TRANSFORMING THE LIBRARY'S IMPACT IN THE CURRICULUM: RECONCEPTUALISING THE LIBRARY'S CONTRIBUTION TO STUDENTS' RESEARCH SKILL DEVELOPMENT.

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Abstract

Monash University Library has adopted and implemented the Research Skill Development (RSD) framework (Willison and O'Regan, 2006/2013) to inform the library's information research and learning skills programs. The RSD framework articulates the explicit, cyclic and incremental development of students' research skills and presents a coherent approach to curriculum and assessment design.

The RSD is providing a language in common between librarians, learning skills advisers (co-located in the library) and discipline academics to enable the in-curricula development of students' research skills as a shared endeavour. Collaborative library-faculty partnerships underpinned by the RSD are transforming the library's educative contribution within the curriculum. The Library's leadership role through dissemination of the RSD framework is repositioning and maximising the library's educative impact across the university.

A key significant outcome of the effectiveness of the Library initiated approach has led to the RSD framework becoming a strategic priority that underpins the Monash University Education Strategy 2011-2015. Through in-curricula and co-curricular RSD informed approaches for students' research skill development, Library teams have engaged with academics and students in all ten faculties at Monash affecting 73,681 students from 2012 - June 2014. The Library is now firmly positioned in the curriculum design and development regime at Monash University.

Background and context

For the past two decades academic libraries have explored how best to connect with faculty to bring the expertise of library staff to the curriculum. Enabling library-faculty teaching partnerships for the development of students' research skills is now recognised by academic libraries as "the role of the information professional in fostering student learning" (Bruce, 2001, p. 108). Academic libraries worldwide have adopted strategies to promote the educative role of the library to better connect with the curriculum primarily through forging teaching partnerships with academics (Christiansen, Stombler & Thaxton, 2004; Smith, 2011; Moselen & Wang, 2014). However, the literature asserts that in both national and international arenas, progress in achieving authentic library-faculty teaching partnerships for the integration and assessment of students' research skills within the knowledge curriculum proceeds at a slow pace (Bruce, 2001; Doskatsch, 2001; Ivy, 2009). The academic library's ability to influence the skills curriculum and embed students' research skill acquisition at the point of need and progressively within disciplinary knowledge is a challenging pursuit. The complexity of this endeavour often results in the library's contribution to student learning remaining disconnected from the curriculum and overlooked or misunderstood by the institution (Bruce, 2001, 2011, Doskatsch, 2003; Darshani Wijayasundara, 2008).

Monash University Library's (MUL) experience contributing research skill expertise within the curriculum has much in common with experiences described in the literature. MUL has also been challenged by institutional barriers, academic hierarchies and the perceptions and misconceptions of the library's educative role within the institution. Despite the challenges, MUL has over the years forged library-faculty partnerships and developed library learning programs for students through generic, integrated or embedded library programs. However, the desired goal at MUL is to increase and sustain embedded discipline specific research skill programs that also meet the appropriate student learning level, yet achieving this objective has been difficult to realise and evidence.

In light of national educational drivers and responding institutional priorities to improve the student experience and learning outcomes, this paper describes how a library-led initiative to adopt a single conceptual model to inform the library's research and learning programs is transforming the educative contribution of the library within curricula. A reconceptualised approach for students' research skill development has emerged.

The Monash Model - Librarians and Learning Skills Advisers working in collaboration
A new organisational structure at MUL was implemented in 2008 incorporating librarians and learning skills advisers co-located and working collaboratively in dedicated library faculty teams. This new arrangement provided the means for librarians and learning skills advisers to work with each other and with academic staff to ensure integration of learning skills and information literacy into coursework (Smith, 2011). Through this new working model, librarians and learning skills advisers collaboratively design, develop and teach discipline specific research and learning skills programs.

> *"In assuming responsibility for a broad spectrum of skills development for students, the library's vision was to take a holistic student centred approach to providing a high quality, visible and accessible services, resources and programs that meets students' learning needs and inspire them to actively participate in the learning process." (Smith, 2011, p. 249).*

To more closely align with the academic and student communities and to move away from any remedial misunderstandings associated with the term 'literacy' the library moved away from traditional nomenclature known in the profession as 'information literacy skills' to 'information research skills' in 2010 (Smith, 2011). The terminology has now evolved to 'research and learning skills' to encompass the respective and collaborative contributions made my librarians and learning skills advisers to the library's learning programs whist communicating a holistic approach to students' skills development.

