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# A framework to embed communication skills across the curriculum: A design-based research approach

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A framework to embed communication skills across the curriculum: A design-based research approach

## Introduction

There is widespread recognition that universities are now delivering higher education to diverse student populations with very different needs and aspirations from the more traditional cohorts of the past (Nelson & Kift, 2005). In order to prepare students for a broad range of employment opportunities, universities are also fostering the development of 'graduate attributes' or 'essential learning outcomes', in addition to content knowledge and disciplinary expertise (Oliver, 2015). While lists of graduate attributes may vary, certain skills are invariably listed, including communication skills (Institute for Teaching and Learning, 2015). The ability to communicate has been consistently identified by employers as one of the most essential graduate attributes. Indeed, according to the Graduate Careers Australia (2014, p.27), interpersonal and communication skills (written and oral) have been consistently chosen as the top key selection criteria by employers in Australia.

There is also a growing consensus that the development of communications skills (encompassing academic literacy and English language proficiency) occurs most effectively in the context of disciplinary study (Arkoudis & Starfield, 2007) and that communication skills need to be embedded in the curriculum. However, there is also recognition of the challenges of achieving this (Arkoudis, 2014). As Wingate (2006) and others (Clanchy & Ballard, 1995; Moore & Hough, 2005) have pointed out, communication skills tend to be treated as a 'bolt-on', extra-curricula study skill, rather than as an essential aspect of all academic and professional work in disciplinary contexts and fields of employment. In fact, effective, collaborative and explicit embedding of the teaching and assessment of communication skills (and other generic skills or graduate attributes) can be seen as a 'wicked problem' in education. While these skills and attributes are necessarily implicated in all academic work, their development is often tacitly assumed (Jacobs, 2007).

This paper reports on a project to develop a university-wide *Framework* to embed the teaching, learning and assessment of communication skills in curricula at Murdoch University. The Framework, which was developed by academic and professional staff at the Centre for University Teaching and Learning (CUTL), aims to support both staff and students through an integrated set of services and resources intended to develop communication skills within discipline-based courses. The project follows a design-based research approach, and has deliberately built on initiatives at other universities and best practice reported in the literature. This paper reports on work in progress, following the first two stages of design-based research: analysis and exploration, and design and construction (Reeves & McKenney, 2013). As well as establishing a systematic, campus-wide approach to the development of communication skills at the university, the project has generated design principles that can be applied at other universities.

## Communication skills in higher education

There are currently a range of drivers for developing communication skills as a key graduate attribute. In addition to employer surveys, communication and literacy have also been highlighted as professional requirements in a range of fields, including education, law and health. They also feature prominently in higher education standards such as Australian Qualifications Framework (AQF) learning outcomes (AQF, n.d.) and the Tertiary Education Quality and Standards Agency (TEQSA) threshold standards (TEQSA, n.d.). AQF learning outcomes identify communication skills as core skills alongside cognitive and technical skills. TEQSA's threshold standards specifically mention English language proficiency as a graduate attribute to be developed. As suggested by Kift (2014), converging concerns about standards in areas such as a literacy and

English language proficiency present ‘a perfect storm’ for promoting the development of communication skills within the curriculum.

In fact, communication skills have emerged as key elements in 21st Century curricula. While there are a range of other essential learning outcomes or graduate attributes, such as critical and creative thinking, quantitative and information literacy, and teamwork and problem-solving (AACU, 2015), the development of these arguably depends on sound communication skills (Barrett-Lennard, Chalmers & Longnecker, 2011; Finley & Rhodes, 2013). Indeed, the development of academic communication skills has been explicitly incorporated into international strategic curriculum change (Blackmore & Kandiko, 2012). Curriculum renewal projects at a number of universities in Australia and elsewhere have placed communication skills or academic literacy at the level of core priorities (UWA, 2009; King's Warwick Project, 2010).

There has also been a broader move in Australian universities towards the embedding of the teaching, learning and assessment of communication skills within the curriculum. There is increasing recognition that communication skills need to be taught and learned within the meaningful context of discipline-based learning in order to accommodate particular disciplinary priorities and student needs. TEQSA's English language standards advocate ‘contextualisation within disciplines and integration of language development across the curriculum’ (AUQA, 2012, p.8), as well as ‘embedding language development through curriculum design and assessment’ (AUQA, 2012, p.8). According to Arkoudis (2014), best practice principles include the following:

- communication skills should be promoted as a core competency
- communication skills strategies should not only provide support for international students to develop their English language proficiency, but support all students in developing the essential skills necessary for success, including writing, speaking, reading and interpersonal skills.
- communication skills development should be discipline-specific and ensure both readiness for study and engagement with disciplinary learning.

