

## Research mindedness: a curriculum approach to RIT at CCCU

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Experiences from the RIT initiative at CCCU have illustrated the potential of developing students' experience of research to enhance their progression in HE and also to contribute to their employability. Students increasingly expect the approach to learning in higher education to be flexible and the learning opportunities and support to facilitate a non-linear experience which is available 24/7. CCCU is committed to enhancing the student learning experience through the provision of a flexible learning environment which integrates academic, physical, virtual and support resources. Academic services, libraries, learning technology, student study support and academics are working to bring about transformations which will develop active learners. Working within next-generation learning spaces, which integrate physical and virtual environments, and learning through inquiry-based approaches will underpin a stimulating and professionally rewarding education.

Because the relationship between research and undergraduate education in higher education has long been problematic, at undergraduate level terms such as 'inquiry-based', 'problem-based' and 'learning in research mode', are often used interchangeably to describe active learning approaches which encourage students to address a broad range of skills which can ultimately contribute to pure research capability but for many will describe skills which are transferable to a range of contexts within and beyond HE:

*The word research is used to cover a whole range of activities including very high level, professional focused research ... right through to a quick online search for references ... and everything in between.*

(Johnstone, cited in Lane, 2006, p23).

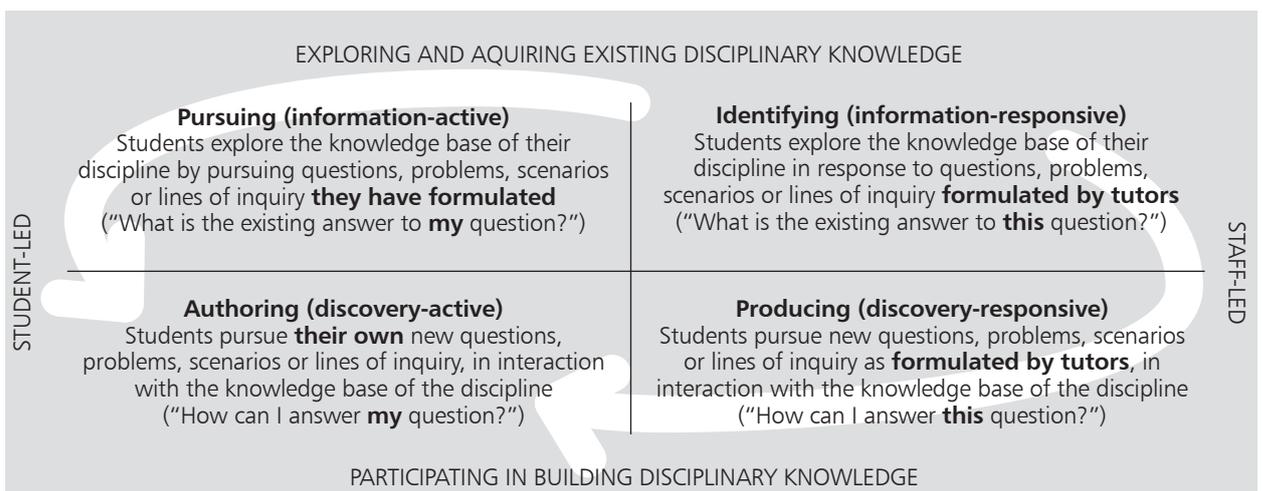
A useful framework for representing students' experiences of engagement with inquiry-based learning originates in qualitative research carried out at Sheffield by the Centre for Inquiry-based Learning in the Arts and Social Sciences (CILASS) (Levy and Petrusis, 2007). From students' accounts

of their experience of research and inquiry, two 'frames' emerged; the *information frame*, describing the exploration and acquisition of existing disciplinary knowledge, and the *discovery frame* where they participated in building on and contesting existing knowledge. In Fig 1 these two frames are represented by the vertical axis and a further dimension, classifying students' experiences according to the extent to which their accounts emphasised student or teacher-led processes, is represented by the horizontal axis (Healey and Jenkins, 2009). The term 'student-led' refers principally to the framing of the inquiry, and secondarily to the framing of the inquiry process, by the student. Similarly, 'teacher-led' refers principally to the framing of the inquiry, and secondarily to the framing of the inquiry process, by the teacher. The four sectors of the matrix thus formed differentiate accordingly between 'active' and 'responsive' modes of both information- and discovery-oriented inquiry, corresponding to four broadly differing experiences of student inquiry, characterised as: 1) identifying, 2) pursuing, 3) producing, 4) authoring.