A new inter-professional library team structure engineered for the purpose of strengthening the library's learning programs required a pedagogical platform on which to build teaching relationships, find common ground between professional groups and build trust and understandings of each other's roles. The Research Skill Development (RSD) framework (Willison and O'Regan, 2006/2013) was introduced by the Information Research Skills Manager and Learning Skills Manager for this purpose - to underpin the collaboration between librarians and learning skills advisers and to further the educative strategies of the library relevant to students' research and learning skill development.

Expanding the RSD conversations to include discipline academics interested in making students research skills explicit within their units as a shared responsibility between librarians, learning skills advisers and faculty, gradually galvanised new partnerships and invigorated established library-faculty teaching collaborations (Torres, McCann, Croy, Mayson & Schapper, 2011; Smith, 2011). The success of the initial library-led grass roots initiative for students' research skill development using the RSD framework has been subsequently institutionally endorsed as a strategic priority underpinning the *Monash University Education Strategy 2011-2015.* (p. 7).

Research skills and the RSD framework

The RSD framework (See appendix A) presents a conceptual model for aligning assessment with curriculum design for students' research skill acquisition coherently, progressively and explicitly through the curriculum at the unit and course levels. The RSD brings together multiple educational understandings related to research skill development in a concise, theoretically informed framework that articulates the explicit, cyclic and incremental development of student research skills incorporating: student autonomy (Boud, 1988; Australian and New Zealand Information Literacy standards (ANZIL) and Bloom and colleagues' (1956) Taxonomy of Educational Objectives (Willison & O'Regan, 2007). The ANZIL standards incorporate the characteristics, attributes, processes, knowledge, skills, attitudes, beliefs and aspirations of the research process.

Research skills are defined as core skills fundamental to a student's successful engagement with university coursework (Willison, 2010; Brew, 2013) and are skills valued by employers when entering the workplace (Barnett, 2005; Head, Van Hoeck, Eschler & Fullerton, 2013). Research skills encompass the ability to conceptualise and pose researchable questions, find and generate information or data, evaluate and reflect on methods and sources, organise and manage information, synthesise and apply knowledge, and communicate understandings with an awareness of ethical and social issues throughout the research process (ACRL, 2000; Bundy, 2004; Willison & O'Regan, 2006, 2012).

The RSD's 'extent of student autonomy' has been a particularly important concept for reconceptualising library programs and learning activities. This element of the RSD framework progressively describes student research activities ranging from low autonomy, prescribed research, highly structured closed-inquiry activities with high degrees of guidance, to highly autonomous, open research, student-specified activities with self-determined guidelines. Importantly for library research and learning programs, RSD informed curricula evidence that a coherent approach to curriculum and assessment design enables students to attain research skills appropriate to the discipline at the course and unit levels (Willison, Le Lievre and Lee, 2010; Willison, 2012; 2014).

Rationale for embedding research skills within curricula

Embedding research skills within disciplinary content has gained attention over the past decade in the higher education sector (Boyer Commission, 1998; Healey & Jenkins, 2009; Barnett, 2000; Brew, 2006, 2010, 2012; Willison, 2010, 2012). Longitudinal studies undertaken by Justice, Rice and Warry (2007-2009) conclude that when research skill development is integrated as a key component of curriculum and assessment design,

significant gains are achieved that include improved student academic performance and a pedagogically invigorated curriculum. A subsequent and more recent study by Willison (2012) extends these findings to conclude that when research skills are made explicit to students within the context of their learning "students clearly perceive that they developed discipline-specific research skills and that these were useful for current or projected employment as well as studies" (p. 917).

Bruce (1994) notes, in Chen & Pei-Chun (2011) that effective information literacy models involve "co-operation between information specialists and discipline experts to achieve curriculum innovations which foster information literacy" (p. 408). Involvement in curriculum innovation therefore suggests that Library staff should be actively planning, designing and evaluating the library's contribution to the skills curriculum. Nonetheless, as noted by Doskatsch (2003) and Ivey (2003) although academic libraries actively encourage partnerships with academics to enable the development of students' research skills within curricula, achieving authentic and sustained teaching partnerships is a challenging endeavour. Academic libraries over the years have experienced more challenges than successes as institutional organisational structures, disciplinary differences and professional hierarchies disconnect librarians, learning skills advisers and academics in their efforts to improve student learning outcomes (Christiansen, Stombler and Thaxton, 2004; Chanock, 2007; Darshani Wijayasundara, 2008; Chen & Pei-Chun, 2011).