Embedding communication skills in course curricula, pedagogical practices and assessments is essential to putting these principles into practice, as is the development of the staff capabilities to do so.

In line with such recommendations, a number of Australian universities have introduced campus-wide systematic approaches to the development of communication and related skills (for examples, Lynch & Quantrill, n.d.; Barrett-Lennard, Chalmers & Longnecker, 2011). A key feature of these approaches is collaboration between disciplinary academics and academic language and learning (ALL) practitioners with general expertise in the teaching and learning of communication skills. Many examples of successful collaborations can be found in the literature (Dunworth & Briguglio, 2010; Harris & Ashton, 2011; Chanock et al, 2012; Thies, 2012; McWilliams & Allan, 2014).

However, as well as the need for embedded approaches, the challenges of implementing them have also been recognised (Wingate, 2006). Apart from issues of funding and resources, a major challenge relates to the process of collaboration itself and difficulties related to differences in teaching philosophies, power relations and institutional priorities (Jacobs, 2005, 2006; Arkoudis and Starfield, 2007). In fact, the difficulties associated with embedded approaches warrants their description as ‘wicked problems’. The term ‘wicked problem’ describes real world problems that are complex and require multiple perspectives to resolve. Several researchers have identified wicked problems in higher education, including ‘quality’ (Kraus, 2012) and the assessment of

'soft' or 'wicked' competencies (Knight, 2007). Since effective collaboration between ALL practitioners and disciplinary lecturers to embed communication skills is similarly complex, it is also usefully considered as an educational wicked problem. A concern to address the complexities of this problem has characterised the current project from the outset. Therefore, the project has employed the method of design-based research.

## A design-based research approach

Design-based research is an approach to educational research that aims to create practical solutions to educational problems by drawing on existing practices and expertise, generating design principles and interventions, and testing and refining these through further practice (Van den Akker, 1999; Reeves, 2005; 2006). Reeves, Herrington and Oliver (2005, p. 103) presented the following characteristics of design research:

- A focus on broad-based, complex problems critical to higher education
- The integration of known and hypothetical design principles with technological affordances to render plausible solutions to these complex problems
- Rigorous and reflective inquiry to test and refine innovative learning environments as well as to reveal new design principles
- Long-term engagement involving continual refinement of protocols and questions
- Intensive collaboration among researchers and practitioners
- A commitment to theory construction and explanation while solving real-world problems

Design-based research 'combines seeking practical solutions to classroom problems with the search for design knowledge that others may apply' (Reeves et al, 2005, p. 107). A distinguishing characteristic of design-based research is the goal of producing explicit heuristics or guidelines. Reeves and McKenney (2013, p. 2) noted that although 'the simultaneous pursuit of practical innovation and theory building is extremely ambitious and difficult', it can result in the professional development of all involved.

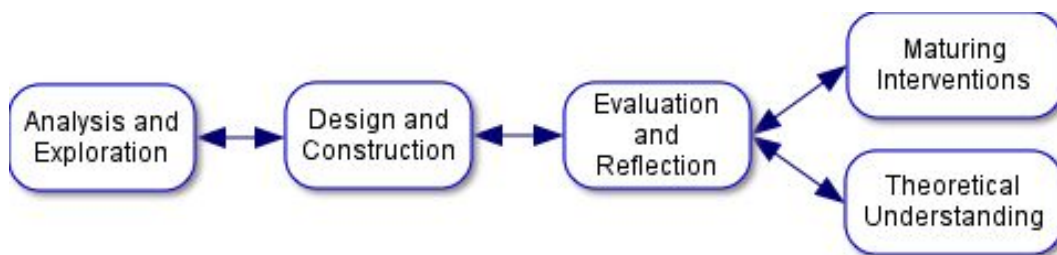


Figure 1: The design-based research process (based on Reeves & McKenney, 2013, p. 596)

Figure 1 shows the phases in the design-based research process. The first is an analysis and exploration phase in which researchers collaborate with practitioners, as well as investigate best practices and key theories, to gain an understanding of the problem. The second phase is the design and construction of practical solutions to the problem, as well as the creation of 'design principles'. These are then evaluated and reflected upon in the third phase, leading to further development of both the practical intervention and theoretical understandings.

