ORIGINAL RESEARCH

An exploratory study of industry perspectives to inform undergraduate nutrition employability initiatives

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Abstract

Aim: The aim of this study was to explore nutrition professionals' perspectives of nutrition graduates' employability skills, and knowledge and skills required in the industry to understand gaps in undergraduate nutrition curriculum.

Methods: Nutrition professionals (n=26) across Australia were approached to participate in semi-structured interviews via telephone in 2018. Interviews were transcribed verbatim, data analysed using thematic analysis, and results interpreted and discussed.

Results: Nine participants across six work environments completed interviews. Common work roles were identified in their diverse areas of practice: nutrition educators, food developers, team members, and business leaders. Nutrition professionals identified that, in addition to evidence-based discipline knowledge, key skills and knowledge needed for their roles were interpersonal communication, including writing and listening. Participants highlighted the need for employability skills to be embedded within curriculum with emphasis on professional skills, business skills and discipline-specific skills in communicating complex science messages to a range of audiences. Networking, and formal and informal work-integrated learning were viewed as important vehicles for developing required skills. Participants expected that universities develop curriculum to address gaps; however, reflection by the academic researchers suggested this should be a joint role.

Conclusions: Early career planning, professional skill development, work experience and networking opportunities should enhance graduate employability.

KEYWORDS

employability skills, nutrition graduate, professional skills, work-integrated learning

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1 | INTRODUCTION

Nutrition graduates have a breadth of career opportunities available to them. Traditional roles include public health and policy, food industry, research and nutrition education, and there are many emerging roles such as in media and retail. The Nutrition Society of Australia has established recommended national nutrition science competency standards to inform university education and ensure graduates are well prepared for these roles. However, nutrition students and graduates have expressed anxiety and a lack of awareness of, and preparedness for, relevant employment opportunities. 3,4

Formal and informal experiences during university education can shape students' awareness of, and preparedness for, future career opportunities. Employability in undergraduate nutrition programs is an emerging area of interest, 3,5 with studies designed to inform disciplinespecific career readiness programs. A recent scoping review found that the most successful employability interventions are those that embed employability initiatives within the curriculum.3 This may require support from individuals outside of the faculty, as a qualitative exploration of academic views found that those who have built careers as academics without relevant industry experience feel ill-equipped to provide careers advice.³ More research is needed regarding the views of other stakeholders including students, graduates and industry professionals.

Based on the limited available research, it would seem that undergraduate nutrition students require opportunities to engage with the nutrition workforce in formal activities that are embedded in the curriculum and integrate key employment skills that are prioritised by future employers.³ International research exploring the views of students, academics and industry in a broad range of disciplines has identified work-integrated learning, or internships, as the most popular and important method of increasing graduate employability.6 These researchers also found that collaboration between universities and industry may support academics to include more authentic learning activities and assessment tasks.⁶ However, they found that measures perceived by academics and students as important for improving graduate employability may be seen as less important by employers, therefore highlighting the need to understand employers' perspectives.6

The aims of this study were to explore how nutrition professionals working across the nutrition industry in Australia view knowledge and skills of nutrition graduates; to understand industry perspectives of knowledge and skills required to work in the industry; and thus identify gaps in nutrition graduate employability, with a

view to using key findings to inform curriculum design in undergraduate nutrition programs to increase employability.

2 | METHODS

Ethical approval for the project was granted by the La Trobe University Human Ethics Committee (HEC18430). Funding for this study was through a 2016 La Trobe University Scholarship of Learning and Teaching Grant.

This study took place at La Trobe University, within the discipline of Dietetics and Human Nutrition. The discipline offers on-campus and online undergraduate human nutrition, undergraduate and postgraduate dietetics, and higher degree research studies. The focus of this research relates to employability of graduates from human nutrition undergraduate programs.