Rationale for the RSD

MUL's Information Research Skills Manager and the Learning Skills Manager realised the potential of the Research Skill Development (RSD) framework to catalyse inter-professional teaching partnerships between librarians and learning skills advisers working in re-designed library faculty team structures. The RSD resonated with these managers, who also recognised that the use of a theoretically informed pedagogical tool articulating the steps and skills of the research that also articulates the incremental scaffolding of research skill in learning activities and assessment tasks could provide a means to 'bridge the divide' between library and faculty. Significantly for library research skills programs, the RSD extends traditional Library definitions and interpretations of information literacy by presenting a comprehensive continuum that allows the entire information literacy journey to be conceptualised through a constructivist learning approach.

The implementation of the RSD framework shows that the importance of using a language in common between educators to enhance student learning. The language of the RSD communicates a newly visible skills continuum in a mutually understood language. This means that a single pedagogical tool has enabled the delivery of a shared response between educators to incrementally develop students' research skills in curricula that are inclusive of different pedagogies and disciplines. Furthermore, the use of a common framework is demonstrating that perceived library-faculty silos and barriers associated with curriculum 'ownership' can be overcome through the ability to clearly articulate the library-faculty contributions to skills curricula.

Of particular significance is the way in which the RSD converts and operationalises the information literacy standards (ANZIL, 2004) to a practical pedagogical tool, whist remaining non-prescriptive and versatile. Therefore, the RSD not only describes the skills associated with the research process but presents 'how' these skills can be progressed explicitly and

coherently in the curriculum through the RSD's 'Extent of Student Autonomy'. This aspect of the RSD connects library programs together with assessment and curriculum design as progressive scaffolded skills development which is difficult to realise and operationalise with the ANZIL standards alone.

The use of a common framework with which to engage both academic staff and library staff with the skills curriculum had great potential to optimise the deployment of Library expertise more productively for student learning and to better connect library programs with the educational objectives of the university.

Adopting the RSD framework

At the introductory phase, the RSD was not implemented as a policy driven initiative. Library Management supported but did not over-regulate or mandate expectations to take up the RSD, recognising that a policy driven initiative would not be respectful to staff requiring time to learn about the framework and to transition to a reconceptualised teaching practice. Managers were therefore aware of and sensitive to the personal and professional journey of changing work practice, or as Chappell (2003) puts it, "as the 'new knowledge' workers renegotiate a sense of who they are in reconstructing workplaces" (p. 136). Furthermore, Library management recognised that "there is a distinction between the extent to which the organisational and pedagogical context affords access to diverse forms of participation and the extent to which individuals 'elect to engage' in those opportunities through individual agency" (Fuller & Unwin, p. 32). This acknowledgement allowed Library staff to decide when the time was 'right' for them professionally to commence exploring and applying the RSD to their practice. It was important that library staff still retained personal agency over when or whether they collaboratively engaged with the RSD. A supportive workplace environment provided a means to build on past and valued achievements whist articulating a way forward for the library's contribution to students learning.

The approach employed for RSD adoption was therefore self-regulatory, and was as Hargreaves and Shirley describe as:

> "…a democratic and professional path to improvement that builds from the bottom, steers from the top, and provides support and pressure from the sides…committed and capable of creating deep and broad teaching and learning, it builds powerful, responsible and lively professional communities..." (p. 107).

Transitioning to RSD informed library programs was therefore owned by the librarian and learning skills advisers themselves. Staff built capacity and confidence with the RSD through guided and supported formal and informal learning opportunities with the library's growing RSD community of practitioners. This sensitive approach to change management has resulted in internal organisational transformation and shifts in the professional perceptions held by library staff of their ability to influence and contribute authentically to students' research skill development.

Learning about the RSD through a Community of Practice model

Smith and Sadler-Smith (2006) describe a 'learner centred paradigm', where a 'workplace support space' facilitates and enables learning through a combination of self-directed learner development and workplace learning strategies to achieve the organisation's

objectives. Learning opportunities in the workplace at MUL are diverse and are part of workplace practice. Developing, encouraging and building the capacity of library staff through self-directed learning opportunities is part of everyday workplace activity and workplace goals and is strongly valued and encouraged by management.

