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Embedding resources into digital assessment rubrics: Bringing academic support directly to students

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Students are increasingly entering higher education via diverse pathways and with diverse levels of academic preparedness (Ashton-Hay & Doncaster, 2021; Edwards et al., 2021; Dooey and Grellier, 2020; Beatty et al., 2014; Goldingay et al., 2014). With many academics believing their role is to teach "content" rather than academic skill development, responsibility for the development of academic literacies needed by students falls on the student or Academic Language and Learning (ALL) units (Huijser et al., 2008; Gunn et al., 2011). As such, embedding academic resources and literacies into topics has become common practice among ALL units, resulting in improvements in student learning (Hebdon, 2015; Maldoni 2018). While various embedding models have been adopted in universities (Black & Rechter, 2013; De Maio & Desierto, 2016; Maldoni 2017; Maldoni & Lear, 2016), few, if any, focus on embedding of ALL resources into assessment rubrics. Here we describe a model for embedding resources directly into assessment rubrics and how this service aims to support students at a critical moment in their studies, contextualise academic skills within units of study, and reduce generic queries to subject staff. Further, this model helps increase the visibility of ALL services and identify resource use and quality. In addition, the gathered data allows us to report back to academics on what academic skills they are asking students to demonstrate, prompting reflection on assessment design. At Flinders University, we are piloting this model as a strategy to reach all learners and support student success. As of August 2021, we have embedded our academic skills resources into assessment rubrics for 70+ units of study university-wide, collecting data and feedback on usage. Future findings should offer possibilities for adoption, reflection, and further research across higher education institutions and ALL units.

Key Words: embedding, assessment, rubrics, academic literacies, academic skills, integrated

1. Introduction

It is broadly accepted that the acquisition of academic skills and literacies, such as critical thinking, writing, and reading, information and digital literacy, and time and self-management skills, play an important role in students' successful transition to a university setting (Munn & Small, 2017). However, as a result of Australian Government efforts to increase tertiary participation (Ashton-Hay & Doncaster, 2021; Edwards et al., 2021; Pitman, 2017), students are increasingly

entering university from diverse pathways and with diverse levels of academic preparedness (Beatty et al., 2014; Bohemia et al., 2007; Goldingay et al., 2014), with many students underprepared and underequipped to succeed in their studies. Although universities list communication skills in their graduate attributes, there is also the perception that many students graduate without these necessary skills (Edwards et al., 2021; Perry, 2020; Arkoudis, 2014). As it remains unsettled as to who has responsibility for developing students' academic skills over the course of their degree, the corollary effects, then, of not explicitly teaching students how to communicate in an academic context may have implications for graduate outcomes and employability due to the gap between university and employer perceptions of graduate literacy and communication skills (Arkoudis, 2014).

Many classroom academics assume that students have the analytical, reading, and writing skills necessary for tertiary study and that the development of these skills is either implicit throughout their degree, or is the responsibility of the student (Gunn et al., 2011; Huijser et al., 2008; Star & Hammer, 2008). It is not guaranteed, however, that students will develop their academic literacy skills through "osmosis", nor do many college academics have the time or expertise to develop these skills in class (Dunworth, 2013). As a response, to improve this knowledge gap and curb attrition, universities have created units responsible for designing and delivering resources that help improve these skills: Academic Language and Learning (ALL) units.

This paper describes a model for embedding academic skills directly into assessment rubrics and, as such, contributes to growing initiatives that aim to deliver necessary academic literacies to students in a contextualised, integrated, and just-in-time approach. The model, developed by the Student Learning Support Service (SLSS), an ALL unit within the Centre for Innovation in Learning and Teaching (CILT) at Flinders University, embeds links to PDF and video resources about specific academic skills, such as argument, paraphrasing, or setting objectives, into digital assessment rubrics provided by course coordinators (we use "course" here to refer to a unit of study). This paper reviews current embedding models, describes the initiative taken by the SLSS, and discusses the implications and future directions of the service.

2. Further background

Australian universities tend to have support units that focus on delivering academic skills support. These services range from teaching programs to drop-in guided study sessions and more generalised academic skill development. However, students are often deterred from engaging with these services due to a lack of awareness about how to access support and the "extra hassle" of seeking it out (Goldingay et al., 2014), the stigma associated with ALL support services and identifying as "at risk" (Goldingay et al., 2014; Maldoni, 2018), and external time constraints that mean they do not prioritise long-term skill development over immediate measurable benefits (Beatty et al. 2014). As such, ALL units face the challenge of shifting away from being seen as a remedial service on the margins of the university (Ashton-Hay & Doncaster, 2021; Huijser et al., 2008) to proactively engaging with students, as well as how to make their learning resources and services accessible to students before they reach a critical point in their studies (Maldoni & Lear 2016).

