by an analysis relating to managerial skills development and attaining the Critical Cross-field Outcomes (CCFOs) (the *content*). Responses from a total of 65 students across the different year groups were analysed. No sophisticated statistical analyses were done. The focus was rather on exploring the feedback from students about their WIL experiences and whether enhanced work-readiness and employability can be assumed, in addition to identifying areas for improvement in the quality of the current program.

Results and discussion

The demographics of the respondents are presented in Table 1.

Table 1: Demographic information of respondents (2020 - 2024)

Item	%
Gender:	
Male	45%
Female	55%
Age (years):	
< 20	5%
20 – 22	54%
23 – 25	31%
25 +	11%
Home language:	
English	2%
Afrikaans	12%
isiXhosa	69%
isiZulu	8%
Other	9%
Farm background	12%
No farm background	88%

The majority of respondents were female students (55%), which is in line with the gender representation of students registered for the qualification. The majority of the respondents are in the age group 20-22 years. On average, 88% of respondents had no prior agricultural or farming background (nor were their parents involved in agriculture). This is in line with an emerging trend observed for new applicants for Agricultural Management studies at the George campus of the Nelson

Mandela University. The 12% who indicated prior farming/agricultural background, mostly grew up on commercial farms. In terms of language the respondents are quite diverse, with English (the language of tuition) the home language of only 2% of the respondents and the rest a mix of indigenous South African languages, mainly isiXhosa, isiZulu and Afrikaans. All respondents can however converse in English.

In terms of the design and delivery of the WIL programme, results are presented in Figure 2. Respondents rated the design and delivery of the program fairly high, with mean scores of all the Likert-type questions above the scale mid-point of 3 across all the years. Students felt they were adequately prepared for the WIL program from an academic perspective. Emotionally however, they indicated only sufficient preparation (with some students indicating complete under-preparedness). This may be due to the high proportion of students with no farming/agriculture background enrolling for agricultural studies. These students generally are unfamiliar with the demanding nature and harsh reality of farming. This is a real challenge for students and could be mitigated through a more focussed recruitment and admissions policy and linked with a mentorship program offered by senior students before the onset of WIL.

The inclusion of scheduled assignments was seen as necessary interventions and part of the structured program, in line with the view of Patrick *et al.* (2009) that theory need to be integrated with the practice of work by way of a structured and purposefully designed curriculum. The specific sequence and scaffolding of assignments were seen as helping to facilitate progression towards management learning, despite students reporting the projects as taxing on their time. Students were positive about the use of a logbook for assisting in the collection, organizing and evaluation of information. They also perceive the logbook as valuable in helping them to reflect on their learning. Both the Final Report at the end of the WIL program, and the Final Presentation (to a lesser degree), were seen as valuable components in the structure and design of the program, helping them to integrate the many aspects they learned. This conforms to the view by Piercy and Caldwell (2011) that WIL helps students understand integration and interrelationships in management. The administration of the program was seen as sufficient, although some students listed a lack of communication and insufficient feedback as main concerns.