One of the key characteristics of design-based research is collaboration between researchers and practitioners, although it is often the case that the researchers are also practitioners themselves. As

in the current project, other stakeholders may also be involved at different levels. Therefore, before describing the phases of the research as they have unfolded, it is useful to outline these roles and relationships. In the role of practitioners in the teaching and learning of communication skills, the CUTL team members have developed materials and delivered lectures on particular skills. Much of the work traditionally done by CUTL academics, which includes the development and delivery of enabling units and workshops for delivery to all students or specific cohorts (such as international students), has been largely concerned with the development of communication skills. General workshop topics have included reading and note-making, strategies for writing essays, writing reports in the sciences, grammar and punctuation, oral presentations. Collaborations at the unit level have involved the adaptation of these activities and resources developed for general student cohorts, for use in disciplinary contexts. As designers, the CUTL team members have developed the activities and resources that make up the practical components of the Framework to be described in detail below. Finally, team members have also acted as researchers to identify best practice and explore theoretical perspectives with the purpose of generating design principles to inform their own and other's practice and to feed back into theoretical understandings themselves.

## The analysis and exploration phase

Following the first phase of design-based research, the project began with analysis and exploration of the problem of embedding the teaching, learning and assessment of communication skills in university curricula. At a practical level, the initial stages of the project involved collaboration with disciplinary academics, at various levels, to explore this problem. Initially, this was confined to the School of Education and was largely focused on the development of literacy for students in the School of Education. Although the collaboration was also largely focused at the unit level, its scope was expanded through the involvement of the Associate Dean Learning and Teaching (ADLT) in the School. One result was the collaborative development of a literacy rubric, proposed for use at the School level and developed in response to the need for a common language to inform the development and assessment of literacy across the curriculum.

In terms of research, the initial stages of the project have involved a range of inquiries aimed at understanding the problem and working towards practical solutions and design principles. These have included review of the work of disciplinary practitioners in successful units at the university and review of best practice at other universities. Examples are the University of Western Australia's (UWA) *Communication Skills Framework*, which provides guidelines for developing institutional communication skills strategies (Barrett-Lennard, Chalmers & Longnecker, 2011) and the Royal Melbourne Institute of Technology's (RMIT) *Rubrics for assessing academic language and writing* (RMIT Study and Learning Centre, 2012), which provides examples of assessment rubrics that can be developed for particular assignments, linked to online support resources for students on particular aspects of writing. Inquiries have also included review of the literature, including Office of Learning and Teaching (OLT) good practice reports, professional publications and websites. Developing understandings have been presented at various symposia and conferences with a view to gaining feedback from practitioners at other universities (Veitch, Johnson & Mansfield, 2013; Johnson & Veitch, 2014; Johnson, Veitch & Dewiyanti, 2015).

These grassroots collaborations led to greater scope for collaboration between CUTL and university academics to enhance staff capabilities to embed and assess communication skills across the curriculum. A major characteristic of the initial consultation phase for the project has become representation to and consultation with key academics across the schools, particularly the ADLTs, with the aim of gaining support for the project. For CUTL staff, this has involved

advocacy of the importance of communication skills and the need for an embedded approach involving academic staff development, and presentation of best practices at other universities. Subsequent representations have led to higher level institutional support, including support from the Pro Vice Chancellor Learning and Teaching, the university's Learning and Teaching Committee, and the Academic Council. Indeed, gaining official institutional support has been essential for the development of the project.

In addition, a key strategy for the project has been to connect with the university's curriculum renewal process. Within the new curriculum, all degrees contain a set of compulsory research and breadth units that run alongside core content units and that increase in complexity over the degree. Communication skills are implicitly embedded in the breadth and research units' principles and guidelines, as is the progressive development of these skills across each degree. These skills include summarising arguments, reading critically, interpersonal skills, evaluating disciplinary perspectives, and integrating diverse perspectives in written and oral forms. The new curriculum provides a framework for the progressive development of communication skills and their embedding in curricula, pedagogy and assessment.