Research in academic language and learning suggests that embedding academic literacies support and resources within a student's rhythm of study can have a positive impact on learning and retention (Maldoni, 2018; Arkoudis et al., 2014), students' sense of confidence in their academic capabilities (Hillege, et. al, 2014; Rae & Hunn, 2015), and in managing the expectations of academic skills between students and academics (Goldingay et al., 2014). Classroom academics, however, are time-poor and often believe their role is to teach content rather than academic literacies, so the extra effort associated with embedding academic skills development in their courses can be a deterrent for them to do so (Gunn et al., 2011; Huijser et al., 2008; Star & Hammer, 2008). As such, embedding academic resources and literacies into topics has become a common

practice among ALL units, resulting in improvements in student learning (Hebdon, 2015; Maldoni, 2018).

3. Embedding service

3.1. Review of current embedding models

Current embedding models fall within one of three formats: (a) the creation of generic workshops delivered outside the normal course schedule where students are encouraged to attend, and/or the creation of resource libraries for students to self-serve (the *adjunct* model); (b) discipline-tailored workshops or resources co-created between subject staff and learning advisors that sit within a program of study that students must attend or engage with and where they are often assessed for competency (the *integrated* model); and (c) the *embedded* model, where academic literacies and skills are embedded within the curriculum to be taught by subject staff (Maldoni & Lear, 2016). Extensions of the embedded model include those that are embedded and integrated, and embedded, integrated and team taught. These models are successful to varying degrees; however, there are challenges that arise within all, including that existing silos are maintained, students must actively seek support services, and academic skills are decontextualised from their disciplines (Table 1).

Table 1. Current approaches to embedding skills and the common challenges associated with each model including the one presented in this paper.

Model	Challenges
Adjunct The creation of generic workshops delivered outside the normal course schedule where students are encouraged to attend, and/or the creation of resource libraries for students to self-serve.	These models are ineffective because they address surface-level challenges and are external to discipline-specific discourses and practices (Murray & Nallaya, 2016; Maldoni & Lear, 2016; Hunter & Tse, 2013; Wingate, 2006). Seen as optional, "add-on" or an additional burden of work for students and academic staff. Support remains decontextualized from topic-specific content and this results low motivation to engage and poor uptake of offered services (Fowler & Zimitat, 2008; Gunn et al., 2011; Goldingay et al., 2014; Munn & Small, 2017; Wingate, 2006; Wingate, et al., 2011; Hooley et al., 2010; Hunter & Tse, 2013).
Integrated Discipline-tailored workshops or resources are co-created between subject staff and learning advisors that sit within a program of study that students have to attend or engage with, and where they are often assessed for competency.	Despite collaboration with academic staff, the role of ALL unit is still marginal, maintaining existing silos between topic-specific content and broader academic skill development (Maldoni & Lear, 2016). Sustainability and scalability issues as program expands (Rae et al., 2019).
Embedded Academic literacies and skills are embedded within the curriculum to be taught by subject staff.	The level of collaboration needed for compliance and effective implementation of embedded approach among academic and ALL unit staff is difficult to guarantee (Murray & Nallaya, 2016; Mostert & Townsend, 2018; McWilliams & Allan, 2014; Clughen & Connell, 2012). Resource-intensive, costly and complex (Maldoni & Lear, 2016; Wingate, 2006).

Table 1 continued

Model	Challenges
Embedded and integrated Learning advisors and subject staff co-design and co-deliver presentations in-class.	Consistent, continual collaboration and buy-in from key stakeholders is a hurdle (Ndesi et al., 2016; Brooman-Jones et al., 2011). Optional activities and additional support options for students to up-take are declined due to competing priorities in high-pressure university environment (Beatty et al., 2014).
Embedded, integrated and team-taught Inter-faculty collaboration between subject staff and learning advisors, with content taught by learning advisors as a regular weekly class within a larger program of study.	Time-consuming approach that requires high levels of collaboration and compromise (Maldoni, 2017).
Assessment-embedded (this paper) Academic resources are matched to assessment criteria and embedded as hyperlinks within a rubric.	Recognised challenges include ensuring insight sharing and feedback loops with academics are maintained; contextualising within the larger piece of assessment (e.g., an essay) what might be seen as too abstract a resource when taken in isolation (e.g., ensuring a student understands how a well-structured body paragraph is an aspect relevant to their broader piece of assessment); ensuring resources are skill-specific and succinct.