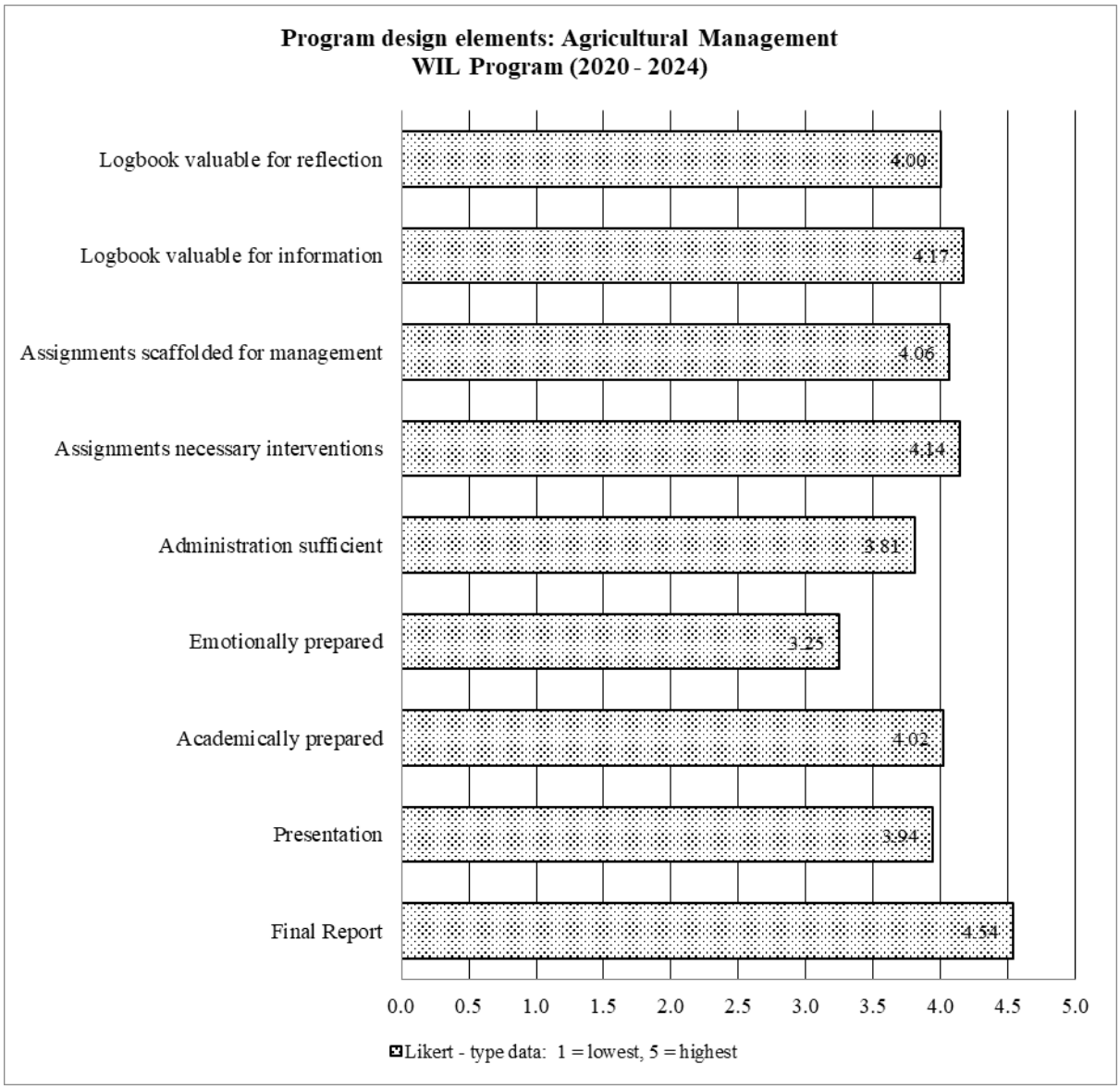

Figure 2: Results of quality assessment survey on design of Agricultural Management WIL program

A closer look at how students rate the usefulness of the scaffolded assignments reveals that most of the assignments were regarded as useful in the learning process. This seems to be consistent with the notion that experiential learning helps in linking theory with practice (Garavan and Murphy, 2001, Rupande and Bukaliya, 2013). The mean score and rank for all the different assignments are given in Table 2. The Final Report ranks as number one in terms of usefulness with 92% of the respondents giving a rating on the scale of 4 or higher. This is followed by 88% of the respondents ranking the Environmental scan and Enterprise budget/Management plan equally on a scale of 4 or higher, with the Economic evaluation next with 86% respondents ranking it at a scale of 4 or higher.

Table 2: The mean score and rank for assignments included in the program

Projects	Mean	Rank	% sufficient (3) and higher	% above average (4) and higher
Environmental Scan	4.46	2	100%	88%
Enterprise budget/Management plan	4.46	2	100%	88%
People Management	4.14	6	97%	72%
Market Management	4.25	5	92%	80%
Economic evaluation	4.32	4	95%	86%
Final Report	4.54	1	95%	92%
Presentation	3.94	7	91%	72%

Mean score on Likert scale of 1 - 5; rank on mean scores

Despite the fairly high rankings, students do report the different assignments as challenging in terms of drawing information from the employers as well as for complying with deadlines of the university. These challenges are acknowledged, however is regarded as part of the learning process and needs to be mitigated by students themselves. Although the assignments may appear to be random projects, they are in fact purposefully scaffolded in such a way that it facilitates integration of information by the time the Final Report is to be produced. Consistent with Kolb's experiential learning theory, the WIL program seems to enable a more holistic learning, giving students the opportunity to engage in the entire learning cycle of experiencing, thinking, reflecting and acting (Kolb, 1984, Chavan, 2011).