While Murdoch's new curriculum has offered an opportunity to design and implement a Communication Skills Framework, the challenges faced by any university in such an endeavour remain. These include effectively linking with institutional goals and strategies, making implicit disciplinary discourses and understandings about communication more explicit; engaging disciplinary staff who may lack the expertise, confidence, time or willingness to participate; sustaining a collaborative approach with limited human resources (particularly in terms of teaching and learning staff), and accommodating the needs and goals of different disciplines.

## The design phase

Following the analysis and exploration phase, the design phase has consisted of iterative development leading towards the creation of the *Murdoch Communication Skills Framework* (described in detail in the next section). This development has included detailed work on particular aspects of the Framework, as well as attempts to articulate an overall strategy. The following recommendations were proposed as the basis for a university-wide communication skills strategy at Murdoch, and were a major preliminary step in working towards the current Framework.

1. Development of communication skills should be embedded at both major and unit levels through curriculum design, pedagogy and assessment practices; and be clearly identifiable in:
  - communication skills-learning outcomes at course, major and unit levels
  - assessment
  - teaching activities and learning experiences
2. The CUTL team, ADLTs and discipline leaders should collaborate to provide opportunities for staff to engage in professional development activities on curriculum design, assessment and teaching aimed at developing students' communication skills.
3. Communication skills should be mapped across courses, majors and units, so that communication skills are developed progressively at different levels across courses.
4. Communication skills should be explicitly assessed as part of disciplinary learning, for example through the use of assessment rubrics that clearly articulate communication skills criteria and standards (including minimum standards).

5. Disciplinary learning should incorporate teaching and learning activities that help students develop their communication skills and that feed into assessment tasks.
6. A set of institution-wide communication skills rubrics, along the lines of the UWA *Communication Skills Framework* and American Associate of Colleges and Universities (AACU) *VALUE rubrics*, should be established to provide:
  - a common language for both staff and students across disciplines;
  - guidelines for the development of discipline specific learning outcomes, whole-of-course curriculum mapping and the use of assessment rubrics.
7. Communication skills diagnostic assessments should be given to all students in the first two weeks of semester in Transition units and selected postgraduate foundation or core units. Diagnostic results should be used to determine any additional support to be provided to individual students or student cohorts.

In addition, CUTL should continue to provide a range of additional support for communication skills development, including:

- individual consultations;
- lectures and workshops (both general and embedded within specific courses and units);
- credit-bearing communication skills units for undergraduate and postgraduate coursework students and a bridging program for Graduate Research Degree (GRD) students;
- intensive programs for specific cohorts.

CUTL should also further develop online and other resources, including Learning Management System (LMS) sites and communication skills guides for both staff and students. Learning analytics should be used to measure the success of different forms of support. As well as working towards the practical development of the current Framework, these recommendations also suggest some of the design principles that the project has led to on a more theoretical level, which are outlined towards the end of the paper.

## Description of the framework

Through an iterative process of development, the current Framework was developed (see Figure 2). The Framework is designed to both enhance staff capacities to embed and assess communication skills across the curriculum and enhance student capacities to develop communication skills in a disciplinary context. The key services and resources integrated into the Framework are:

- communication skills rubrics providing a common language for both staff and students across disciplines and guidelines for learning, teaching and assessing communication skills;
- professional development workshops and one-to-one support for staff on embedding communication skills into teaching and assessment;
- a community site for staff on the university's LMS complementing the workshops and providing online resources for teaching and assessing communication skills;
- diagnostic and self assessments for students enabling students to identify particular needs and access appropriate support;
- online modules for students enabling both independent learning online, as well as blended delivery in CUTL workshops or incorporation into disciplinary units.