A diverse and supportive social learning environment was already in place for staff to commence engaging with and exploring the RSD. This ethos was necessary to create the foundation for building staff capacity to encourage and lead RSD adoption across the University. Workplace learning for the RSD incorporated multiple and flexible participatory and situated learning opportunities that recognised the learning needs and learning styles of individuals.

Engaging with the RSD in situated learning settings presented a safe and unthreatening learning environment, reflecting Wenger's (1988) theory of learning through co-participation amongst peers in a community collective. The preferred and most effective learning dimensions for adult learners to develop capacity through workplace learning experiences involve participatory learning paradigms such as peer to peer learning, mentoring and participation in communities of practice (CoP) (Hughes, Jewson & Unwin, 2007). Librarians and learning Skills Advisers (43 staff in total EFT) developed their understanding and confidence with RSD informed approaches for their practice through informal interactions with colleagues through 'water-cooler' conversations, one to one learning experiences or as a collective through scheduled peer to peer learning, mentoring and scaffolded guided learning in small groups lead by an 'expert' respected colleague. Learning through common authentic activities and experiences shared and modelled to library staff has been central to the successful implementation of the RSD across faculties. The informal CoP providing a learning 'structure' to explore, build knowledge and develop common understandings of the RSD for student's research skill development as a professionally shared endeavour from the outset.

Of particular value for library staff has been a 'novice to expert' learning model (Lave and Wenger, 1991) for developing staff skills and competencies. Participation through this learning model has gradually increased library staff confidence with and capacity to adopt the RSD for their teaching practice. As confidence with the RSD increased library staff initiated conversations with discipline academics to introduce and explore the potential of the RSD to underpin collaborative teaching partnerships for students' research skill development within curricula. A novice to expert staff capacity building strategy, and a commitment to collegial sharing of ideas and resources enabled the RSD to gain momentum across the university.

Library staff capacity building

The RSD was first introduced into Library staff and academics in 2009 through a workshop titled: 'RSD Bring a Friend (BaF) Workshop" where Librarians and learning skills advisers invited an academic colleague with whom they had an established working relationship. Academics (*N*=13) from seven faculties: Arts, Business and Economics, Law, Medicine Nursing and Health Sciences, and Pharmacy and Pharmaceutical Sciences participated in the RSD workshop alongside their library colleagues (*N*=15). This workshop successfully brought librarians, learning skills advisers and discipline academics together to identify shared

interests in exploring the challenges of developing students' research skills within disciplinary content and to explore the potential of the RSD framework for this purpose.

The workshop was met with an enthusiastic response from academics willing to engage with the RSD. Evaluation of the BaF workshop revealed that the librarians and learning skills advisers were keen to collaborate with academics but needed more opportunity to increase familiarity and confidence using the framework. A further RSD workshop for library staff was co-facilitated by a librarian and a learning skills adviser who had attended the BaF workshop and who had commenced applying the RSD to their practice. They felt ready to commence championing the RSD amongst library peers.

To continue to strengthen and grow the library-led RSD CoP, sustainable peer-to-peer capacity building RSD workshops have been central to the Library's effort to develop staff capacity. RSD workshops have been systematically repeated throughout 2010-2014 by enlisting two library novices to co-facilitate RSD workshops for new library staff, for faculties and in response to national and international interest in the MUL's RSD approach.

Disseminating the RSD and building staff capacity across the university

By identifying sustainable dissemination and capacity building strategies Library teams have reached large numbers of students and academics. Harnessing the potential of existing staff resources and organisational library structures of dedicated faculty teams of librarians and learning skills advisers, RSD conversations were initiated with discipline academics. This model and approach has been instrumental for and igniting the RSD across the university as a cost neutral initiative, purposefully adopted so the outcomes are sustainable over time. Improving efficiencies of delivery are in keeping with MUL initiatives to strengthen library staff capacity, expertise and contribution within the curriculum.

Establishing broad strategic alliances at Monash University have been instrumental to successfully disseminating the RSD more broadly across the university. Library teams have developed RSD modules specifically for the Graduate Certificate in Higher Education (GCHE 2010, 2011,) and the Graduate Certificate in Academic Practice (GCAP 2012, 2013, 2014). Library teams have engaged 870 academics, librarians and learning skills advisers in RSD-informed approaches through the facilitation of 32 workshops held at all Monash University campuses, including Monash International campuses in Malaysia and South Africa.

