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The Contribution of Work-Integrated Learning to Nutrition Undergraduate Employability Skill Development

Hannah Ferguson[1], Michelle Ho[1], and Tanya Lawlis[1]

Corresponding author: Tanya Lawlis (Tanya.Lawlis@canberra.edu.au)
[1] Department Discipline of Nutrition and Dietetics, University of Canberra, Canberra, Australia

Abstract

The field of nutrition has seen a growing interest and demand in recent years, with more students choosing to study within the field. This demand has highlighted the importance of producing work-ready graduates with skills that enhance their employability and ability to contribute effectively to the workforce. This study investigated the role of work-integrated learning (WIL) on improving employability skills in nutrition undergraduates (n=41) at an Australian university. Perceived skill development was determined using the Employability Skills Cluster Matrix-Self Assessment Tool (ESCM-SAT). Significant improvements were observed across all 24 employability skills post-internship, with the greatest increase in the communication cluster and 'developing and managing my career' ($p<0.01$). Skill development was attributed to self-awareness, exposure to a professional environment, and mentorship. Undergraduate nutrition degrees should consider strategies to develop transferable skills and include WIL for the unique application of academic knowledge to diverse workplace settings within the industry.

Keywords
Work-integrated learning, employability, skills, undergraduate, nutrition

Introduction

The field of nutrition has gained considerable interest and growth in recent years, largely attributed to the increasing awareness of nutrition's role in population health and emerging areas in sustainability, media, retail and education (Gaba et al., 2015; Murray et al., 2020; Oluwatosin and Ogundero, 2021; Shyam and Smith, 2018). As a result, there has been increased demand for the nutrition workforce to be equipped with appropriate professional skills to adapt to the rapidly growing field (Bawadi et al., 2019). Recent comparable studies in science and allied health have reported a mismatch between the skills of job applicants to those required by employers, with emphasis on possessing fundamental discipline-specific knowledge as well as transferable skills due to the changing nature of work in the field of health (Freudenberg et al., 2011; Sambell et al., 2020; Sarkar et al., 2016; Williamson et al., 2020). While, there is limited literature focusing specifically on nutrition undergraduate employability, interest in this area is increasing (Murray et al., 2020). In Australia, nutrition graduates typically complete 3-years of undergraduate study. Unlike dietetics courses, there is no requirement for Australian undergraduate nutrition programs to be accredited and competencies are not mandated (Lawlis et al., 2019, Barber et al., 2022), thus contributing to the

diversity of graduate knowledge and skills and varying opportunities to develop the specific skillset that employers seek.

In the discipline of nutrition, employers and professionals view technical (hard) and transferable (soft) skills to be crucial for nutrition graduates. Discipline-specific technical skills include knowledge of nutritional science, public health nutrition, and the food environment, whereas transferable skills refer to communication, leadership, management, teamwork, critical thinking, interpersonal skills, and advocacy (Murray et al., 2020; Oluwatosin and Ogundero, 2021; Sambell et al., 2020). The development of both technical and transferable skills is crucial to increasing student employability and capability to address current and emerging nutrition challenges. Technical skills are typically developed within the university or classroom setting, and limited focus is placed on the development of transferable skills as workplace experience and opportunities are often optional and may have lower levels of student engagement (Murray et al., 2020, Barber et al., 2022). In recent years, employers have prioritised highly developed transferable skills over technical skills when seeking new graduates (Sambell, et al, 2021) and according to Australian employers, health graduates are lacking in essential soft communication skills such as written, oral, and active listening (Sambell et al 2021, Deloitte Access Economics, 2017). Similarly, Barber (2023) and Croxford (2022) recommended the embedding of additional professional skill development and work integrated learning (WIL) within the nutrition undergraduate curriculum would highly benefit nutrition graduates. These calls are despite most Australian universities embedding graduate attribute statements (or generic still statements) that refer to the transferable, non-discipline specific skills or capabilities that students will achieve upon course completion within their curriculum design (Hammer et al., 2021; Tertiary Education Quality and Standards Agency (TEQSA), 2022). For the most part though, students would be unaware of how the graduate attributes map to their actual capabilities and stage of learning, or professional expectations of a new graduate. With graduate employability being an important measure of the value of a university's education, greater emphasis is placed upon higher education institutions to provide students with diverse and authentic opportunities to develop both technical and transferable skills. In doing so, higher education institutions will provide work-ready nutrition graduates and minimise the disjoint between employer expectations and graduate skills (Sambell et al., 2020; Williamson et al., 2020).