The research team hold the ontological view that there are multiple, socially constructed realities, and the epistemological position that knowledge is socially constructed by those active in the research process. These views align with constructivism, a research paradigm in which researchers collect and interpret naturalistic (real world) data to create new knowledge. Constructivist research is typically qualitative, with findings presented dependent on the lens of the researcher in interpretation of the data. The construction of new knowledge involves the incorporation of new information with existing understanding, and therefore the new knowledge that is constructed will reflect both the new data collected in the research process and the pre-existing understandings of the researchers. As such, it is important that the researchers' values are made explicit in the research process, and recognition of researcher stance is critical for internal coherence in nutrition research.8

The researchers involved in this study included academics involved in delivering undergraduate nutrition education, and a trained research dietitian contracted to undertake study activities including recruitment and interviews. All seven academic educator-researchers held undergraduate degrees in nutrition. Five had gained broad industry experience before beginning their academic careers. Their experience as nutrition educators ranged from 5 to 20 years. The perspectives and values of the research team were actively collected through semistructured interviews of academic co-investigators. Formal review and thematic analysis of researcher perspectives, as well as discussion of results amongst the research team, was used to identify researchers' perspectives and reflect on how researcher views aligned with/differed from participants. These views add important context and meaning of findings for real-world application.

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To capture the diversity of education, training, skills and experience of nutritionists, industry employers of nutritionists were mapped and included Australian food companies, multinational food companies, food producer associations, food retailers, meal delivery companies, quick service restaurants, local, state and federal, government and statutory agencies, not-for-profit organisations, corporate health organisations, media, marketing, public relations and communications agencies, entrepreneurs and sports nutrition services. Industry participants for this study were required to be working in a nutritionfocused role within one of the abovementioned sectors. Industry participants were identified using a purposive and snowball recruitment strategy to maximise representation across the sector. Initial industry participants were approached via email through networks of the research team and secondary participants through these links. Reminder emails were sent to all potential participants prior to and during the data collection period. A broad call for participation was not used as a recruitment strategy due to the limited time frame for data collection as

Data were collected using semi-structured interviews, a method commonly used in interpretivist research to gather raw data that is subject to analysis and interpretation. Interview questions were developed collaboratively by the research team using inquiry logic⁹ and designed to address the aims of the study by eliciting information regarding graduate employability, skills required in the industry and gaps in undergraduate nutrition curriculum to inform the development of employability initiatives. The interview guide consisted of 12 questions focusing on five areas: current employment and role description, formal and informal education and training pathways taken, recommendations for curriculum based on work experiences following graduation, past employment and advice for graduates looking for their first job (see Appendix S1).

outlined in the Grant guidelines.

Telephone interviews were conducted by the research assistant at times convenient to participants. All participants were provided with a Participant Information Statement and Consent Form with their invitation to participate. Participants were provided the opportunity to discuss the research prior to completing and submitting their consent and were able to raise any issues at conclusion of the interview. All interviews were conducted in September 2018. Interviews were audio-recorded and transcribed verbatim. Participant names were not included in data files for analysis to provide maximum anonymity. Data files were stored on La Trobe University's secure research portal. NVivo 11 qualitative data analysis software was used as a tool to support data analysis.

Data were analysed using thematic analysis because it provides a structured and rigorous method for interpreting data, and constructing meaning, without generating theory. 10 Inductive thematic data analysis was conducted using Braun and Clarke's six-phase approach.11 Two members of the research team conducted initial analysis of the data. During this first stage of analysis individual researchers conducted in-depth line-by-line reading of the data. While the interview questions suggested priori codes these were not developed further given the inductive approach to analysis. Next, initial codes were identified by individual researchers. Where meaning in the text was unclear, researchers discussed the text to reach consensus. Codes were cross-checked between researchers and where disagreement occurred, a third person, from the broader research team, resolved the issue. Following this, further analysis by the same individual researchers identified themes by collating codes. Codes were collapsed when the apparent themes were congruent. Major themes were confirmed by the two researchers when the text became repetitive, where text presented a high degree of commonality across several transcripts, and where a process of comparing and contrasting text yielded clear similarity to other text. Results were presented to the broader research team as summary tables of codes, major and other themes, and extracts from transcripts were selected to provide relevant examples.