> *"The workshops were invaluable for introducing a different way of thinking about research itself, and about research methods - as a cycle of continual learning and development, and as a framework of skills. What students learned most was about seeing themselves as researchers, a point we often forget to make in teaching on research methods." Academic, Faculty of Arts, Monash University.*

In challenging times when organisations need to be agile and seek different ways to configure resources for maximum gain, the library staff themselves have enhanced the quality of the business 'product' and extended the breath and impact of the library's contribution to learning. Utilising existing staff numbers, enhancing the experience of learning in the workplace and embracing current and developing new workplace learning methods has created a successful and sustainable working model for the future.

The benefits of this partnership model using the RSD framework have reconceptualised the library's approach to information literacy programs, transformed perceptions of the educative value of the library across the University and transcended historic library/faculty and academic/professional staff silos (Torres, McCann, Croy & Mayson, 2011; 2012; Smith, 2012; Tiab & Holden, 2013; Pretorious, Bailey & Miles, 2014; Willison, 2014).

Changing perceptions of educational roles

The RSD, as a pedagogical tool that operationalises the ANZIL standards and articulates skill development progressively over time, has been used at MUL as a teaching tool for library staff. Opportunities to observe the teaching practice of librarians is demonstrating that the pedagogical knowledge and teaching skills of MUL librarians are developing and progressing through engagement with the RSD. The RSD also provides a means for librarians and learning skills advisers to evaluate self-assess and reflect on practice. Furthermore the RSD as a pedagogical tool is providing a means for the library to transition from traditional instructional teaching models to student-centred learning strategies strengthened though collaborative partnerships between librarians, learning skills advisers and academics.

Librarians report that they feel more empowered using a tool that enables them to communicate more clearly to the faculty and discipline academics how their expertise and specialist skills can contribute to student learning using the language of educators rather than through the language of librarianship. Using the domain specific language of librarianship with academics risks the message becoming - 'lost in translation'. A common language with academics is increasing library staff confidence, enabling librarians to take professional risks and to become more deeply, broadly and imaginatively involved in curricula.

> "The RSD has been particularly helpful for me as a framework for thinking about the research process and learning in the university. It helps me to unpack assessment tasks and marking criteria for students when they come to the Research and Learning Point. It also provides a context within which to create Library sessions. Understanding research skills as a dynamic interaction between the facets of inquiry and the levels of autonomy has helped me provide more focused rather than 'just in case' sessions". Subject Librarian, Faculty of Arts, Monash University.

Gaining familiarity with the RSD has been a gradual process, however, for the librarians in particular using the RSD in their professional practice is suggesting that a shift is taking place in how librarians are conceptualising their contribution to the curriculum. The RSD is providing the means to transforming information literacy programs and librarians' professional identities as educators.

Collaboration with the library using the RSD framework is also changing academic's perceptions of the contribution library staff can make to the curriculum and the educational role of the library within the skills agenda.

> "I have transformed two of my units so that RSD became the backbone of all the activities and assessment in the units and it is going really well with the students being really at ease with designing rubrics and most importantly [students] self and peer assess all the work done by all

the groups… I love this tool it fits so well with my PBL units and brought so many good reflections from the students!"
Lecturer, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University.

RSD informed research and learning skills programs
The RSD framework has been explored and utilised in novel by Monash Library staff and has included making research skills explicit in learning tasks and activities; writing learning objectives and designing assessment that explicitly develops students research skills; mapping discipline specific research skills across course curricula; creating student skill perception surveys to gain understandings of students' research skill abilities; developing and evaluating e-Learning tutorials and modules; designing library webpages for research skill learning resource and informing Research Data Management workshops and webpages.

Mapping curricula using the RSD has identified the gaps and duplications in skill development, providing opportunities for discipline academics to evidence where skills are taught, practised and assessed. Examples of Library-faculty collaboration in this regard, was with the Faculty of Pharmacy and Pharmaceutical Sciences (Stewart, Styles, Torres, McCann & Horne, 2011), the Faculty of Information Technology and the Faculty of Business and Economics (Taib & Holden, 2013). These projects were undertaken to map discipline specific research skills across undergraduate coursework using tools informed by the RSD. This has enabled course leaders and library staff teaching into these courses to track and ensure coverage of requisite skills for students to successfully engage with content.