WIL in higher education is a key strategy to reducing the gap between employer expectations and graduate skill level (Smith et al., 2018). WIL broadly refers to opportunities whereby students integrate, build upon, and translate knowledge gained in the classroom to a workplace setting. These programs include placements/internships, and service learning (Jackson, 2013), that provide opportunities for students to develop and build on transferable skills, create network links, build confidence, and engage in the workforce, integrating their learning to different contexts and enhancing skills desired by future employers (Jackson, 2013; Maher et al., 2015; Murray et al., 2020; Sambell et al., 2020; Williamson et al., 2020; Croxford, et al., 2022). WIL can either be a small component within a unit of study or a single unit whereby students undertake work-related activities relevant to their chosen course within an host organisation. The critical importance of WIL programs integrated within undergraduate degrees for the student, university, and industry cannot be underestimated (Sarkar et al., 2016).

Traditionally, formal WIL opportunities have not previously been available to students studying an undergraduate nutrition degree due to the absence of professional accreditation or formal competency requirements (Murray et al., 2020, Dietitians Australia, 2021). Nutrition curriculums have instead, primarily focused on teaching theory with traditional lectures and limited forms of authentic experience in classroom-based activities (Brown 2010; Sambell et al., 2010; Lawlis et al., 2019). The introduction or embedding of WIL in undergraduate nutrition degrees is relatively new, is not standardised nor mandated, with varying forms of WIL ranging from an add-on within a unit of study to a full unit (Barber et al., 2022, Murray et al., 2020). The lack of standardised or mandated WIL experiences as is seen in accredited dietetics programs, may limit the capacity of nutrition courses to fully develop the transferable skills and experiences relevant to the workforce to develop work-ready graduates (Lawlis et al., 2019; Murray et al., 2020).

Improving graduate employability outcomes is a priority for higher education institutions. WIL is seen as one way to better prepare students for the workplace and develop work-based skills. Despite studies reporting development in certain skills following WIL, there have been inconsistencies between fields of study, with some disciplines stating minimal skill improvements (Jackson, 2013; Murray et al., 2020), or in the case of allied health (Williamson et al., 2020), the impact of WIL specifically for nutrition is not well understood. This study assessed self-perceived employability skill development in undergraduate nutrition students participating in a WIL internship. The findings will provide insight into how to expand future nutrition workforce capabilities by shaping undergraduate degrees to best support the development of work-ready nutrition graduates.

Methods

Study design and recruitment

Third-year undergraduate nutrition students who were enrolled in the unit Industry and Community Engagement (Health) (10120) and completed a 120-hour internship from Semester 1 2020 to Winter Term 2021, participated in the study. This unit has been classified within the Faculty as an internship unit for two reasons: the first, due to the short-term WIL opportunity offered within the unit; and secondly, to distinguish the WIL experience from the professional placements undertaken in our other professionally accredited health degree programs, such as the Master of Nutrition and Dietetics. The undergraduate nutrition degree at [removed for peer review] is not a professionally accredited degree program. Internships were unpaid, completed either full or part-time and undertaken at a variety of organisations including government, community, private practice, and the university. Activities included presentations, education sessions, literature reviews, nutrition resource development, and running food literacy sessions. As some of the internships were impacted by COVID-19, changes to internship activities included greater emphasis on research and online presentations, but not all were conducted virtually or remotely. As part of their assessment, students were required to complete a pre- and post-Employability Skills Cluster Matrix-Self Assessment Tool (ESCM-SAT) (Sambell and Moore, 2017) as part of their assessment. Before completing the ESCM-SAT, students were advised of the study, impact, potential risks, and asked for their permission to use their completed ESCM-SAT assessment in the study. Participant information and consent forms were attached to the pre-ESCM-SAT, which was completed and submitted by students at the same time the assessment was due. To assess change in employability skill development, students completed the pre-ESCM-SAT in week one and the post-ESCM-SAT the last week of semester. In addition, students were asked to provide demographic data: age range, gender, completion of prior studies and whether they worked, took a gap year or completed year 12 prior attending university. This study has been approved by the University of Canberra Human Research Ethics Committee (HREC-1488 and HREC-2053).

At the time of the project, the research team comprised two Master of Nutrition and Dietetics students (HF and MH) and the convener of the unit Industry and Community Engagement (Health) (10120) with qualitative research expertise (TL). Both HF and MH conducted the data analysis as part of a Master of Nutrition and Dietetics research unit and were mentored by TL. Prior to undertaking the analysis, the student responses from the submitted ESCM-SAT were transferred to an excel document by a research assistant with student names and identifiers removed to maintain confidentiality. All analysis was conducted on the de-identified data.

