



From we ask to iASK: a self-reflection strategy enabling students to connect assessment and employability

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Abstract

Most students acknowledge shared responsibility, with the university, for their employability development. Many academics use assessments as the main driver for motivating students to learn. At the intersection between employability, assessment and learning, the emergent research question is - what are the mechanisms by which course-based employability is fostered? Prior research reveals that although academics identified course-based assessment as the key employability mechanism, neither students nor employers registered this conceptualisation, and thus purpose of assessment. The aim of this research was to stimulate and communicate the direct connection between assessment and employability to students and interpret their response. Over 100 first-year students, across a metropolitan and regional Australian university, participated. Students were directed to use a simple reflective tool, dubbed iASK by the researchers, that probed employability elements of identity, Attributes, Skills, and Knowledge. The research revealed the resulting student view that regular course-based assessment can develop their employability skills in communication and independence, but not in critical thinking and global citizenship.

Keywords

Employability, assessment, reflective practice, first-year experience

Introduction

Student-focussed research has shown that finding a suitable job after graduation is a key concern shared by many university students, globally and across disciplines (Jorre de St Jorre & Oliver, 2018; Pigden & Jegede, 2020; Tomlinson, 2008; Tymon, 2013). However, students' understanding of factors of importance to employment are more variable, and students who need opportunities to develop knowledge and skills relevant to careers often do not pursue those opportunities until late in their degree, if at all (Doyle, 2011; Jorre de St Jorre et al., 2019; Tymon, 2013). For this reason, universities

have sought to embed skills and knowledge of importance to employability into the formal curriculum, where all students can benefit (Clarke, 2018; Oliver & Jorre de St Jorre, 2018). However, research examining student perceptions of such curricula (e.g., curricula specifically designed to develop graduate attributes), suggests that where capabilities are embedded, they also need to be explicitly communicated or assessed, otherwise it is common for students to remain unaware of the skills they have demonstrated or the relevance of their achievements (Hill et al., 2020; Hill et al., 2019; Jorre de St Jorre et al., 2019; Jorre de St Jorre & Oliver, 2018; Lock & Kelly, 2022).

Student-centred professional development for employability requires guidance, intentionality, and mechanisms for reflexive practice. Guidance should not be left until near graduation conversations or rely on students accessing extra-curricular career services (Cook, 2022). Instead advancing employability requires guidance in revealing the range of employability practices, such as timely and ongoing reflections on assessment tasks over the course of a student's study. Jorre de St Jorre and Oliver (2018) coined this practice, 'assessment for employability' (p. 55).

Assessment for learning is a well-established pedagogy which recognises the influence of assessment on where students direct their effort (Carless, 2017; Hattie, 2009). Students also hold assessment in high regard in relation to their learning (Ashford-Rowe et al., 2014; Boud, 2007; Crisp, 2012; Hughes & Barrie, 2010). Unfortunately, research has shown that students rarely see connections between assessment and employability (Kinash, McGillivray, & Crane, 2018), even in relation to curriculum specifically designed to integrate the practice of work with theory (Ajjawi et al., 2019). Students completing assessment activities is a primary means to develop their employability, within a disciplinary/industry context, and completed assessment tasks can be used as evidence of achievements to converse with and/or show to prospective employers (Jorre de St Jorre & Oliver, 2018). The mechanisms for independent or guided reflection are, however, unlikely to be helpful let alone successful without reinforcing the connection between assessment and employability.

Awareness is the essential intermediary factor that determines efficacy in the connections between assessment, learning and employability (Bennett et al., 2017; Dacre Pool & Sewell, 2007; Farenga & Quinlan, 2016; Jorre de St Jorre et al., 2019; Qenani et al., 2014). Beyond awareness, students also need to develop the ability to present their claim that they have developed the skills, attributes and identity that are required for the particular employment opportunity (Holmes, 2013; Sarkar et al., 2021). Developing efficacious employability by assessment techniques is a keystone for lifelong professional development, mentoring and managing, as well as innovation and discovery.