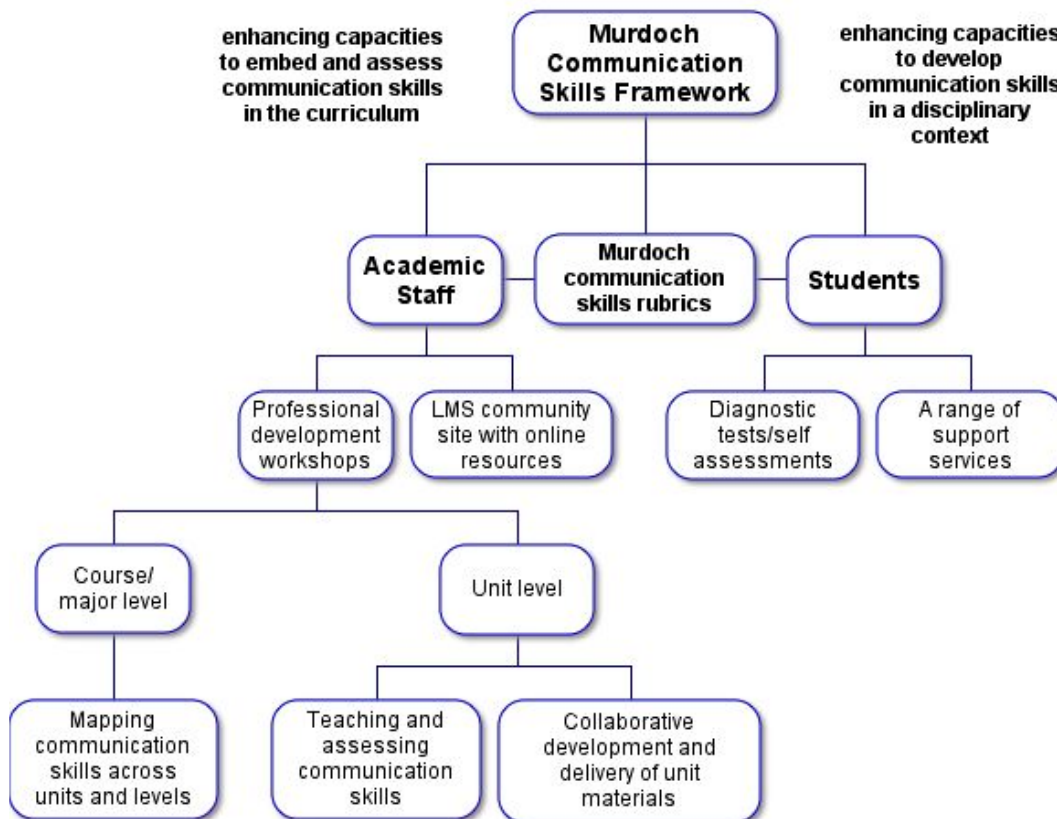


Figure 2: Murdoch Communication Skills Framework

### ***Communication skills rubrics***

Central to the Framework is a set of four particular communication skills rubrics, based on the American Association of Colleges and Universities (AACU, 2015) rubrics for ‘Written Communication’, ‘Oral Communication’, and ‘Reading’, as well as an ‘Interpersonal Skills’ rubric under development at the University. The AACU rubrics, part of a wider set of rubrics for essential learning outcomes, were adopted as they have already been widely adopted in the US and in a number of Australian universities (see Oliver, 2015, for examples). Their adoption is intended to provide a common language around expectations for both staff and students across disciplines, as well as informing standards for specific assessment tasks.

Although the rubrics were not developed as marking guides, they do provide guidelines for the development of both unit specific learning outcomes and assessment rubrics. Therefore, the rubrics can help to clarify not only the kind of communication skills students need when they graduate, but also how these skills are taught and assessed. They can help course and unit developers to consider how unit teaching activities and assessments differ across units and levels, and whether there is a smooth progression in the development of these skills. The rubrics have been approved by the University’s Academic Council for use in developing course, major and unit level learning outcomes.

### **Services and resources for staff**

Aspects of the Framework designed to enhance staff capacities include professional development workshops and a community site for staff on the university's LMS. These are intended to play a key role in promoting collaboration between disciplinary lecturers and CUTL staff, enabling the exchange of knowledge and expertise. For academics in the schools, the workshops provide an opportunity to work with colleagues to clarify the development of communication skills learning outcomes at the course level, and to share learning activities and resources. For CUTL staff, they provide an opportunity to promote best practices and to gain understandings of the particular priorities and requirements of different schools and disciplines.