Employability Skills Cluster Matrix-Self Assessment Tool (ESCM-SAT)

The ESCM-SAT comprises five skill clusters: communication, interpersonal, career management, self-management, and academic, each consisting of three to six employability skills (total 24 skills) (Sambell and Moore, 2017). Development and piloting of the ESCM-SAT has previously been conducted by Edith Cowan University (Sambell et al., 2020; Sambell and Moore, 2017). Table 1 lists the skills under each cluster. At each time point (pre- and post-internship) students rated themselves against each of the 24 skills using a five-point Likert scale, where one is a low and five is a high perceived skill level. For

the pre-ESCM-SAT students also stated how they would improve in each skill, then in the post-ESCM-SAT the students were asked to document how they demonstrated skill development over the teaching period.

Table 1: Employability Skills Cluster Matrix-Self Assessment Tool Clusters and Employability Skills (Sambell and Moore, 2017).

Cluster	Employability skills
Communication skills	written, oral, listening, clarity, information literacy and digital communication
Interpersonal skills	emotional intelligence 1 (own) and emotional intelligence 2 (others), collaboration, teamwork, leadership and conflict management
Career management skills	understanding and developing self, exploring life learning and work, and developing and managing my career
Self-management skills	planning and organising, initiative and adaptability
Academic skills	research, critical thinking, problem solving, reflection, commercial awareness and linking learning to employability

Data Analysis

Quantitative data was imported into IBM SPSS (Version 23.0) statistical management system for analysis. Average Likert scale values were summed from each skill for the five clusters and total ESCM-SAT scores were summed. Normality of data was checked by producing histograms for the pre-and post-values of each skill, cluster, and total values for the ESCM-SAT (n=60). A majority of the plots were asymmetrical (n=56, 93%). Due to the non-parametric nature and related samples, Wilcoxon signed-rank tests (Scheff, 2016) were used to determine perceived skill development of the same group over two time points - at the beginning and end of the internship. Significance was achieved if $p < 0.05$.

Thematic analysis as documented by Braun and Clarke (2006) was undertaken to identify the key themes and sub-themes of the student's reflections on skill development documented in the post-ESCM-SAT. Themes were developed by identifying recurring ideas and topics across all 24 employability skills. Sub-themes were identified if they occurred at least five times by different students throughout the employability skills. The thematic analysis process was conducted manually, using Microsoft Word. The transcripts were read line-by-line and by question with codes applied. Themes and sub-themes were then defined and categorised by (removed for peer review) and reviewed by (removed for peer review). Where themes and sub-themes differed the authors consulted to arrive at consensus until all authors agreed on the themes and sub-themes.

Results

Descriptive Statistics

Of the 41 participants, 88% were female (n=36), the majority were 20-24 years (83%, n=34) and 93% (n=38) were in their third or fourth year of study (Table 2). Half of the participants commenced university the year after completing year 12 (50%, n=20).

Table 2: Frequency and Percentage of Demographic Characteristics (n=41)

	Frequency(n=41)	Percentage (%)
Age range (years)		
17-24	34	83
25-29	4	10
30+	3	7
Gender		
Male	5	12
Female	36	88
Degree		
Bachelor Human Nutrition/Bachelor Health Science	31	75
Bachelor Sport & Exercise Science/Bachelor Human Nutrition	8	20
Bachelor Health Science (Human Movement)/Bachelor Human Nutrition	2	5
Year of course		
First year	1	2
Second year	2	5
Third year	27	66
Fourth year	11	27
Prior Activity*		
Completed year 12	20	50
Took a gap year or worked ≥ 1 year	20	50
Prior Study		
Yes	11	27
No	30	73

*Only 40 responses were recorded

Data Analysis - Difference in ESCM-SAT Scores

Significant differences to the positive were reported in all 24 employability skills ($p < 0.05$). A significant difference in total ESCM-SAT scores between pre- and post-responses (median total score = +14 ± 15, p< 0.001, Z = -5.58) was identified. Table 3 shows the perceived increase in employability skill development organised by clusters: communication (p <0.001, Z = -5.58), interpersonal (p <0.001, Z = -5.26), self-management (p <0.001, Z = -5.37), career management (p <0.005, Z = -5.23) and academic skills (p <0.005, Z = -5.27). Of the individual skills, the greatest Z-score was observed in 'developing and managing my career' and lowest in 'emotional intelligence 1'.