There is a lack of research focused on effective practices that students can use to link employability and assessment. Moreover, we argue that this link should be made very early in the student's university life (Sambell et al., 2021). Our argument is grounded in previous research that has concluded the importance of aligning employability initiatives with student expectations (Aasheim et al., 2009; Nilsson, 2010). By making this link in the first-year of university, students have been shown to have improved demonstration of key employability skills and academic attainment in subsequent years (Hanna et al., 2015). Therefore, students' perceptions of employability can be enhanced at first-year level if the link of employability with current assessment practices is made clear and explicit. We introduce a reflective tool (identify, Attributes, Skills, Knowledge, iASK) that students can use to link employability with assessment, and we investigate the first-year students' point of view by means of thematic analysis of their responses.

The paper proceeds to describe the theory that underpins the development of the iASK tool and we describe the methods and results from a study where we invited first-year university students to use the iASK tool as part of their reflective practice. Through thematic analysis we discovered the types of

assessments that students linked to specific employability learning. The research questions to guide the second part of this paper were:

- 1) Do first-year students link employability learning through assessment after completing the iASK tool?
- 2) Do first-year students associate assessment types with specific employability learning after completing the iASK tool?

Theory underpinning the iASK reflection tool

There is widespread agreement regarding the function of higher education in developing the career-ready student and that this is a multi-faceted function. Knight and Yorke (2003a) identified the four main determinants of employability as understanding (U), skills (S), efficacy (E) and meta-cognition (M), comprising the USEM theory. The authors argue that *understanding* is equivalent to what pedagogical theorists, such as Bloom et al. (1956) called *knowledge*, that *efficacy* is equivalent to what theorists such as Barrie (Barrie, 2006) and Oliver (2013) call *attributes*, and that *meta-cognition* is equivalent to what theorists such as Knight and Yorke (2003b), and others such as Bennett et al. (2017) and Holmes (2013) also call *identity*. Graduate attributes have been comprehensively researched, intersecting with employability research. Researchers such as Oliver and Jorre de St Jorre (2018) and Star and Hammer (2008) have identified that the graduate attributes, described as the overall capacities (independent of discipline) are developed through the student learning journey and are desirable (by employers) qualities of graduates.

The skills-led approach to graduate employability has been a traditional method for the higher education sector for many years (Dearing, 1997), even though skills cannot be developed in isolation of other employability components. Research from the UK has revealed employers' overall perceptions of graduate employability requiring a complex and composite graduate identity (Hinchliffe & Jolly, 2011). Identity is not fixed for every student as formation depends on the context, which is why we argue that good practice in identity-formation is facilitated through curriculum-embedded reflective practice based on the assessments that students are already expected to complete. In other words, the approach is embedded rather than 'bolt on' (Cook, 2022). The student's performance of assessment tasks is one way for students to develop their identity (Holmes, 2001). The assessment tasks can also be used to develop knowledge and attributes, which have been the focus of many literature studies describing employability (Clarke, 2018; Steur et al., 2012).

Deriving a practice-based instrument from the above theory would engage four main components of employability learning: i (identity), A (attributes), S (skills) and K (knowledge) to comprise the iASK model of learning employability through assessment.

These four components overlap and intersect, with the primary aligned questions as follows:

- (1) What did I learn about myself, related to my graduate career, through doing this assessment activity? (**Identity**);
- (2) How have I progressed my overall development and become more through doing this assessment? (**Attributes**);
- (3) What skills (technical and transferable) have I developed through doing this assessment? (**Skills**);
- (4) What career-related information and understandings have I developed through this assessment activity? (**Knowledge**).

Beyond knowing that assessment and employability interact, students require a nuanced ability to leverage discipline-based assessment for employability. Arguably, it is good practice if students are informed early in their education, so that they can apply their learning throughout. The study reported in this paper examined the use of a simple tool (iASK) to connect assessment and employability learning, for first-year students.