3.2. Rationale for embedding links to ALL development resources into assessment rubrics

While various embedding models have been adopted in universities, few, if any, focus on directly embedding of ALL resources into assessment rubrics. The SLSS is piloting this new model of embedding as a strategy to reach all learners and support student success and independent learning. The objectives of the model are: to bring our support and resources to students in a just-in-time manner; to be more adaptive to the online learning space; to better integrate and contextualise academic skills within disciplines; and to help teachers help their students by prompting them to reflect on the skills they are asking students to demonstrate in their assessments and how these skills align with the course learning objectives.

Our embedding method has the potential to provide just-in-time support to students, particularly as we know that students, especially first-years, are assessment-driven, and that assessments are where they place most of their focus during semester and where they experience high levels of stress about their competencies (Hooper & Bartlett, 2011). In addition, online modes of course delivery require engagement with the e-learning environment (Rae et al. 2019), and, as many assessment rubrics now exist digitally, this presents the opportunity to collaborate and embed resources directly. By mapping skills onto specific learning and assessment outcomes, resources are better integrated and contextualised within disciplines rather than being seen as an "add-on" (Rae et al., 2019) in the form of a generic skills workshop. Instead, students can see direct relevance to their academic success.

Overall, the model aims to reduce student accessibility barriers, bridge the knowledge gap between students and their expectations, and improve students' self-confidence and self-efficacy, among other benefits. The novelty of our approach suggests an urgency to study its impact and implications on student success and retention, and course coordinators' perception of its use and suitability in the classroom environment. Embedding resources coupled with learning analytics

and usage of online platforms can help universities understand how students engage with information and how to improve their services (Brennan et al. 2018, Munguia and Brennan, 2020).

3.3. Embedding into assessment model

The key foundational element of our embedding model is the deconstruction of broadly recognised skills into the smallest possible unit we can identify, and we refer to these as microskills. For example, a commonly needed skill may be academic writing, and this skill may be presented to students as workshop sessions, lectures, or a series of PDFs or videos. To minimise the burden of skill acquisition in our just-in-time model, and to simplify the value of each component within "academic writing", we have deconstructed the broad skills into microskills such as "arguments" and "topic sentences", for example. These microskills have the benefit of being succinct, reducing the potential for students' disengagement and increasing focus on what is required in a particular assessment. The two challenges microskills present is ensuring there is an opportunity to thread and create strong linkages between microskills, and to contextualise skills against broader products such as essays or lab reports. The rubric itself can provide some of this context, as it explicitly maps the skills and content being assessed in the criteria.

Our embedding into assessment model (Figure 1) solves many challenges faced by current academic skills development models. The SLSS has created a suite of resources that are available to students in PDF and video format. These resources cover foundational academic skills identified as being necessary across disciplines at university, and they are intentionally pitched at a generic, undergraduate level to both scaffold skill development from the beginning of a degree and demonstrate how academic skills are transferrable across disciplines. By embedding these resources directly into assessment rubrics, we address challenges associated with embedding more broadly. Rather than waiting for students to discover the resources, embedding into assessment rubrics allows us to bring our resources directly to students at a critical moment in their studies. Our approach minimises additional workload for academic staff, thus encouraging buy-in. By embedding into rubrics, we contextualise academic skills within a discipline's assessment criteria and make these skills relevant and more integral to students' preparation of assignments. Given the resources have already been created and only require embedding, this approach is efficient in terms of time and cost. And finally, through embedding into assessment, we place our service squarely within a discipline rather than marginal to it.
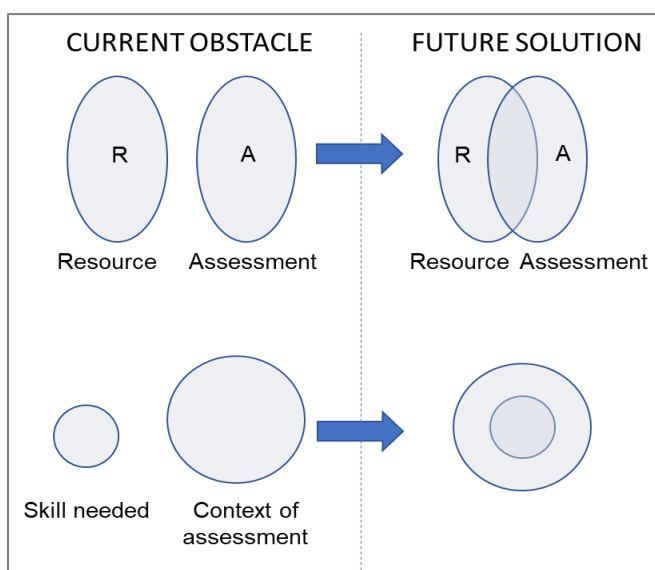