Table 3: Change in Self-Reported Employability Skills Using the Employability Skills Cluster Matrix Self-Assessment Tool (ESCM-SAT) (n=41)

Cluster	Median (Pre)	IQR	Median (Post)	IQR	Significance	Z-score
Communication (/30)	**20**	**3**	**24**	**3**	**p<0.001**	**-5.579**
Written	3	1	4	0	p<0.001	-5.203
Oral	3	1	4	1	p<0.001	-4.998
Listening	4	0	4	1	p<0.001	-3.992
Clarity and concision	3	1	4	0	p<0.001	-4.766
Information literacy	4	1	4	1	p<0.001	-4.560
Digital literacy	3	2	4	1	p<0.001	-4.845
Interpersonal skills (/30)	**21**	**3**	**24**	**4**	**p<0.001**	**-5.256**
Emotional intelligence 1*	4	1	4	1	p=0.008	-2.668
Emotional intelligence 2*	4	1	4	1	p<0.001	-3.567
Collaboration	4	0	4	1	p<0.001	-3.545
Teamwork	4	0	4	1	p=0.003	-2.995
Leadership	3	1	4	1	p<0.001	-4.901
Conflict management	3	1	4	1	p<0.001	-4.264
Self-management skills (/15)	**9**	**3**	**11**	**3**	**p<0.001**	**-5.373**
Planning and organising	3	1	4	2	p<0.001	-4.066
Initiative	3	2	4	1	p<0.001	-4.564
Adaptability	3	2	4	1	p<0.001	-4.435
Career Management Skills (/15)	**9**	**3**	**12**	**2**	**p<0.005**	**-5.232**
Understanding and developing self	3	1	4	1	p<0.001	-4.916
Exploring life, learning and work	3	2	4	1	p<0.001	-4.745
Developing and managing my career	3	1	4	1	p<0.001	-5.251

Academic skills (/30)	**19**	**4**	**23**	**4**	**p<0.005**	**-5.270**
Research	3	1	4	0	p<0.001	-5.038
Critical thinking	3	0	4	1	p<0.001	-4.803
Problem solving	3	1	4	1	p<0.001	-3.780
Reflection	3	1	4	0	p<0.001	-4.691
Commercial awareness	3	1	3	2	p=0.001	-3.252
Linking learning to employability	3	1	4	1	p<0.001	-4.738
Total score (/120)	**79**	**15**	**93**	**15**	**p<0.001**	**-5.579**

IQR: Interquartile range.
*Emotional intelligence 1: identifying and managing your own emotions. Emotional intelligence 2: identifying the emotions of others.

Thematic Analysis - Themes in Student Critical Reflections

Eleven themes, with sub-themes, reflecting the student's perceived skill development were identified across the 24 skills. As shown in Table 4, the themes were not specific to an employability skill. Themes were spread, with 'mentoring from peers, supervisors and professionals' and 'exposure to professional environment and content' (n=17, 71% and n=19, 79% respectively) found across most employability skills. 'No change' in employability skills was identified across 22 skills. Students perceived their skill ability unchanged post-internship, or having no opportunity to develop the particular skill within the internship due to the lockdown and restrictions of the COVID-19 pandemic, for example: *"due to a number of external factors caused by COVID-19 which are currently effecting [sic] my job security I do feel very stressed and less able to manage my emotions*'' [Emotional intelligence skills 1, student 22].

Table 4: Themes Arising from Critical Reflections Provided by Student's Post-Internship.

Theme	Sub-Themes
Awareness of self and others (L, E1, E2, Co, T, CM, SD, DCa, P, CT, Re, C, Li)	• Increased confidence (O, Cl, DC,Ca, CT, PS, Li) • Voicing ideas and opinions (CM, O, E2, Co, T, CM, PS) • Emotional awareness (E2, CT) • Self-reflection (E1, Re)
Mentoring from peers, supervisors and professionals (W, O, L, Cl, Il, DC, E1, E2, Co, T, CM, SD, EL, I, CT, A, PS)	• Support (W, O, L, Cl, Co, SD, I, PS, Re) • Guidance (W, O, L, Cl, E1, SD, EL, A, CT, PS, Re, C) • Feedback (W, O, L, Cl, E1, E2, Co, T, Le, CM, SD, I, R, CT, Re, C, Li)
Exposure to professional environment and content (W, O, L, Cl, DC, E1, Co, T, Le, CM, SD, EL, DCa, P, I, A, PS, Re, C, Li)	• Networking E2, EL, DCa, P, I, CT, R, Li) • Exposure to diversity of nutrition workforce (E2 ,EL, DCa, P, I, A, P, Co) • Exposure to job/volunteering opportunities (SD, EL, DCa, P, I, Li) • Applying theoretical knowledge in a practical setting (Li)