Methods

Human ethics approval was granted to conduct this research. The researchers at two Australian universities intentionally recruited diverse perspective through using multiple means to invite as many first-year students as possible to take part in this study. Some students were invited through a specific tutorial on employability, and some were invited through emails from unit or programme coordinators or community of practice members (including careers advisory, academic and professional staff). Participants accessed the tool through a link providing the research information, informed consent, and brief online module about employability for students who wished to proceed. Participation was voluntary, was not a hurdle requirement, and did not impact on their grades. Participants were anonymised at the data collection stage. Those students who wished to proceed watched a short video (see: <https://player.vimeo.com/video/398441740/>) which explained the iASK tool (Figure 1) and how it could be linked to an assessment item of their selection. Participants provided key demographic information that was used to categorise students into seven broad discipline areas (Table 1). Participants were then asked to choose one assessment item and put it at the centre of the iASK tool. The example that participants were given in the online video was a laboratory report. Students then completed the rest of the iASK tool as instructed from the video.

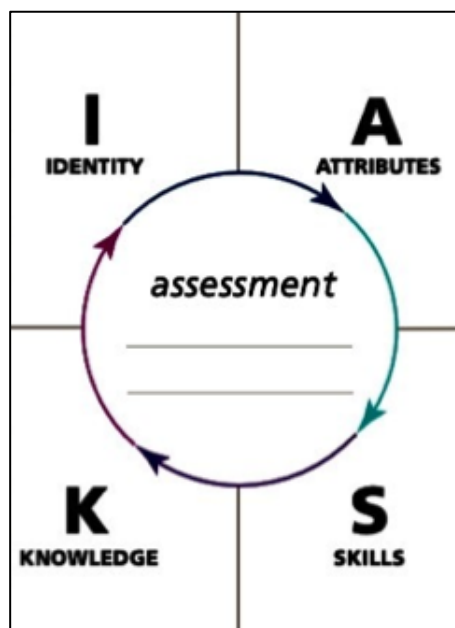


Figure 1: An Example of the iASK Tool Used by Students to Reflect on their Assessments and Link to their Employability

In total, 114 first-year students participated in this study. Students reported numerous subjects in the description of their major. This is to be expected from first-year Australian university students where multiple degree pathways are still open to them during their first year. The list provided in Table 1 describes the first subject indicated by students in their major sequence only and have been grouped together into overarching disciplines.

Table 1: Number of Students per Discipline who Completed an iASK Survey.

Discipline	Number of Students
Engineering (including Mechanical, Chemical, Electrical, Mining, Civil)	45
Medicine, Biomedical and Health Sciences (including Pharmacology, Nursing, Microbiology and Immunology, Pathology and Laboratory Medicine)	27
Biological Sciences (including Biochemistry, Genetics, Anatomy and Human Biology)	21
Physical Sciences, Data Science and Math (including Chemistry, Physics, Geology, Computer Science and Math)	15
Psychology	4
Economics	1
Philosophy	1
Total	114

NVivo was used to conduct reflective thematic analysis following abductive (shuttling between grounded and scholarly insights into the assessment-employability connection), realist (drawing on student insights and experiences in the reality of student participants), and semantic (focussing on the explicit level of expression by participants) conventions (Braun & Clarke, 2006). The first stage of analysis was to identify the full set of themes emergent from the student responses to the iASK tool. From the 114 student responses, there were 456 data-points (114 responses x 4 sectors of iASK). In this first stage, each of these data points was coded to the iASK categories of assessment type, identity, attributes, skills and knowledge. The responses from students were coded based on the overall theme. For example, the code 'technical' was assigned if a student response specifically referenced the studied discipline. The code 'communication' was assigned when the student response related to an oral or written skill that they were developing.