Terms used frequently by participants that may have complex interpretations have been defined below in a manner best representing the views of participants to enable a common understanding:

Professional skills: non-technical skills or those unrelated to discipline skills that are inherent or acquired through education experiences including communication, teamwork, leadership, adaptability and interpersonal skills these are also known as soft skills.

Work-integrated learning: educational activities that involve academic learning of a discipline within the practical application of a workplace, also referred to as 'internships'.

The Checklist for Authors and Reviewers of Qualitative Research¹² was used to guide the reporting of this study.

RESULTS 3

A total of 26 nutrition professionals were approached to participate, 14 did not respond and nine participated. Reasons for not participating (n = 3) included lack of time, unable to find suitable time, connectivity issues at

TABLE 1 Common career roles, work responsibilities, and required skills and knowledge identified by industry participants in current roles (major themes in bold)

Career roles	Work responsibilities	Skills and knowledge needed
Nutrition educators	Writing/creating nutrition related content Translation of evidence-based science Communicating on food and nutrition	Interpersonal communication Writing Credible, evidence-based nutrition knowledge Social media skills
Food developers	Food and recipe development	Credible, evidence-based nutrition knowledge
Team members	Communicating with people	Interpersonal communication Listening Teamwork/collaboration Reflective Resilient/confident Accountable
Business leaders	General business skills and acumen, e.g. budgeting Managing people	Influencing people/policy Strategic thinking/planning People management

the time of interview, and inability to reschedule during study period. Eight participants were female and one male. The relatively small number of industry participants is a limitation that is acknowledged by the research team; however, analysis revealed common themes. Industry participants represented nutritionists across the following sectors: multinational food companies (n = 2), not-for-profit organisation (n = 1), producer association (n = 1), media, marketing, public relations and communications (n = 3), entrepreneur (n = 1) and meal delivery company (n = 1).

While there is a diverse range of career opportunities available to nutritionists, the responsibilities described by participants could be collapsed into four main work roles common to many areas of practice: nutrition educators, food developers, team members, and business leaders. Participants described the required skills and knowledge for their current positions which also aligned with these work roles, with strong interpersonal communication skills, including writing and listening, identified as major themes (Table 1).

Overwhelmingly, industry participants reported that undergraduate nutrition education did not provide adequate preparation for their current or intended industry role, with the acknowledgement that several held senior management positions not suitable for new graduates and requiring upskilling from postgraduate studies, internal training or onthe-job experience. Education was perceived to provide only the theoretical (scientific) background for the industry role; however, there was acknowledgement that some professional skills were developed, e.g. independence. Gaps in current education identified were development of strong interpersonal communication skills and translating scientific terminology into lay language.

One participant commented:

'I've interviewed a lot of graduates and I again, I still feel that there is a real gap in their ability to communicate, to translate. I give them little assignments to do. They have to bring back blog posts and Facebook posts and all sorts of things for me. It's just really interesting that a lot of them just don't really know how to think from a comms/marketing perspective in terms of, who's my target, what would they need to know? How do I research to ensure that I've got good quality evidence to support what I'm saying? I just think there's some fundamental gaps in their ability to do those things'. I2

Additional themes identified as gaps in current education included professional skills, e.g. presentation skills; business skills; writing proposals; entrepreneurship; and support for volunteering.

To address these gaps in education, industry participants proposed a range of ideas for future curriculum development through structure and delivery of courses, and development of knowledge, skills and attributes, including professional skills, such as managing criticism, and business skills, such as marketing (Table 2).