Improved writing ability (W, Cl, DC, Le, DCa, R, Re, C, Li)	• Internship written tasks (W, O, Cl, IL, Le, DCa, A, R, CT, PS, Re, C) • Developing resources and deliverables (Cl, DC, IL, DCa, A, R, C) • Editing written material (W, Cl, A, Re, O, DC, Le)
Convey scientific information into lay terms (W, O, Cl, E2, Le, C)	• Paraphrasing and simplifying content (Cl, L) • Presentations (O, Cl)
Personal and professional organisation (E1, T, Le, EL, DCa, A, Li)	• Time management (W, E1, CD, SD, DCa, P, I, A, PS) • Planning and prioritising tasks (E1, P)
Collecting and critical analysis of research (W, IL, R, Cl, PS, IL)	• Summarising information (W, Cl, IL, DC, R) • Extensive research using search engines/databases and reliable resources (IL, DC, R, CT, PS, Li) • Finding solutions (E1, CM, CT, PS)
Effective collaboration in a team (W, O, L, CO, T, Li)	• Collaboration/discussion with peers and supervisors (O, L, Cl, E2, Co, T, SD, EL, A, CT) • Effective communication (Co, T, CM, CT) • Negotiating tasks (CM) • Flexibility/Adaptability (Co, T, SD, P, A, CT, PS)
Increased awareness and development of career pathway (Le, CM, DC, I, DCa, P, Li)	• Taking initiative (Le, CM, DC, I, A) • Developing career plan (EL, DCa, P, Li) • Seeking volunteering opportunities (DCa, I) • Leadership (Co, T, Le) • SWOT* analysis (SD, Re, C, Li)
Awareness of listening skills (L, Co E2, T, CM, DCa)	• Active listening (L, E2, CT) • Information retention (L) • Listen effectively to tasks and expectations (E2, CM, Co)
No change (W, O, L, Cl, Il, DC, E1, E2, Co, Le, CM, SD, EL, DCa, P, I, A, R, CT, Re, C, Li)	

W: written, O: oral, L: listening, Cl: clarity, IL: information literacy, DC: digital communication, E1: emotions 1, E2: emotions 2, Co: collaboration, T: teamwork, Le: leadership, CM: conflict management, SD: self-development, EL: explore life, DCa: develop career, P: planning, I: initiative, A: adaptability, R: research, CT: critical thinking, PS: problem solving, Re: reflection, C: commercial, Li: linking. *SWOT = (strengths, weaknesses, opportunities, and threats)

'Awareness of self and others', identified more commonly in the interpersonal cluster, was reported across 13 employability skills. Student confidence developed with participation in new tasks and environments, discussions with professionals, and conducting workshops and presentations. Students practiced self-reflection by reviewing areas where they progressed or needed improvement, particularly in the end of internship assessment. Working in teams, reading body language, and being exposed to different people and environments helped develop the student's emotional awareness. Through meetings, group discussions and collaboration with supervisors and professionals, students grew more confident in expressing their ideas and seeking help:

> *Identifying the emotions of others working within the internship allowed me to better understand when to ask for questions or help. Having a sense of understanding for the clients coming into the practice with a lack of education towards nutrition allowed me to help and understand their situation better* [Student 15, Emotions 2].

The theme 'Mentoring from peers, supervisors and professionals' was identified across 17 employability skills and is defined by self-reported improvement through guidance, support, and feedback. Peers provided support and guidance by reviewing academic work and providing constructive feedback. Supervisors and professionals provided students with mentoring, discipline-specific and work-related feedback, which students perceived key to their professional development.

'Exposure to professional style and content' was identified across 20 employability skills and involved students being exposed to different expectations and styles of the work environment. Students were able to build professional relationships, and gain insight into the diverse workplace settings and job opportunities within the nutrition industry. Application of academic knowledge in a real-world scenario encouraged practical experience and awareness of professional expectations, as explained below:

> *After my internship, I now have a better understanding of where I would like to head in terms of my career path. It was also beneficial to speak to other graduates and people in this industry to understand how I can further my career"* [Student 4, Explore Life].