The second stage was to code the first stage themes to align with the list of employability learning (graduate attributes), across the iASK categories (Table 2). These themes were: communication, critical thinking, global citizenship, teamwork, independence, problem-solving and information literacy (Oliver & Jorre de St Jorre, 2018). This involved the sorting of student statements from the iASK tool into digital groupings by identifying and sorting the synonyms and other similarities and differences grounded in the terminology students themselves used to describe the phenomena (what employability learning they gained through assessment). The lead researcher then transferred focus from the employability learning groups to the relationships between the employability learning and the type of assessment described. The lead researcher returned to the data multiple times, interrogating the groupings and the evidence for classifications, and making changes to coding and interpretation. One other researcher independently checked the codes, frames and groupings and raised discrepancies and differences of opinions where they arose. The two researchers discussed the variance and arrived at consensus as to classification. Descriptive statistics were performed to describe the most popular themes that arose from the thematic analysis.

Table 2: Second stage coded themes placed in employability learning previously published by Oliver and Jorre de St Jorre (2018)

<p>Employability Learning published by Oliver and Jorre de St Jorre, (2018).</p> <p>What employers might need, or universities emphasise?</p> <p>* Indicates new employability learning</p>	<p>Coded Entry: From the 32 codes of the iASK responses by 114 students.</p>
<p>Communication- oral communication, written communication</p>	<p>Technical Communication Professionalism</p>
<p>Critical Thinking-critical and analytical thinking</p>	<p>Data Analysis Critical Thinking</p>
<p>Global Citizenship- ability to interact with co-workers from different or multi-cultural backgrounds</p>	<p>Networking Interpersonal Skills</p>
<p>Teamwork- working collaboratively with colleagues to complete tasks</p>	<p>Collaborating Enjoyment-Group Leadership</p>
<p>Independence-learning and working independently, highlighting resilience and mental wellbeing</p>	<p>Work Alone Independence Motivation Time on Task Persistence Dedication Determination Discipline Multi-Tasking Work Ethic Maturity</p>
<p>Problem Solving- developing innovative ideas, adapting knowledge and applying skills in different contexts</p>	<p>Problem Solving Application of Knowledge</p>
<p>Information Literacy- emphasising the ability to judge the veracity of information</p>	<p>Research</p>
<p>Organisation*-preparing and organising work, team members and priorities, having clear goals set from the out set</p>	<p>Clear Expectations Organisation Preparation</p>
<p>Other*- codes that the researchers could not place in any of the employability categories as above.</p>	<p>Self-Awareness Creativity Curiosity Easy Going Capable</p>

Results

Employability learning themes in each iASK category

Across the 456 data points, a total of 596 descriptions were found in the 32 coded themes. Some entries by students covered multiple codes, therefore, the number of descriptions is greater than individual data points. The students allocated these descriptions of codes nearly evenly across the four iASK categories (identity 25%, attributes 25%, knowledge 24% and skills 26%). The coded entries were then matched against the employability learning themes (Oliver & Jorre de St Jorre, 2018). The majority clustered in communication, independence and organization. These three themes accounted for almost 75% of the student comments. The lowest weighted descriptor was global citizenship, which accounted for 1.5% of the coded descriptors.

Descriptive statistics are provided for the iASK categories (Table 3). The 'other' category, which included codes such as self-awareness, creativity, and capability, was too diverse for comment based on the descriptive statistics conducted with the iASK categories. Overall, independence and organisation accounted for most of the responses by students for identity and attributes sections of the iASK tool, whereas communication dominated responses in skills and knowledge.

Table 3: Percentages Represent the Distribution of the Coded Comments in a Particular iASK Category (column) Across the Nine Employability Themes.