Professional development workshops are available at both course, major and unit levels. At the course and major levels, workshops provide opportunities for staff to map communication skills learning outcomes, assessments, and learning and teaching activities, ensuring greater progression of skill development and scaffolding (both horizontal and vertical) across courses. Through this process, staff are able to identify gaps in coverage of particular skills, and exchange ideas about effectively teaching and assessing skills across the course. At the unit level, workshops focus on unit and assessment design, and the alignment of communication skills-learning outcomes, assessment, and teaching and learning activities. In addition, the staff community site is designed to complement and enrich the workshops by providing specific online resources to enable staff to embed communication skills across teaching and assessment. The site is also intended to help cultivate a community of practice (Wenger, McDermott & Snyder, 2002) around the development of communication skills at the university.

A final aspect of the Framework designed to enhance staff capacities is the collaborative development of unit-based practices and resources. As mentioned above, such collaborative development has already begun in the School of Education. Specific objectives for development depends on discussion of the communication requirements of students in the disciplines involved, but can include collaborative development of customised rubrics and marking guides, diagnostic assessments, 'signature assignments' (such as annotated bibliographies and argumentative essays in the Transition units) and online resources for students.

### **Services and resources for students**

Aspects of the Framework designed to enhance students' capacities to develop communication skills in a disciplinary context include diagnostic assessments and a range of support services and resources. Diagnostic assessments are being developed following the *Measuring the Academic Skills of University Students* (MASUS) procedure (Bonanno & Jones, 2007), which has been trialed and tested across a range of disciplines and is now being adopted by a number of universities. Linked to the communication skills rubrics, the diagnostics will be designed to enable students to identify particular needs and access appropriate support, as well as enabling staff to identify aspects of communication skills requiring particular attention in the curriculum. In order to provide flexible support for students, the Framework includes a range of support services and resources for students, including existing workshops and consultations, and online modules to be developed. Current plans are for an online module design incorporating short introductory videos from CUTL academics, interactive online resources (publicly available or developed by Murdoch) and self-assessment quizzes. Provision of the modules through an LMS site for students will enable independent learning, blended delivery through CUTL workshops, as well as embedding in disciplinary units within the schools.

## **Preliminary design principles**

As well as a practical Framework, the project has generated preliminary design principles for embedding the teaching, learning and assessment of communication skills in higher education. While some of these principles may be particularly relevant to Murdoch, all have relevance across the university sector.

### **1. Use of term ‘communication skills’**

This principle concerns the explicit use of the term ‘communication skills’, rather than related terms such as ‘academic literacy’ and ‘English Language Proficiency’ (Arkoudis, 2014). ‘Communication’ is the term used in AQF learning outcomes, as well as supporting resources such as *Learning and Teaching Academic Standards* and *Threshold Learning Outcomes* resources, and communication skills are listed in all these documents as key learning outcomes for all discipline areas. As noted above, ‘written and oral communication’ are also the terms most often used by employers, and are inherent in professional accreditation standards. For these reasons, communication skills apply to all students and discipline academics can see their relevance in their units and courses. The term ‘communication skills’ is also likely to appeal more widely to students, since it does not have the connotations associated with ‘literacy’ and ‘English Language Proficiency’ that may be negative or limiting for some students. Therefore, the term is more likely to promote the development of this learning outcome for all students, at all levels.

### **2. Explicit connection to learning outcomes**

This principle concerns explicit linking of communication skills development to course, major and unit level learning outcomes. As discussed above, making these connections enables more effective integration of the teaching and assessment of communication skills at all levels, as well as providing a focus for collaborative activities. Principled methods such as course mapping and constructive alignment (Biggs & Tang, 2007) are necessary to ensure the success of these activities. The use of institution-wide rubrics can support mapping and alignment processes, and can also play an important role in ensuring a common language and consistent standards for both staff and students.

### **3. Progressive skill development**

This principle concerns the development of communication skills across the stages of an educational degree, as well as across the developmental journey of each student. The development of particular skills needs to be scaffolded across degree levels through ‘benchmark’, ‘milestone’ and ‘capstone’ experiences (Finlay & Rhodes, 2013). Again, the use of institution-wide rubrics can facilitate this. Skill development should also be scaffolded, as appropriate to individual students or cohorts, across the developmental continuum from exit to entry (Arkoudis, Richardson & Baik, 2012). This can be facilitated by use of diagnostic assessments, as well as embedded teaching and learning activities and assessments.