'Improved writing ability' was reported by students across nine employability skills. Written tasks were varied and differed to traditional university assessments, which included developing organisational resources such as brochures, fact sheets, emails, and digital content (social media, website content), including e-portfolios required for university assessment. This exposed students to digital platforms not previously used (Microsoft, Acrobat, Mahara, Canva). Through real-life practice, use of various platforms for delivery and communication, and proofreading tasks, students further developed their abilities in producing written materials.

'Conveying scientific information into lay terms' was identified more commonly within the communication cluster, links to the above theme, and spanned across six employability skills. This theme describes the ability to paraphrase and simplify content, translating scientific and technical information into terms understood by individuals not in the specialised field. A skill that is not currently taught within the curriculum. Students developed their ability to paraphrase and simplify content by analysing literature, summarising the main themes, and restating and presenting this in their own words in a manner suitable for their audience.

Also linking to the above two themes, 'Collecting and critical analysis of research' was identified across six employability skills. Under this theme, students reportedly enhanced their research skills and ability to refine and summarise information in their internship by reviewing research, collecting key points, and expressing information in a succinct manner. Through their internship, students extended their existing research skills by using databases more effectively to conduct extensive research, find reliable resources, and gain a better understanding of the hierarchy of evidence-based literature. Finding solutions from research was enhanced by analysing options, alternative routes and the most suitable approach, analysing data, and conducting needs assessments.

The theme 'Personal organisation' was identified across seven employability skills and is defined by the student's perceived capability to organise themselves during the internship through time management, planning, and prioritising tasks. Strategies that encouraged improved skill development included creating deadlines and action plans, to complete work on time.

The theme, 'Effective collaboration in a team' was identified across six employability skills, more commonly in the communication cluster. Collaboration and/or discussion with others occurred throughout several employability skills, with development of these skills often encouraged through group assignments, meetings with peers, supervisors, and professionals, online communication methods, and presentations. Negotiating tasks occurred in group discussions by discussing goals,

finding compromises, and assigning roles to team members. Flexibility and adaptability in these settings was often associated with the student's ability to maintain an open mindset in group discussions, rearranging plans throughout internships due to disruptions such as COVID-19, problem solving, and modifying resources and presentations to suit changing circumstances.

'Increased awareness and development of career pathway', while identified across seven employability skills, was more commonly represented in the interpersonal and career management clusters. Students developed initiative by participating in additional activities, securing their own internship, and seeking further responsibilities and opportunities. Many students developed or altered career plans and goals after gaining insight into possible career paths through their internship and visiting career advisors. Some students conducted a SWOT (strengths, weaknesses, opportunities, and threats) analysis on organisations, gaining further insight into organisation values and comparing these with their own, for example:

> *...Reflecting on my experience after completing my internship has also helped me identify the skills and strengths I need to cultivate and the weaknesses and threats that I need to address and overcome to enable me working as a dietitian within an international context in the future* [Student 8, Commercial].

The final theme 'Awareness of listening skills' was identified across six employability skills. This theme was defined by the ability to reflect on listening skills and ideas of others through participation in meetings, conversations and consultations. Active listening was enhanced through remaining attentive, showing eye contact, and asking questions and feedback. Repeating information back to the supervisor, professionals, and patients consolidated information, while witing notes in discussions, consultations, and meetings developed students' information retention.

Discussion

This study examined the development of employability skills in undergraduate nutrition students who participated in a WIL internship. Employability skill development was assessed using the ESCM-SAT (Sambell and Moore, 2017). The mixed methods approach provided a panoramic view, identifying skill development using scale data and insights into the experiences that influenced skill development through student narratives. Each method emphasised different aspects of employability skills; quantitative identifying the scale of skill development, whereas qualitative was more explanative, making sense and defining the quantitative. Quantitative analysis showed a significant difference in all 24 employability skills after completion of an undergraduate nutrition internship. The qualitative data emphasised the perceived benefit of an internship and perceived gaps in the curriculum influencing the type and level of skill development, for example 'conveying scientific information into lay terms' and critical analysis of research are not extensively taught within the current undergraduate nutrition curriculum of which these students were enrolled. The overarching themes within student reflections indicate the development of transferable skills that are highly desirable by employers as they facilitate work-readiness of graduates and the transition from university to the workplace (Jackson, 2013; Murray et al., 2020; Sambell et al., 2020; Sarkar et al., 2016; Williamson et al., 2020). The use of WIL to maximise graduate capability and employability is well documented within the literature (Durham et al., 2020; Freudenberg et al., 2011; Jackson, 2013), with this paper adding to current research and encouraging the standardisation and mandating of WIL within undergraduate nutrition degrees. This study further supports WIL as a tool to foster employability skill development, however, further unpacking of the study findings is needed to better understand the employability skill levels of undergraduate nutrition students and how these can be improved to best support the development and capabilities of nutrition graduates though their undergraduate degree.