In addition, identifying gaps in skill development has allowed the Library to develop targeted in-curricula research and learning skills programs for students and to enhance skills curriculum as a shared objective. Library staff have also designed, developed and delivered RSD rubrics workshops to academics that include research skills as an assessed component of the learning task.

Evaluation Outcomes and Impact

Ongoing evaluation of RSD workshops are part of the Library's continuous improvement cycle. The library first started collecting statistics for RSD informed learning programs in 2012. Impact on learning is the defining evaluative characteristic of the library's use of the RSD as a tool for enabling collaborations with discipline academics and to bring professional services to the centre of academic teaching rather than peripheral add-ons. Data on the Library's impact on the curriculum including data from RSD workshops delivered locally, nationally and internationally has been collected from 2010–2014. To validate the effectiveness, impact and learning outcomes of the RSD program, formal and informal evaluation strategies and new data collection mechanisms have been developed by the Library. Quantitative data shows that 73,681 students from 2012 to Semester 1, 2014 had participated in RSD informed library programs either through curricula or co-curricular classes. Library statistics since 2012 to date evidence that 71.3% of Library research skill programs are RSD informed and that 56% of these are embedded in faculty units within courses.

Qualitative evaluations are consistently high on participant satisfaction with participants routinely stating they would recommend the RSD workshops to colleagues. Participant

evaluations also note that the value of the workshops lie in the relevance of the RSD to their teaching practice. For example, responses to the question 'Concepts or skills from the workshop that will be most useful for my teaching practice' typically included:

"Applying the RSD language into unit objectives and unit assessment tasks"

"How to redevelop existing curriculum to integrate RSD principles"

"Theoretical basis for constructing rubrics"

"Improve my teaching and assessment skills"

"The RSD could strengthen and further develop our existing approach of making the expectations and demands of university learning (and therefore research) overt and clear." GCHE student, 2011

Conclusion

Developing the research, inquiry and learning skills of all students in a multi-campus, global university with a diverse student cohort has been a long-standing and challenging endeavour for academic libraries. The experience at MUL through the adoption of the RSD is contrasting this international trend. The RSD is making a significant impact towards repositioning the Library's contribution to learning from a service model approach to an educational partnership model. By initially championing the RSD, and by pursuing its dissemination strongly, the Library has been at the vanguard of a whole of institution approach to towards invigorating the skills curriculum. The RSD now underpins the teaching practice between librarians, learning skills advisers and collaborating discipline academics to enable the development of students' research skills as a shared responsibility between library and faculty. Of significance was the way in which library staff and academics engaged with the RSD as an organic grass-roots initiative leading to the subsequent institutional endorsement of the RSD framework.

Innovative change has seeded from the ground up by practitioners actively taking responsibility for reforming their practice rather than through mandated change A stronger nexus now exists between areas and roles that have traditionally been perceived as quite distinct in the university. Targeted research and learning programs have been developed as a result with the means to progressively develop students' research skills within disciplinary contexts. The importance of the Library's leadership strategies to enhance research and learning programs for all students to succeed goes beyond the implementation of the RSD framework articulating a newly visible and reconceptualised shared path to student research skill development.

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Appendix A. The Research Skill Development framework.

Research Skill Development Framework

www.rsd.edu.au

A conceptual framework for the explicit, coherent, incremental and cyclic development of the skills associated with researching, problem solving and critical thinking

Extent of Students' Autonomy

What characterises the difference between 'search' and 'research'? More searching and more data generation is just a 'biggasearch'! Research is when students...