One participant commented that the curricula should be:

'...more about starting your own business, entrepreneurship, project management, presentation skills; I think more soft-skill-based activity that would enable you to perform

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TABLE 2 Strategies recommended by participants to address employability-related gaps in undergraduate nutrition education

Structure	and del	iver
of courses	S	

Accommodate different learning styles Develop dedicated employability subjects Offer streams of study for diverse career options Invite guest speakers from industry

Skills and attributes to develop through learning activities

Business skills
Marketing
Resume building
Media, social media management
Project management
Leadership
Presentation skills
Solution-based learning
Reflection, understanding
strengths
Resilience, managing criticism
Assertiveness
Influencing people
Translation of evidence-based
nutrition science into lay terms

your role ... you need to be a good person and you need to know how to conduct yourself and hold yourself ... and have all these skills in addition to having the intellectual knowledge'. I6

A greater emphasis on communication skills and building an understanding of the diversity of industry roles were also proposed. Industry professionals felt specific units of study focusing on industry employability would be of greater benefit than learning outcomes embedded throughout a degree program.

Another theme identified from industry participants was the high value of industry work experience for students, either from volunteering, internships or workintegrated learning, as a pathway to acquiring postgraduate contractual or part-time employment. Work experience was reported to lead to new networks and development of relationships with role models, mentors and potential employers. Industry participants were most familiar with dietetic, industry work-integrated learning, and reported a clear value to students with mutual benefits to the workplace. Work-integrated learning was seen to prepare students for the workforce by providing network links to employment and insights into the scope of opportunities in the field. For industry, work-integrated learning was an opportunity to access and nurture potential recruits plus obtain business support via student projects. The responsibility for providing work-integrated learning was perceived to be that of the university with industry taking a secondary, reactive role in responding to requests, rather than initiating independent or sectorwide programs.

One participant explained the links to employability:

'So placement's not just placement; placement is advertising of you [the student] as an employable person. We've supervised lots of students and I can see when there's potential, because sometimes you get people, who just get it. I would always say to students that your placement's not just a box that you're trying to tick to get your degree. ...these are your colleagues you're working with and they will be your colleagues for the rest of your career. You're advertising yourself to them. It's like a job interview. [my x company] has hired ... people out of university three from their [dietetic] placements because we could see potential'. I3

When addressing advice to students seeking careers in industry, two themes were identified. The importance of establishing business networks with genuine connections whilst a student was seen to be key through social media visibility (e.g. LinkedIn) and seeking out multiple opportunities for face-to-face interactions. Secondly, volunteering was emphasised as a vital platform to grow networks. Additional themes included seeking assistance to build a strong resume, being nimble to different opportunistic pathways, and early strategic thinking towards industry career goals.

One industry participant commented:

"...looking at their work experience history is a really important one and finding, especially in the area that I work, I was very interested in students that had sought out writing internships or more communication style of placements and had experience and volunteer - even volunteer work in writing or speaking or - just I guess something a little bit more consumer-focused...". I4

4 | DISCUSSION

Nutrition professionals from a range of practice areas in this study offered valuable perspectives on knowledge and skills required to enhance nutrition graduate employability. They identified that communication skills were critical in their current roles, with business skills and professional skills required in addition to discipline-specific skills and knowledge. Nutrition professionals shared a range of potential strategies to improve graduate

employability. These included student-driven activities such as strategic career and study planning, networking, work and volunteer experience, as well as universitydriven activities such as explicit teaching of business and professional skills, and creating more opportunities for work-integrated learning. These recommendations align with those of Australian dietetic graduates. Bacon et al. 13 surveyed graduates who reported the need for greater emphasis on communication skills and more placement. They also recommended more business, management, marketing, technology and job recruitment awareness be included in the curriculum. Interviews with Australian dietetic graduates confirmed that they experience a lack of support in transitioning to the workplace.¹⁴ Dietetics education programs in Australia are specifically designed to support students to enter the workforce as entry-level practitioners and include at least 100 days of supervised workplace learning. There are no such requirements from accrediting bodies guiding nutrition education programs, thus highlighting the need for universities to develop and implement strategic initiatives to support graduate employability.

Participants represented a diverse range of nutrition career pathways including consultants, business owners, public health nutritionists, nutrition magazine editors, nutrition managers at large private food companies, and product developers. Given the diversity of nutrition career pathways and the differentiation of desirable skills required, consideration needs to be given to how employability skills, as well as role specific skills, are developed and offered to nutrition undergraduates.