Employability Themes	identity	Attributes	Skills	Knowledge	
Communication	2.0%	0.0%	54.9%	55.3%	
Critical Thinking	2.7%	1.3%	2.0%	4.3%	
Global Citizenship	0.0%	0.0%	2.6%	3.5%	
Teamwork	22.0%	3.3%	0.7%	2.1%	
Independence	37.3%	78.9%	14.4%	5.7%	
Problem Solving	0.7%	1.3%	9.8%	11.3%	
Information Literacy	0.0%	0.0%	11.1%	16.3%	
Organisation	35.3%	7.2%	2.0%	0.0%	
Other	0.0%	7.9%	2.6%	1.4%	too diverse to comment

The colour ranges classify the theme responses: dark green (high), yellow (medium) and red (low) (N = 114. Some entries by students covered multiple codes, therefore, the number of descriptions is greater than individual data points.)

Students indicated the strongest association for building capacity for communication as sitting alongside knowledge and skills, and building capacity for working independently to be associated with identity and attributes. In other words, students appeared to perceive that communication was strengthened through learning what is required from the assessment, and then in practicing the writing and speech skills to deliver. The quotes provided throughout this section are examples from the student's response to emphasise the employability theme being discussed.

Working independently was developed through the experience of doing the assessment by themselves, observing their ability to do so effectively, persevering, and being dedicated and positively shifting their self-confidence. The overwhelming response by students to the iASK question about identity from these assessments was having clear expectations, meeting the deadline in good time and having the motivation to get the task complete. An example of such a response was 'I like to work with clear deadlines and get work done efficiently and quickly' (Student 100, University 1, Bachelor of Biomedical Science).

Another subset of codes within the independence theme in the attributes classification were focused on determination, resilience, and self-improvement: 'I am persistent and will always aim to complete the task by the deadline. I am constantly acknowledging the feedback I've been given and working to implement them to improve my work' (Student 9, University 2, Master of Professional Engineering).

Therefore, these first-year students appear to intentionally be using their assessment tasks as a means to develop their determination to complete tasks in an efficient manner. Students also identified that organisation was a key employability learning theme associated with getting the assessment completed. Student responses indicated that the demands of assessment task completion change their identity, and develop their positive attribute of working independently, as demonstrated by the quote from Student 19, University 1, Bachelor of Professional Engineering: 'I am a person who likes everything to be completed with 100% effort, I am organised and persistent.'

Employability themes in each assessment type

The seven most popular assessment types used to conduct the iASK reflective exercise described by students were laboratory report (28), group work (16), essay (12), life cycle assessment (11), exam-quiz-test (10), laboratory (7), and oral presentation (6) (Table 4). These assessment types accounted for 485 of the 596 coded descriptions (81% of all responses) and 90 of the 114 students (79% of all students).

Table 1: Percentages in each row represent the contribution of each employability learning theme for a particular assessment type

Assessment Type (number of students selecting this assessment)	Communication	Critical Thinking	Global Citizenship	Teamwork	Independence	Problem Solving	Information Literacy	Organisation	Other
Essay (12)	16.0%	0.0%	0.0%	6.0%	24.0%	16.0%	18.0%	10.0%	10.0%
Exam-Quiz-Test (10)	16.3%	2.0%	2.0%	0.0%	30.6%	22.4%	0.0%	10.2%	16.3%
Group Work (16)	24.3%	0.0%	5.8%	13.6%	23.3%	7.8%	6.8%	9.7%	8.7%
Laboratory Report (28)	35.2%	0.0%	6.2%	3.7%	28.4%	6.2%	6.8%	9.3%	4.3%
Laboratory (7)	37.9%	0.0%	6.9%	6.9%	27.6%	10.3%	0.0%	6.9%	3.4%
Life Cycle Assessment (11)	28.6%	0.0%	5.4%	1.8%	8.9%	12.5%	14.3%	12.5%	16.1%
Oral Presentation (6)	22.2%	0.0%	2.8%	0.0%	30.6%	8.3%	8.3%	8.3%	19.4%

The colour ranges classify the assessment-theme responses: dark green (high), yellow (medium) and red (low) (N = 90. Some entries by students covered multiple codes, therefore, the number of descriptions is greater than individual data point.