### **4. Role enhancement in collaborations between disciplinary academics and ALL practitioners**

This principle states the need to enhance the roles of both disciplinary academics and ALL practitioners in order to increase the potential of collaborations. Jacobs (2007) stresses the central role of disciplinary academics in integrating communication skills in the curriculum, with

academic language and learning practitioners playing a supporting role in helping to explicate the discursive and communicative practices of particular disciplines. In collaborative activities, Jacobs suggests that ‘when disciplinary specialists, rather than language lecturers, initiated and produced integrated teaching materials, there were deep levels of integration’; however, ‘where language lecturers assumed the role of primary writer, the integration was more superficial and the texts lacked authenticity’ (Jacobs, 2007, p. 70). On the other hand, the experience of the current project has been that the potential of academic language and learning practitioners to contribute to deeper levels of integration is greater, the more they are included in school-based curriculum planning and development.

### **5. A multi-layered approach to embedding**

This principle concerns the inclusion of a variety of ways to embed communication skills in the curriculum. As outlined in the literature, embedding can occur on a continuum from what could be called ‘shallower’ to ‘deeper’ forms of embedding. Harris and Ashton (2011, p. 80) identified a continuum of collaboration from contextualised workshops by ALL practitioners (‘adjunct’), targeted workshops by ALL practitioners in core units (‘bolt-on’), in-class ALL practitioner support in core units (‘integrated’), curriculum renewal: ALL practitioners working with discipline teaching staff on content, pedagogy and assessment (‘embedded’), and curriculum renewal around core units (‘embedded’ and ‘integrated’). The highest levels of embedding and support are achieved when discipline staff play a leading role in integrating and embedding language development into their units and courses, and provide ongoing and embedded support. Notwithstanding the desirability of ‘deeper’ forms of embedding, a ‘multi-layered’ approach can provide the widest range of support options for diverse student cohorts (Briguglio & Watson, 2014).

### **6. Integration of components**

This principle concerns the integration of the key components of any strategy. In the Framework presented above, this integration largely centres on the communication skills rubrics (written, oral, reading, interpersonal). For example, the Written Communication rubric provides a scaffold for course mapping activities and the development of course, major and unit level learning outcomes; informs the criteria for the diagnostic assessment; and provides a focus for the development of resources for both staff and students. Integrating the components in this way ensures consistency, as well as promoting staff and student autonomy through greater transparency.

### **7. Choice and flexibility**

This principle concerns the provision of choice. The Framework presented is designed to enable staff and students to select or focus on particular areas or aspects of communication skills, depending on their disciplinary priorities or learning needs, rather than being a prescriptive model. In keeping with contemporary understandings about the disciplinary nature of academic communication and literacy (Lea & Street, 1998; Jacobs, 2007) alongside the more generic nature of language proficiency, the Framework also aims to enable flexibility, for example in the use of tools such as rubrics. The adoption of the [se](#) resources is intended to assist staff to develop communication skills outcomes at these levels, and in appropriate units, rather than as a mandatory requirement that must be met for all skills in all units. Therefore, the rubrics are [intended](#) to be adapted or modified as needed.

### **8. Different support for different dimensions of communication skills**

This principle concerns the way in which particular dimensions of communication skills can be supported in different ways. For example, particular aspects of written communication can be supported in appropriate ways with workshops and online resources for staff, modules for students, or both. Some aspects, such as ‘control of syntax and mechanics’ can be appropriately supported by generic resources, while other aspects, such as ‘genre and disciplinary conventions’ require specific (genre or discipline-based) support that can be provided through collaborative, discipline-based resources.

## **Conclusion**

Effectively embedding the teaching and learning of communication skills across the curriculum in higher education is a complex problem that requires systematic, institutional approaches, and collaboration between disciplinary academics and academic language and learning practitioners, with knowledge of best practices across the sector. Design-based research offers a constructive way to address this problem by drawing on existing practices and expertise to create practical solutions, as well as theoretical principles to guide this work. This paper has reported on work in progress towards a Communication Skills Framework and a set of guiding principles, following the first two stages of a design-based research process. The project has established the basis for further work according to the remaining stages to evaluate aspects of the Framework through data collection, reflect on the effectiveness of particular aspects and finally to refine both the practical Framework itself and the design principles the project has generated. In this way, the project aims to contribute to broader understandings of this complex issue, as well as practical solutions, across the higher education sector.

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