Fostering Career Management and Communication Skills through WIL

Of the individual skills, the most significant improvement was observed in 'developing and managing my career', followed by 'written' and 'research' skills. Significant development of career management

skills is reported in the literature (Reddan and Rauchle, 2017; Weldon and Ngo, 2019), with this skill increasing the greatest in Sambell et al. (2020). A unique aspect of WIL is the ability to provide insight into the realities of a profession, allowing students to learn how to manage themselves in different contexts and contribute successfully once they are in the workplace (Jackson, 2013; Reddan and Rauchle, 2017). Career options within nutrition can be an area of uncertainty due to the discipline's recent growth (Gaba et al., 2015; Murray et al., 2020) and nutrition students unsure of where to seek employment once they graduate (Barber et al., 2022). WIL has the potential to enlighten students about the relevance and diversity of nutrition across multiple areas, the scope of nutrition as a profession and the different work styles as documented by students in this study. Presenting the professional identity of nutrition within the workforce, through WIL, can increase the confidence of nutrition students and encourage proactive behaviour as they become aware of the range of further possibilities, diversify their nutrition skillset and develop plans to reach their career and professional goals (Durham et al., 2020; Jackson, 2017; Jackson and Wilton, 2016; Reddan and Rauchle, 2017).

Effective communication skills are fundamental for transitioning into the workplace (Durham et al., 2020; Jackson, 2014) as they encapsulate the ability to communicate to a diverse range of audiences using various mediums (Sonnenschein and Ferguson, 2020) and contribute to the development of other skills. 'Improved writing ability' and being able to 'convey information to lay terms' were common themes in the communication skill cluster, specifically written skills. Including written tasks within the WIL and/or nutrition curriculum may have enabled the perceived development of 'research' skills, key graduate attributes to be successful in the workforce (Murray et al., 2020). A further layer is the translation of scientific information to layman's terms, a skill that is not often taught in current nutrition programs and a skill, students in this study only developed during their WIL internship. These findings highlight the importance of including contextual learning across the degree as the academic style alone does not provide students the opportunity to develop a diverse communication and research skillset prior to graduation. Nutrition professionals acknowledged that while university settings may address the development of academic skills in relation to research and scientific writing, students' abilities to transfer these skills to a workplace requires further development (Croxford et al. 2022). WIL can provide opportunities, if set up correctly, for students to apply, practice, and further develop their communication and research skills in a workplace setting (Jackson, 2015; Murray et al., 2020; Smith, Ferns and Russell, 2016; Williamson et al., 2020) and address the perceived skill-gap reported by Australian employers (Sambell et al 2021, Deloitte Access Economics, 2017).

Possible Skill Gap - Developing Emotional Intelligence

A key skill for health professionals, 'Emotional Intelligence 1', while reporting a significant increase pre and post WIL, showed the least difference quantitatively, suggesting that students were managing their own emotions. This finding is a little surprising given the COVID-19 pandemic occurred during this period and under normal circumstances student stress levels during a WIL program are reportedly often elevated (Jackson, 2015). The link between WIL and stress, however, was not explicitly mentioned by students this study. In two separate studies, Zhoc et al. (2018 & 2020), have highlighted the positive correlation between emotional intelligence development on academic outcomes of undergraduate students. The theme 'awareness of self and others' was identified across 13 employability skills suggesting the reflective component of the ESCM-SAT may have increased a student's self-identity, awareness and personal agency (Billet, 2011; Helyer, 2015), encouraging students to make meaning of their experiences while providing a comprehensive and multifaceted approach to the skills reflected upon (Stowell, 2017). Critical reflections in combination with regular self-evaluation with WIL supervisors can foster greater self-awareness, increasing student self-confidence and emotional intelligence. The practice of regular self-reflection throughout a student's degree, not traditionally embedded in an undergraduate nutrition degree, may increase student capabilities to manage future situations and overcome barriers with a resilient, adaptable and proactive approach; all of which play a role in improving student employability (Potgeiter & Coetzee, 2013).