Laboratory and the laboratory report

Students directly distinguished between a laboratory assessment, where students complete a task within the laboratory time, and a laboratory report, where the student completes an assessment outside of the laboratory, as two separate assessment types. However, there were a great deal of similarities between the responses of students for these two assessment types. Communication, in the form of written skills and independence, in the form of determination and dedication to get the work done on time accounted for 63.6% (laboratory) and 65.5% (laboratory report) of the total employability learning themes. Time management, which was placed in the independence employability theme, was a code that came up on numerous occasions for the laboratory work and laboratory report, as a skill being developed. This is consistent with work on the areas of high anxiety and low self-efficacy for students in the laboratory. At the start of the laboratory, it is common for students to feel anxious about getting the work completed on time, which tends to be associated with low self-efficacy (Rummey, Clemons, & Spagnoli, 2019). It was therefore encouraging to see how many students indicated that this was a motivational factor in getting the task completed and a strong element of employability learning. This was highlighted by the quotes below:

It [the laboratory] made me stick to my time management schedule. (Student 36, University 1, Bachelor of Biomedical Science)

Time management and being able to work on multiple things at once (Student 3, University 1, Bachelor of Science)

The main difference between these two laboratory assessments was that problem solving was stated nearly double the number of times as an employability theme for the laboratory assessment compared with the laboratory report assessment.

Group work

The group work assessment accounted for any assessment that students had described as involving working with other students for a co-created output. Communication again achieved the highest number of descriptions. The benefits of group work have been referenced in the published literature. For example, there are studies which include the positive outcomes of communication and teamwork skills as a result of students completing group assignments (Volkov & Volkov, 2015). There is also an established correlation between student satisfaction and group performance, which depends on group participation in their assignments (Springer et al., 1999). In the current study, we found that enjoyment was a common code in the identity section of the iASK tool for students working in a group assignment. The perceived enjoyment is often related to how students' expectations of the assignment and how much work they put in compared to their team members (Butt, 2017). Examples of relevant students' comments are below:

Prefer to work in a group. Work harder when partnered with friends. (Student 17, University 1, Bachelor of Biomedical Science)

I like to work in groups but have deadlines with clear expectations. (Student 19, University 1, Bachelor of Professional Engineering)

Organisation and leadership were two codes that were highlighted in the attributes section of the iASK tool, which again relates to the perception of the interactions between members in the group.

I am good with communication when others do not feel comfortable voicing their opinion, I try to take up the leadership role where possible and I am motivated by high marks (Student 20, University 1, Bachelor of Philosophy).

Dedicated to ensure cohesion within group, and responsibility for myself to finish work to same standard as those in the group. Clear that organisation is important to me. (Student 28, University 1, Bachelor of Biomedical Science)

The demonstrated student appetite for working in groups bodes well for their future workplace contexts, thus reinforcing assessment tasks as the opportunity to practice and develop the skills required for their future employment.

Essay

The essay had a greater spread of student-perceived employability learning with independence, information literacy, communication (in the form of written communication), and problem solving all accounting for between 16 to 24 per cent of all coded responses from students. Students, particularly at first-year, find meeting the standards of academic writing difficult (Aitken & Thompson, 2018; Sadler, 2010). It was encouraging that both information literacy, which involves the researching and sourcing of information, and problem solving, which involves developing ideas and adapting knowledge to the task in hand, featured prominently in the knowledge and skills being developed by writing an essay. This was most prominent in the knowledge and skills section of the iASK tool:

This was the first assessment I had done where I had to learn how to reference, which is good because a lot of my future assessments would require me to use this skill (Student 11, University 1, Bachelor of Professional Engineering).