Facet of Research	Level 1 (Prescribed Research) Highly structured directions and modelling from educator prompt student research	Level 2 (Bounded Research) Boundaries set by and limited directions from educator channel student research	Level 3 (Scaffolded Research) Scaffolds placed by educator shape student independent research	Level 4 (Student-initiated Research) Students initiate the research and this is guided by the educator	Level 5 (Open Research) Students research within self-determined guidelines that are in accord with discipline or context.
a. Embark & Clarify (Curious) Respond to or initiate research and clarify or determine what knowledge is required, heeding ethical/cultural and social/team considerations.	Respond to questions/tasks arising explicitly from a closed inquiry. Use a provided structured approach to clarify questions, terms, requirements and expectations.	Respond to questions/tasks required by and implicit in a closed inquiry. Choose from several provided structures to clarify questions, terms, requirements and expectations.	Respond to questions/tasks generated from a closed inquiry. Choose from a range of provided structures or approaches to clarify questions, terms, requirements and expectations.	*Generate questions/aims/ hypotheses framed within structured guidelines*.	*Generate questions/aims/ hypotheses based on experience, expertise and literature*.
b. Find & Generate (Determined) Find and generate needed information/data using appropriate methodology.	Collect and record required information or data using a prescribed methodology from a prescribed source in which the information/data is clearly evident.	Collect and record required information/data using a prescribed methodology from prescribed source/s in which the information/data is not clearly evident.	Collect and record required information/data from self-selected sources using one of several prescribed methodologies.	Collect and record self-determined information/ data from self-selected sources, choosing an appropriate methodology based on structured guidelines.	Collect and record self-determined information/data from self-selected sources, choosing or devising an appropriate methodology with self-structured guidelines.
c. Evaluate & Reflect (Discerning) Determine and critique the degree of credibility of selected sources, information and of data generated and reflect on the research processes used.	Evaluate information/data and reflects on inquiry process using simple prescribed criteria.	Evaluate information/data and reflect on the inquiry process using given criteria.	Evaluate information/data and inquiry process using criteria related to the aims of the inquiry. Reflect insightfully to improve own processes used.	Evaluate information/data and the inquiry process comprehensively using self-determined criteria developed within structured guidelines. Reflect insightfully to refine others' processes.	Evaluate information/data and inquiry process rigorously using self-generated criteria based on experience, expertise and the literature. Reflect insightfully to renew others' processes.
d. Organise & Manage (Harmonising) Organise information and data to reveal patterns and themes, and manage teams and research processes.	Organise information/data using prescribed structure. Manage linear process provided.	Organise information/data using a choice of given structures. Manage a process which has alternative pathways.	Organise information/data using recommended structures. Manage self-determined processes with multiple possible pathways.	Organise information/data using student-determined structures, and manage the processes, within the parameters set by the guidelines.	Organise information/data using student-determined structures and management of processes.
e. Analyse & Synthesise (Creative) Analyse information/data critically and synthesise new knowledge to produce coherent individual/team understandings.	Analyse and synthesise information/data to reproduce existing knowledge in prescribed formats. *Ask emergent questions of clarification/curiosity*.	Analyse and synthesise information/data to reorganize existing knowledge in standard formats. *Ask relevant, researchable questions emerging from the research*.	Analyse and synthesise information/data to construct emergent knowledge. *Ask rigorous, researchable questions based on new understandings*.	Analyse and create information/data to fill knowledge gaps stated by others.	Analyse and create information/data to fill student-identified gaps or extend knowledge.
f. Communicate & Apply ethically (Constructive) Write, present and perform the processes, understandings and applications of the research, and respond to feedback, accounting for ethical, social and cultural (ESC) issues.	Use mainly lay language and prescribed genre to demonstrate understanding for lecturer/ teacher as audience. Apply to a similar context the knowledge developed. Follow prompts on ESC issues.	Use some discipline-specific language and prescribed genre to demonstrate understanding from a stated perspective and for a specified audience. Apply to different contexts the knowledge developed. Specify ESC issues.	Use discipline-specific language and genres to demonstrate scholarly understanding for a specified audience. Apply the knowledge developed to diverse contexts. Specify ESC issues in initiating, conducting and communicating.	Use discipline-specific language and genres to address gaps of a self-selected audience. Apply innovatively the knowledge developed to a different context. Probe and specify ESC issues in each relevant context.	Use appropriate language and genre to extend the knowledge of a range of audiences. Apply innovatively the knowledge developed to multiple contexts. Probe and specify ESC issues that emerge broadly.

... spiral through the facets, adding degrees of rigour and discernment as they delve.

Research Skill Development (RSD), a conceptual framework for Primary school to PhD, developed by John Willison and Kerry O'Regan ©, October, 2006/November, 2012, with much trialling by Eleanor Peirce and Mario Ricci. Facets based on: ANZIIL (2004) Standards & Bloom's et al (1956) Taxonomy. * Framing researchable questions often requires a high degree of guidance and modelling for students and, initially, may need to be scaffolded as an outcome of the researching process (Facet E, Levels 1-3). After development, more students are able to initiate research (Facet A, Levels 4 & 5)*. The perpendicular font reflects the drivers and emotions of research. Framework, resources, learning modules and references available at http://www.rsd.edu.au. For information: john.willison@adelaide.edu.au