Active Cognitive Engagment

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

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What characterises the move from 'search' to 'research'? Gathering more information and generating more data is merely a bigger search! Research is when **students…**

Extent of Students' Autonomy

Facets of Research	Prescribed Research- Level 1 Highly structured directions and modelling from educator prompt research, in which students…	Bounded Research- Level 2 Boundaries set by and limited directions from educator channel research, in which students…	Scaffolded Research- Level 3 Scaffolds placed by educator shape independent research, in which students…	Self-actuated Research- Level 4 Students initiate the research and this is guided by the educator to…	Open Research- Level 5 Students determined guidelines for the research that are in accord with discipline or context to …
a. Embark & Clarify Respond to or initiate research and clarify or determine what knowledge is required, heeding ethical, cultural, social and team (ECST) considerations. — Curious	Respond to questions/tasks arising explicitly from a closed inquiry. Use a provided structured approach to clarify questions, terms, requirements, expectations and ECST issues.	Respond to questions/tasks required by and implicit in a closed inquiry. Choose from several provided structures to clarify questions, terms, requirements, expectations and ECST issues.	Respond to questions/tasks generated from a closed inquiry. Choose from a range of provided structures or approaches to clarify questions, terms, requirements, expectations and ECST issues.	**Generate questions/aims/ hypotheses framed within structured guidelines**. Anticipate and prepare for ECST issues.	**Generate questions/aims/ hypotheses based on experience, expertise and literature**. Delve into and prepare for ECST issues.
b. Find & Generate Draw on prior knowledge and find and generate needed information/data using appropriate methodology. — Determined	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 given methodology from pre-determined 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 provided methodologies.	Collect and record self-determined information/ data from self-selected sources, choosing an appropriate methodology based on parameters set.	Collect and record self-determined information/data from self-selected sources, choosing or devising an appropriate methodology with self-structured guidelines.
c. Evaluate & Reflect Determine and critique the degree of credibility of prior knowledge and of selected sources, information and data generated. Metacognitively reflect on the research processes used. — Discerning	Evaluate prior knowledge/sources/information/ data using simple prescribed criteria to specify credibility and to reflect on the research process.	Evaluate sources/information/data using a choice of provided criteria to specify credibility and to reflect on the research process.	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 parameters given. 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 Organise information and data to reveal patterns and themes, and manage teams and research processes. — Harmonising	Organise information/data using prescribed structure. Manage linear process provided (with pre-specified team roles).	Organise information/data using a choice of given structures. Manage a process which has alternative possible pathways (and specify team roles).	Organise information/data using recommended structures. Manage self-determined processes (including team function) with multiple possible pathways.	Organise information/data using self-determined structures, and manage the processes (including team function) within the parameters set.	Organise information/data using self-determined structures and management of processes (including team function).
e. Analyse & Synthesise Analyse information/data critically and synthesise new knowledge to produce coherent individual/team understandings. — Creative	Interpret given information/data and synthesize knowledge into prescribed formats. **Ask emergent questions of clarification/curiosity**.	Interpret several sources of information/ data and synthesise to integrate knowledge into standard formats. **Ask relevant, researchable questions emerging from the research**.	Analyse trends in information/data and synthesise to fully integrate component parts in structures appropriate to task. **Ask rigorous, researchable questions based on new understandings**.	Analyses information/data and synthesizes to fully integrate components, consistent with parameters set. Fill knowledge gaps that are stated by others.	Analyse and synthesise information/data to generalise or abstract knowledge that addresses self-or-group-identified gaps in understanding.
f. Communicate & Apply Write, present and perform the processes, understandings and applications of the research, and respond to feedback, accounting for ethical, cultural, social and team (ECST) issues. — Constructive	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 ECST 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 ECST issues.	Use discipline-specific language and genres to demonstrate scholarly understanding for a specified audience. Apply the knowledge developed to diverse contexts. Specify ECST issues in initiating, conducting and communicating.	Use appropriate language and genres to address gaps of a self-selected audience. Apply innovatively the knowledge developed to a different context. Probe and specify ECST 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 ECST issues that emerge broadly.

…spiral through these facets, adding degrees of rigour and discernment. The move from problem solving to problem optimisation and from thinking to thinking critically likewise require adding rigour to these facets.

Research Skill Development (RSD), a conceptual framework for Primary School to PhD, developed by © John Willison and Kerry O'Regan, October 2006/October 2013, with much trialling by Eleanor Peirce and Mario Ricci. Facets based on: ANZIIL (2004) Standards & Bloom's et al. (1956) Taxonomy. Extent of Synthesis informed by SOLO taxonomy (Biggs & Collis, 1982). * 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, videos and references available at www.rsd.edu.au. Information: john.willison@adelaide.edu.au