Life-cycle assessment

The life-cycle assessment was the only assessment type that had specific employability themes made explicit in its assessment design. The assessment was part of an introduction to a professional engineering unit, which stated the importance of engineering in a global context and on the relevance to future careers. Moreover, there were specific employability learning outcomes detailed in the unit outline, such as communication skills, inclusive teamwork, problem-solving and self-directed learning. The life-cycle assessment had the lowest responses within the independence theme among all of the assessment types. The most prominent theme for the life-cycle assessment after communication was the 'other' category. This category included codes, such as self-awareness, creativity, curiosity, easy going and capability, which could not be aligned to any one of the other employability themes. After the other category, information literacy, organisation and problem solving were the three most common employability themes.

Exam-test-quizzes

The researchers grouped together any formal exam, test, or online quiz. Students hold examination and recall of knowledge in a test situation in high regard. For the exam-quiz-test assessment types, independence and problem solving are the most prominent employability learning themes. For example: 'I have the determination and drive. I will always complete a task regardless of the outcome' (Student 101, University 2, Bachelor of Professional Engineering).

Students also thought that these assessments helped develop their problem-solving skills with an acknowledgement of the time pressures that are involved in the study of the exam and completing the exam on time. A Bachelor of Biomedical Science noted that '[t]his assessment required a deep level of thinking and required me to apply my knowledge to things that weren't talked about much in classes (Student 100, University 1).

Oral presentations

Oral presentations were heavily populated with the communication and independence employability learning themes, which accounted for 52.8% of all the themes for that assessment type. Oral presentations had commonality to the life-cycle assessment because the other category featured higher than the other employability theme. Students believed that oral presentations encouraged their creativity. Students also emphasised the capacity of oral presentations to develop their oral communication skills, with one student commenting: 'I am creative and I work best when given some room for interpretation and allowed to have some creative freedom over my assessments' (Student 87, University 2, Bachelor of Philosophy).

Overall, the surprising outcome of the data was the wide variety of assessment types students nominated as enabling employability learning. Students identified specific skills developed by types of assessment (e.g., communication skills with oral presentations) and general, transferable skills such as those developing their employability skills of recall, motivation and working under pressure to get the task completed.

Discussion

The results of this empirical research establish a critical and direct processual link between learning, assessment, and employability, confirmed through analysed written reflections of students about their experiences. An overview of the results shows that students could use the iASK tool as a reflective exercise to provide broad lists of what they learned through assessment and that they believed would make them employable. The research therefore contributes to the emerging body of literature linking employability, reflection and articulation of employability learning (Reid et al., 2021). The research confirmed three major areas of employability learning that students associated with their assessments. These areas are communication, independence, and organisation.

Students identified communication, both written and oral, as being developed as knowledge gained and skills learnt through their assessments. Employers consistently rank both oral and written communication skills more highly than technical or discipline-based knowledge (Gray et al., 2005). Students perceived independence and organisation as being developed as an identity and attribute that they learnt through their assessments. This is an encouraging result as it implies that if students are taught about the link between assessment and employability then students can use their achievements from their assessments as evidence to support a job application or answer interview questions. This could be useful in addressing employers' perceptions that graduates lack necessary professional skills (Byrne et al., 2020).

The variety of different assessments that students used in their reflection on employability learning is also encouraging. This result indicates that employability skills such as communication or independence do not need to be explicitly assessed, which is notoriously difficult (Sambell et al., 2021). Students need to be able to find the value in their assessments and if a particular skill is not linked to a grade, sometimes that value can diminish. However, the use of a reflective strategy, such as the one outlined in this paper, can provide students with an opportunity to increase the perceived value of assessment on their employability.