Three students, though, reported on their lack of ability/opportunity to develop any skill due to the unpredictable changes impacting their studies, internship and other parts of life due to the COVID-19 pandemic. For these students, the first COVID-19 wave, subsequent restrictions and lockdown (Johnston, 2021) may have limited opportunities for students to manage their emotions due to psychological overload and outcomes, such as reduced social contact, feelings of uncertainty, changes to university and WIL, and fears of contracting COVID-19 (Newby et al., 2020). Although only a small number of students reported this impact they should not be dismissed and in fact may highlight a potential gap within our curriculum. Health professionals due the nature of their work are required to perform in unusual and unprecedented situations, and the increased regularity of changing health circumstances globally embedding resilience and teaching students about and how to embrace the possibilities of disruption should be a key component of all heath, including nutrition, degree programs.

Importance of Mentoring and Exposure to the Professional Environment

The benefits of WIL compared to academic study alone was highlighted in student reflections, stating greater confidence in their ability to participate in the workforce by integrating feedback received during the internship into future professional practices, and familiarity with professionals and the workplace setting (Morgan et al., 2020). 'Mentoring from peers, supervisors and professionals' was identified by students across a range of employability skills, supporting the inclusion of constructive feedback within WIL and nutrition courses. The importance of multi-source feedback to evaluate performance and identify areas for future development is key to student development across a range of employability skills, with insufficient feedback often resulting in student difficulty to respond effectively (Jackson, 2015; Morgan et al., 2020). In addition to feedback from supervisors and educators, partnered WIL or peer assisted learning (PAL) models where students work alongside, debrief and learn from fellow students, allow another constructive avenue of multi-source feedback, with students stating this as a facilitator for skill development (Ladyshewsky, 2002). Students are more likely to have a more positive learning experience and further develop their skills if they are in an environment where they feel supported, valued, and part of a team (Hartigan-Rogers et al., 2007; Jackson, 2015; McCloughen et al., 2020; Morgan et al., 2020). 'Exposure to professional environment and content' through observation, participation and reflection in a real-world scenario combined with engagement through feedback will further facilitate understanding of social, corporate and personal responsibility (Jackson, 2015), thereby, assisting in providing students with a better understanding of the diversity and scope of the nutrition profession, and the opportunities to network with professionals in their field.

Limitations and Further Research

The potential limitations of this study include the ESCM-SAT being reliant on self-reported data, thus, the possibility of an overestimation of actual skill development and ability. Self-reported data is prone to social desirability bias, where students may revise their responses to suit what the researchers may be looking for, particularly as the ESCM-SAT was part of the student's assessment, and/or pressure to retain their self-esteem (Jackson, 2013). Further, the data itself is reliant on the students' perceptions of their skill development, being a subjective opinion of their own learning experience, rather than the objective reality, thereby creating potential of over or underestimation of actual skill development (Lizzio & Wilson, 2004). The pre-post model used for this study does somewhat address the perceived bias as students are asked to reflect on skill level at both time points. To assist students in understanding what each employability skill encompassed, examples of each were provided on the ESCM-SAT. This may have directed students to respond to these prompts rather than the overall skill itself, however, this is somewhat remedied by the post-test asking students to reflect on their broader cluster scores and use the provided tools to extend skill development. Finally, the impact of the COVID-19 pandemic during the conduct of this study could be seen as a limitation due to the perceived impact this may have had on students engaging with an authentic WIL experience and thus having a negative impact on employability skill development. While the WIL experience may have varied in terms of the

work environment or activities undertaken, changes to the internship were made to ensure students still obtained an authentic experience or an experience that allowed the student to extend their skills or learn new skills. For example, instead of observing in-person sessions with a client group, they would observe the session online. The quantitative results show that students improved in most employability skills thereby developing as future nutritionists.

Conclusion

This study supports the role of WIL on enhancing employability skill development in undergraduate nutrition students. Exposure to professional environments and content, mentoring from peers, supervisors and professionals, and awareness of self and others should be integrated both in academic and contextual learning within the degree structure to best support sufficient breadth and depth of employability skill development. Learning within the workplace environment through WIL is encouraged, as inclusion of these programs may shape nutrition undergraduate degrees to produce work-ready graduates and therefore their capabilities as the future nutrition workforce. Nutrition undergraduate degrees would benefit from further studies into how the skills can be embedded in traditional study courses and WIL opportunities within the degree.

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