Participants deemed effective communication with others as well as the ability to translate and present scientific evidence in lay terms as essential skills of industry nutritionists and highlighted the importance of professional skills for graduate employability. Finch et al. 15 also identified professional skills such as communication, interpersonal skills, and the ability to problemsolve and employ critical thinking as the skills most desired by graduate employers, and recommended that universities include learning outcomes related to professional skill development in their programs. The scoping review by Murray et al.³ also concluded that employability skills development should be embedded within curriculum. However, during reflexive interviews, the research team academics involved in delivery of the nutrition curriculum reported experiences suggesting that students can be resistant to learning employability skills at university, perceiving that universities are designed to teach nutrition science rather than professional skills. Student resistance to learning nontechnical skills has been reported by academics in other disciplines, 16 and Succi and Canovi 17 found that students undervalue the importance of professional skill development relative to employers.

While participants acknowledged that the university setting adequately addressed development of academic skills in relation to research and scientific writing, they felt that students' ability to transfer these skills to a workrequires further development. **Participants** highlighted the relative lack of entrepreneurial skills including business and project management, budgeting, planning, and understanding how to conduct oneself in the workplace. Participants acknowledged that they had developed these skills on the job or through further training yet suggested that these skills should be embedded in undergraduate university education. Business skills as well as other pathway-specific skills such as media communication are not included as competency skills of a nutrition graduate.² However, with industry recognising the benefit of business acumen, and the constantly growing demand for students to better understand media communications, development of these skills could be beneficial for some nutrition career pathways. Embedding all skills for every nutrition career pathway is not realistically achievable due to an already crowded curriculum; however, the university setting may be able to provide an opportunity for students to acquire specific skills through major or minor streams, or with targeted elective subjects incorporating work-integrated learning. This would allow students to attain skills related to the study pathway of choice and provide them with a specific career-ready advantage. The realities of the current university environment in Australia and impacts of staffing and resources, and the COVID-19 related contraction of business, 18 may encourage opportunities for crossdiscipline or discipline-university service collaborative approaches to provide opportunities for students to develop the required skills.

Work experience was universally identified by participants as positive for undergraduates, with benefits including building networks, understanding employability skills, building professional skills, and applying theory to practice. A potential barrier to implementing nutrition work-integrated learning, beyond the administrative burden on the academic institution, is the desire to seek and maintain work-integrated learning partners that include a broad range of nutrition career pathways. Secondly, there may be a requirement for students to choose a pathway prior to work-integrated learning and the potential that degrees may take longer to complete in order to incorporate a work-integrated learning opportunity. 19 However, not including work-integrated learning or some form of work experience as part of undergraduate nutrition programs is a disservice to industry, as participants in this study claim that graduates require

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additional on-the-job training to develop role-specific skills. Participants suggested that the work experience could be formal work-integrated learning or voluntary work as both offer the opportunity to gain experience in a workplace setting. Both mandatory and optional volunteering were perceived to offer valuable skills and a 'means to expand networks and experience' by participants in the Griffith Dietetics Graduate Outcomes Survey.²⁰ Both options provide students with valuable work experience, and a platform to develop employability skills and build networks, as well as benefit industry by providing additional capacity and a more work-ready workforce. A future direction could see greater industry involvement or ownership of structured work-integrated learning; however, industry participants in this study did not appear to see this as their role, placing the responsibility with academic institutions.