In terms of the content of the WIL program, the student feedback on the improvement of their management related skills and knowledge in relation to the profession (work-readiness) was assessed first. Table 3 depicts the mean scores and rank of the different management related skills. The top 4 management skills that students perceived as having improved during their WIL program are teamwork (rated by 88% of students as above average improvement and higher), decision making skills (rated by 88% of students as above average improvement and higher), information management skills (rated by 83% of students as above average improvement and higher), and the ability to integrate business aspects (cross-functional) (rated by 85% of students as above average improvement and higher).

Table 3: The mean score and rank for managerial skills having improved during WIL

Management skills	Mean	Rank	% sufficient (3) and higher improvement	% above average (4) and higher improvement
Decision making	4.52	2	98%	88%
Information management	4.40	3	97%	83%
Teamwork	4.58	1	95%	88%
Communication	4.26	4	94%	83%
Integration (Report)	4.26	4	97%	85%
Integration (Presentation)	4.02	6	92%	74%
Planning	3.51	11	85%	46%
Organising	3.66	7	92%	55%
Lead	3.63	8	88%	60%
Control	3.58	10	88%	57%
People Management	3.63	8	85%	58%
Financial Management	2.98	12	63%	34%
Marketing Management	2.72	13	55%	26%

Mean score on Likert scale of 1 - 5; rank on mean scores

Together, this supports the notion that experiential learning is of benefit in developing relevant workplace skills (Heerde and Murphy, 2009), understanding the interrelationships in management (Holman, 2000) and developing managerial competencies (Hellriegel *et al.*, 2001, Boland and Akridge, 2004, Smith and Morse, 2005, Parrella *et al.*, 2023, Grama and Bătrîna, 2024). The managerial skills that were rated as the lowest in terms of improvement included Financial Management and Marketing Management (despite 55% - 63% of respondents reporting sufficient (scale 3) and higher improvement. For Marketing Management skills, this can be explained by the fact that Marketing Management is only offered as a module to students in the semester after completion of the WIL program. As for Financial Management skills, this is in line with casual observations over a number of years that employers tend to treat financial information as confidential and consequently students are not as involved in the financial matters of the business as what should be the case.

A further aspect to consider in relation to the content of the WIL program is the extent to which employability can be enhanced by embedding the generic transferrable CCFOs in the WIL program. Figure 3 depicts the means for Likert-type questions in relation to attaining the CCFOs.