Figure 1. Two current obstacles associated with learning support services and how embedding into assessments can remove them. Often, resources associated with an academic skill are isolated from the assessments students are expected to do (top). Such isolation creates an expectation that the student will go find the resource if they need to understand a skill for an assessment. The embedding into assessments solution places the resource right next to the assessment piece where it is needed and is easily found by students. Further, assessment instructions may not explain the academic skills needed to perform the assessment as instructions often focus on discipline-specific content (bottom). By embedding into assessments, we unpack the relationship between an academic skill (which often is explained in abstract terms) with a subject (which focuses on content). Finally, this model creates an opportunity for academics to reflect on their expectations for their students.

Embedding into assessment is a three-step process:

Step 1 Embedding. A course coordinator requests for resource embedding into an assessment's instructions or rubric. We return the rubric to the course coordinator for review (Figure 2), and they upload the rubrics with embedded resources to their course page on the Learning Management System. We also provide a short student-facing video that explains how embedding works. Every embedded resource is tracked, allowing us to look at commonalities across rubrics, courses, year levels, and disciplines. We have primarily targeted large first-year cohorts across all Colleges and disciplines, to demonstrate that the resources, and indeed the academic skills they cover, have broad application. For example, while there may be disciplinary differences between, say, the average length of an introduction, the foundations of a good introduction are consistent (students must introduce the topic, provide background and a thesis statement, and outline the structure of their paper).

Assessment criteria	Excellent	Good	Satisfactory	Unsatisfactory
Introduction Introductions	Clearly and strongly articulates context, thesis statement and essay outline	The context and significance of the argument are described. Key points are summarised and their relevance to the argument is indicated. The thesis statement defines the scope and steers the direction of the argument.	The central theme and its relevance for argumentation are stated. Key points of the argument are summarised and their relevance to the argument is implied. A broad opinion about the essay topic is stated and the argument focus is unclear.	The central theme is stated with a nil or underdeveloped indication of its relevance for argumentation. The key points are listed without logical connection to the argument. A position on the essay topic is not made clear.
Body Paragraphs and Argument Paragraphs Writing an argument What is evidence?	Each paragraph is well developed with strong topic sentence. Evidence is selected and analysed with logical connections to key points of the argument. The key points are integrated yielding a persuasive evidence-based narrative in support of the position.	Each paragraph is developed with a topic sentence and central idea. Evidence is described with relevance to key points of the argument.	Most paragraphs contain a topic sentence and central theme. The relevance and logical connection of the key points to the developing argument is unclear in writing.	Topic sentences missing or no central idea present. The evidence selected is not relevant to the argument. The key points are not summarised or are underdeveloped.
Conclusion Conclusions	Excellent synthesis of key points in relation to thesis statement. Implications of the argument presented are stated and justified with insight.	Summary of key points in relation to thesis. Implications are stated with implied relevance to the argument.	Adequate summary of key points with restatement of thesis. Possible implications of the argument are stated but their relevance is unclear.	Missing or weak conclusion which does not restate thesis. Possible implications of the argument are not stated or are underdeveloped.
Clarity of written expression. Writing style Editing and proofreading	Written expression is unambiguous. The expression of ideas in writing are clear and obvious to the reader through correct spelling, grammar and punctuation.	The expression of ideas in writing are evident to, yet open to interpretation by the reader due to errors in spelling, grammar, or punctuation.	Written expression is developing. The expression of ideas is made unclear to the reader through spelling, grammar, or punctuation errors.	The expression of ideas is unclear to the reader through substantial spelling, grammar, or punctuation errors.
Referencing conventions. APA 7 Referencing Paraphrasing and quoting	Referencing style is consistent and strictly follows the APA 7th Edition style guide.	Referencing style is consistent but does not strictly follow the APA 7th Edition style guide.	Referencing is beginning but is inconsistent or incomplete.	There are no or insufficient academic sources presented in a bibliographic form.
				Total

Figure 2. Example of an embedded rubric. For a given component of a rubric (a row), there may be a coloured box linking to the appropriate resource. Different colours can represent different types of skills.

Step 2 Resource management. When embedding resources onto a rubric or assessment, we keep track of course details such as delivery semester and years and the number and type of resources embedded into each assessment. We treat each rubric as a sample and analyses can be at the level of an assessment (i.e., to understand number and type of skills that an assessment contains), at the level of a course (i.e., for comparisons across courses) and at the level of a discipline (i.e., to compare skills between schools or colleges). In some courses we may request feedback from students to know whether accessed resources were helpful, providing input on how to improve resources. We also keep track of resource downloads and timestamps to determine which rubric is directing engagement to which resources. The insights gathered from this feedback and data will be published in a separate paper.