Advice for students offered consistently from participants was the importance of networking and building experience. Networks were identified as including peers, work-integrated learning employers and teams, connections made through independent work experience, and volunteering connections. Participants identified that beyond building a network of people that students know, it is equally important to build a professional reputation through networking to benefit potential career pathways. This position is supported in the literature where networking has been related to internal and external perceived employability by increasing access to information and resources, 21 and a longitudinal study that found networking was related to career satisfaction, salary, and rate of growth of salary.22 The second key message related to 'getting involved', referring primarily to engaging in volunteer opportunities with organisations recognised for their work in food, nutrition and health. Not only does this provide an opportunity to expand the students' networks, but also provides an opportunity to gain valuable industry-related work experience, and develop highly valued professional skills such as interpersonal skills, communication, problem solving and critical thinking, all of which enhance employability skills. The final key piece of advice for students was related to early identification of their desired career pathway to maximise the opportunity to specialise in relevant areas of study, take up targeted extracurricular activities and enhance future employment opportunities.

Participants expressed their view that professional skills be taught in the university setting, and that students need to recognise that they are learning these employability skills and the purpose for learning them. O'Leary²³ also concluded that perception of employability skills development opportunities is a key factor in how well employability attributes are actually enhanced in graduates. Reflecting upon this finding, the researchers propose that while looking at ways to further develop employability skills, it may also be prudent to signpost the inclusion of existing professional skill development and communicate the purpose and benefit to the student's future career. Given the current challenges facing the university sector, it might be a more promising alternative for industry and academia to work together to increase students' awareness of the importance of professional skills, and to provide more opportunities for students to develop professional skills through work experience.¹⁷

Fit-for-purpose skill building for future careers provides students with the opportunity to develop knowledge and skills specifically related to roles within the student's chosen nutrition pathway. While challenging, university nutrition degrees approach this in several ways, including offering streams of study focusing on developing the required skills for specific pathways, or offering electives that support the student's chosen pathway where concepts and content sit outside of the core competency areas.² Prior to being able to take advantage of either of these strategies, students need to know the pathways available, understand the career opportunities related to the pathways, and have decided about the pathway they wish to pursue. Participants suggested that more needs to be done to assist students to better understand the diverse range of pathways for nutritionists. If students have clear goals, then they can choose elective subjects, work-integrated learning, or seek volunteer opportunities to further develop the skills specifically related to their area of interest. Reddan²⁴ found that both career planning and work experience increased student perceived work self-efficacy in undergraduate students.

The diversity in nutrition career pathways creates opportunities and challenges for students, the university sector, and industry. To meet these challenges, all stakeholders need to contribute to supporting the development of work-ready nutrition graduates. The university sector should provide early study and career pathway planning, supported work-integrated learning opportunities, and signpost professional skill and competency development in collaboration with industry, and other cross-university disciplines and systems. Students should build networks, seek out relevant paid and voluntary experience, and develop employability skills. Industry should actively generate and support formal work-integrated learning programs, contribute to university curriculum advisory panels, and careers and other events that make clear for students the application of their study to industry roles.

Limitations of this study include the small sample size, yet a strength is the diverse range of perspectives from industry stakeholders included in the analysis. The majority of the participants had experienced work-integrated learning in their university education,

which provided important insight into the benefits of work-integrated learning and work experience from the perspective of both the graduate and employer. A strength of this study was the theoretical positioning of the research team, academics involved in the delivery of undergraduate nutrition education, that drove the study design, analysis and interpretation of results for application in the real world of undergraduate nutrition education. While the purpose of this research was to inform curriculum at one Australian university, the insights gained are applicable for nutrition programs throughout Australia and internationally.

Industry professionals in this study identified gaps in employability of nutrition graduates, and roles for students, industry and universities to address these gaps. Early career planning, professional skill development, work experience, and networking opportunities in undergraduate nutrition programs, developed in partnership with industry should enhance graduate employability.

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CONFLICT OF INTEREST

Emma Stirling has been involved in nutrition consulting to industry for more than 15 years on a range of separate projects; however, there is no direct conflict of interest to this research. All other authors report no conflicts of interest.

AUTHOR CONTRIBUTIONS

AF conceptualised the study. All authors contributed to study design. EM conducted the interviews. SC and EM completed data analysis. SC, ES, SM, JB and AF drafted the manuscript. All authors critically reviewed and approved the final manuscript, and declare that the content has not been published elsewhere.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

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