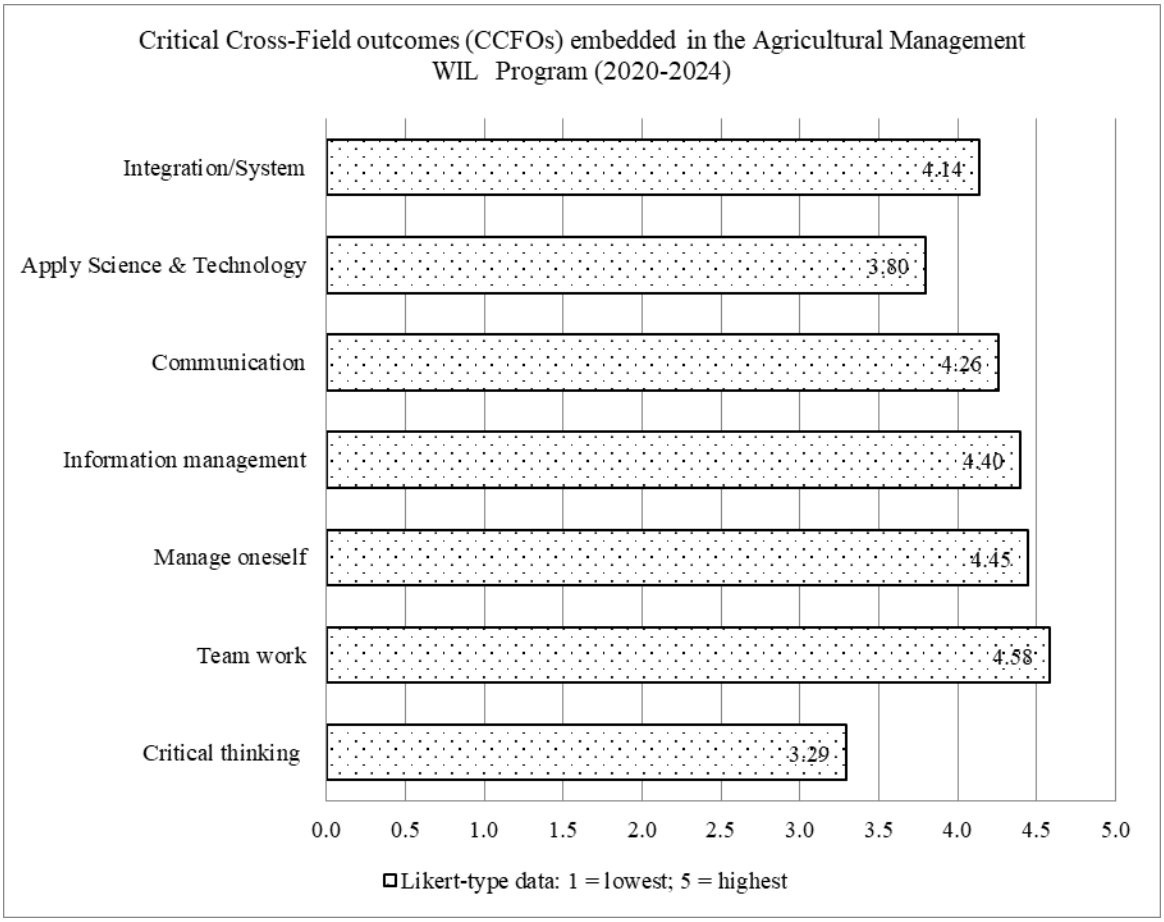

Figure 3. Attainment of Critical Cross-field Outcomes for the Agricultural Management WIL program

Feedback suggests that all of the CCFOs can be achieved through the WIL program. Mean scores are all above the scale mid-point of 3. Despite all respondents reporting the need to have employed critical thinking in solving problems, this CCFO has the lowest mean score over 4 years (3.29), with only 55% of students reporting that their problem-solving required critical or creative thinking. This could be an indication of the level at which students operate in the workplace, where "interns" are mainly allowed to make routine operational decisions and have limited scope for applying critical thinking and problem-solving at a higher level.

In general, Agricultural Management students perceived the WIL programme as a necessary component of their studies. Despite some challenges, all the respondents agreed that WIL should be retained as part of the formal academic qualification in Agricultural Management since it adds value to their learning. A sobering revelation is that quite a number of students accepted own responsibility for making the WIL program successful for themselves. On the requirements for success, students mention aspects such as "hard work", "commitment", "willingness to learn" "an enquiring mind" and "correct mindset". What students require from the workplace include aspects such as "willing and able mentors", "information sharing" and an "uplifting work environment". What students require from the university includes mainly timeous feedback on assignments, the establishment of a database of accredited employers and better communication with prospective employers –issues that were reported in earlier studies (Benecke and Bezuidenhout, 2011) and that can all be addressed fairly

easily. Since WIL assumes a partnership between the university, the student and the employer, it implies a need for constant interaction between the three parties.

Conclusion

Universities have an important role to play in ensuring that students develop the required knowledge, practical skills and professional attributes for their profession and for life. Through WIL, agricultural students are engaged in a work setting under supervision of current managers and so supplement their teaching and learning offered by university academics. The value of WIL programs cited in previous research is supported by findings of this study with regard to the development of academic and professional competencies of Agricultural Management students. Findings reveal that the WIL program is adequately designed and implemented for enhancing experiential learning as well as for contributing to embedding the SAQA critical cross-field outcomes in teaching and learning. The WIL program seems to facilitate a more holistic learning, providing students with an opportunity to engage the entire learning cycle of experiencing, thinking, reflecting and acting. Overall the findings support WIL as a useful and necessary program for enhancing employability and support the inclusion thereof in an Agricultural Management qualification to enhance work-readiness and employability of graduates. For educational institutions offering Agricultural Management qualifications, the inclusion of a structured WIL component may be beneficial in terms of curriculum enhancement. The obvious limitation of the study relates to the small sample of students, the case specificity of the survey and the exclusion of employers' feedback from the study. Results should therefore be interpreted in this context. Future research would benefit from the inclusion of employers' perspectives and also a longitudinal analysis of the impact of WIL on work-readiness and employability. Despite the limitations, the study confirms previously documented benefits of WIL and albeit only from the students' perspectives, provides important confirmation on adequate design, content and execution of the program for enhancing work-readiness and employability, as well as providing information that should aid in improving the program.

Declaration of Interest Statement

The authors declare that they have no conflict of interests.

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