Step 3 Analysis and feedback to course coordinators. The information gathered above gets presented to academics to reflect on which skills tend to be common across disciplines, which academic skills tend to be unique to specific disciplines, or which are simply rare. This approach is useful as it helps mitigate the large number of requests for resource creation, as sometimes different academics refer to the same resource with minimal semantic differences. When aggregating the number of resources across the university, we can quantify the average number of academic skills that are required per assessment. Ultimately, when courses belong to similar programs, we can provide insights to program coordinators about frequency and usage of skills longitudinally. We also analyse resource access by students, and, in time, we will be able to identify the rhythm of utilisation relative to deadlines to inform on how to improve student learning support (Munguia and Brennan 2020, Munguia et al. 2020, Munguia 2020).

4. Implications of embedding into assessments

We assume that when academic skills resources and assessments are siloed, or when there is a spatial gap between the two (e.g. two different locations within the LMS), students have difficulty relating the resource for an academic skill to the assessment piece (Figure 1). Therefore, our driving hypothesis is that the closer a resource is positioned to an assessment, the easier it is to contextualise a skill against the expected learning outcomes, and the more useful it will be for the student.

Why embed resources directly on to an assessment? We believe there are three good reasons and one potential risk. First, removing isolating barriers: often the resource repository (e.g., a location within the LMS or a website) is not in close proximity to an assessment (which often lives within a specific location of the LMS, and can vary from course to course). The main reason behind this isolation is driven by the fact that academic resources are created and maintained by ALL units, while a course's LMS repository is owned by the academic in charge of the course. We know students focus on their assessment pieces; therefore, this solution supports students as they are working on the assessment and removes the unintended expectation that students can quickly find the resources they need to understand the required academic skills.

Second, assessment instructions often focus on discipline-specific content and academics may not necessarily translate an academic skill to its discipline as there may be expectations that students already have mastered such academic skills. Therefore, rubrics and assessment instructions may not unpack the types of skills needed to produce the assessment. By embedding skills into assessments, third-party explanations (e.g., from ALL units) can help connect a skill to the assessment and explain how to develop the skill as students perform the assessment. This connection helps unpack the relationship of an academic skill (which often is explained in abstract terms) with a subject (which focuses on content). Rubrics (as per Fig 2.) may lack sufficient space to unpack how to achieve the expectations and their content instead focuses on the quality of the task, not how to do it. Therefore, the two reasons above may also reduce generic queries on the assessment from students to lecturers.

Finally, the third positive outcome arising from this model is the creation of an opportunity for pedagogical reflection. Because the embedding piece is done by a service external to the lecturing team, it creates an opportunity for constructive reflection on whether a rubric is designed as intended.

There is a persistent risk associated with resources created by ALL units, but we believe that our approach actually helps resolve it or at least manage it with ease. The risk is that if academic resources are not succinct and easy to understand, the ALL services may unintentionally burden students by adding information to be digested and absorbed, in addition to the expected activities in a course. However, as per our rubric example (Figure 2), each of our resources focuses on a microskill, such as how to construct arguments, and such a skill can be clearly and succinctly articulated in a brief resource document, reducing the potential burden created by the resource.

From a central service perspective, embedding into assessments helps promote the resources to students and academics. And by keeping track of resource use across subjects and LMS locations, the service can understand areas of activity and potential subjects in need of resources and obtain feedback on resource quality. We can also better understand how students use university resources and how students learn and practice the use of academic skills. By focusing on an assessment, other university teams (e.g., Careers, Library) may join and further remove the institutional silos that impact the student journey.

5. Conclusion

Here we present the logic and approach that Flinders University has followed to resolve a ubiquitous problem present at most universities and ALL support teams. Once we have gathered enough data, we will analyse the impact of our embedding model and present our findings in a separate paper; however, we can mention that there was ease of uptake by academics relying on trailblazers and evidence of success and appreciation by students. One academic said that he had a great experience working with the embedding into assessment team and, although initially sceptical and concerned we might try and critique or change his topics and assessments, he found the process seamless and supportive of his students. This feedback attests to how this service can resolve challenges faced by current models of embedding. Embedding resources into assessment rubrics brings support to students at a critical moment in their studies to contextualise academic skills within their course, may reduce generic queries to subject staff who are already time-poor, increases visibility of the SLSS, and allows us to identify resource use and their quality. This service continues to expand and gather data, and our findings should offer possibilities for adoption, reflection, and further research across higher education institutions and ALL units.

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