Although the above results are encouraging, there are two crucial employability areas that students are not associating with assessment tasks, namely global citizenship, and critical thinking. The importance of global citizenship cannot be ignored (Palacios-Hidalgo et al., 2021). Many students consider working for a multi-national corporation or in work abroad. Australia, especially being positioned within a rapidly growing and dominating south-east Asian market, would want graduates to be able to work and actively and engage with their neighbours on a cultural, economic and political

level (Schech et al., 2017). Many researchers and academics have identified the importance of developing employability skills in the first-year of university which can lead to increased engagement and learning (Hanna et al., 2015; Harris-Reeves & Mahoney, 2017; Milliken et al., 2021). Ignoring global citizenship in assessments at first-year level could delay the engagement required in this important area of employability.

Like global citizenship, critical thinking was a key skill that students did not link to the assessments on which they chose to reflect. Aligned with Bloom's Taxonomy (Bloom et al., 1956; Forbes, 2018), critical thinking is at a higher-level order of thinking. At the first-year level, it is unsurprising that most assessments do not include the explicit development of this highly regarded employability skill. However, including critical thinking into the first-year curriculum can have the added benefit of allowing students to develop a new perspective to knowledge (Wass et al., 2011) and engage with the subject material (David & Brown, 2012).

Over half of the students (55%) responding to the survey indicated that they were from a science discipline. Many science academics believe that critical thinking is a generic skill that is developed and assessed within the majority of their units (Sarkar et al., 2020). However, very few of the students associated critical thinking as being developed within their assessments at a first-year level. The results from this study once again highlight the disparity that exists between the importance of assessments from the view of academics and students (Kinash, Crane, Judd, & Knight, 2016). Nearly a third of assessments chosen by students (30%) were of a laboratory assessment or a laboratory report. Due to the majority of laboratory assessment work characterised as so-called 'cook-book style recipe formats,' it is unsurprising that critical thinking is not being developed by students within these assessments (Clark et al., 2016). Moreover, the amount of learning in general from expository style laboratories has been questioned for many years (Kirschner, 1992). Only relatively recently has the chemistry education laboratory research, for example, moved to developing more augmentation and critical thinking style laboratories (Walker et al., 2011). The research reported here supports the recommendation that more open-ended, less instructional style of laboratory assessment be introduced at an earlier stage of university if these important skills that employers find important are to be efficaciously developed.

Conclusion

The work presented in this paper firstly described the development of the iASK reflective tool which students could use to make the link between employability and current assessment practices. After students watched a short online video, they were able to complete the iASK tool and reflect on the employability learning they had gained through their chosen assessment.

Once the objective of assessment as a vehicle of employability learning was made transparent to students, they were able to report the nuances of this approach. At the intersection between identity and attributes the most prominent theme was independence. At the intersection between skills and knowledge communication was the theme detailed by many of the students involved in this study. This indicates that the students participating in this research appear to believe that completing their assessment tasks provides an opportunity for them to develop their ability to drive their employability and their future workplace behaviours. A surprising outcome was the variety of the assessment types reported by students.

The research has practical implications for university educators at the intersection of learning design (through assessment) and employability development. As such, the development of this reflective tool and research derived four overall recommendations.

- 1) Explicitly make students aware of the connection between employability, learning and assessment, perhaps using a tool such as iASK for students to reflect on and record this relationship.
- 2) Encourage students to use assessment both as an opportunity to practice employability skills through doing the assessment tasks (assessment as process) and to use the completed assessment tasks as evidence of employability skill development in their employment applications and interviews (assessment as products).
- 3) Use a variety of assessment types and select/match the assessment types to the employability learning relevant and appropriate to the discipline/s and industry/ies.
- 4) In designing the specific assessment task, proactively align the instructions and desired outcomes with the intended employability skill development.

Limitations of the research were a sample size which did not allow comparison and contrast between students in different disciplines and the bounded condition of only first-year students. Future research is recommended to probe, for example, the differences between identified iASK responses from students in Science, Technology, Engineering and Medicine (STEM) versus Humanities, Arts and Social Science (HASS) disciplines and between first and final year students.

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The authors report there are no competing interests to declare.

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