Progression in identifying and formulating questions, and producing and authoring new knowledge, should be acquired over the course of an undergraduate degree. Inquiry-based learning designs can combine differing approaches. For example, during the course of a given inquiry task the dynamic of students' activity may well encompass both exploration of existing knowledge (the familiar experience of finding out about and understanding existing theory, perspectives) and building upon this to create new knowledge (new to them, or to the discipline at large) through analysis, experimentation, etc. Through an extended engagement with the inquiry process, students may move from initially a more teacher-led experience to a more strongly student-led one in later stages of a programme.

The *Research Skills Development Framework (RSD)*, developed at the University of Adelaide, (Fig 2) provides a useful model for describing progression in the development of 'research mindedness' at all levels and across all discipline areas (available online at [www.adelaide.edu.au/clpd/rsd/framework](http://www.adelaide.edu.au/clpd/rsd/framework)).

Figure 1: Inquiry-based learning: conceptions and approaches



Based on Levy (2009)

**Figure 2: Research Skills Development Framework (Adapted from RSD)**

<b>Autonomy</b>	<b>Level 4</b> Students research at the level of a closed inquiry* and require some structure/ guidance	<b>Level 5</b> Students research independently at the level of a closed inquiry*	<b>Level 6</b> Students research at the level of an open inquiry* within structured guidelines	<b>Level 7</b> Students research at the level of an open inquiry* within self-determined guidelines in accordance with the discipline
<b>Facet of inquiry</b>				
1. Students embark on inquiry and so determine a need for knowledge/ understanding	Respond to questions/ tasks required by and implicit in a closed inquiry	Respond to questions/ tasks generated from a closed inquiry	Generate questions/ aims/ hypotheses framed within structured guidelines	Generate questions/ aims/ hypotheses based on experience, expertise and literature
2. Students find/ generate needed information/data using appropriate methodology	Collect and record required information/ data and 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
3. Students critically evaluate information/data and the process to find/generate that information/data	Evaluate information/ data and the inquiry process using prescribed criteria	Evaluate information/ data and inquiry process using criteria related to the aims of the inquiry	Evaluate information/ data and the inquiry process comprehensively using self-determined criteria developed within structured guidelines	Evaluate information/ data and inquiry process rigorously using self-generated criteria based on experience, expertise and the literature
4. Students organise information collected/generated	Organise information/ data using a recommended structure and process	Organise information/ data using recommended structures and self-determined processes	Organise information/ data using structures and processes suggested by the guidelines	Organise information/ data using self-determined structures and processes
5. Students synthesise and analyse and apply new knowledge	Synthesise and analyse information/data to reorganize existing knowledge in standard formats.  Ask relevant, researchable questions.	Synthesise and analyse information/data to construct emergent knowledge.  Ask rigorous, researchable questions based on new understandings.	Synthesise and analyse information/data to fill recognised knowledge gaps.	Synthesise, analyse and apply information/ data to fill self-identified gaps or extend knowledge
6. Students communicate knowledge, understanding and the process used to generate it, with an awareness of ethical, social and cultural issues	Uses some discipline-specific language and prescribed genre to demonstrate self-selected knowledge and understanding from a stated perspective and for a specified audience.	Use mostly discipline-specific language and appropriate genre to demonstrate knowledge and understanding within a field from a scholarly perspective for a specified audience	Use the language of the discipline and appropriate genre to address knowledge and understanding gaps from several perspectives for a self-selected audience	Use the language of the discipline, choosing appropriate genre to extend knowledge and understanding, from diverse perspectives for a range of audiences.

## The contribution of research mindedness to graduate skills and employability

The CCCU Learning and Teaching Strategy (2010) identifies a range of graduate skills which are already mapped to students' experience within undergraduate programmes.

The CCCU Graduate Skills identify those values, attitudes, knowledge and skills, developed as part of an undergraduate experience, which support learning and study and contribute to employability and the profile of a CCCU graduate. These skills can be viewed through a variety of 'lenses' through which the student, or prospective recruiter, can evaluate the generic outcomes of a graduate's education. Graduates' ability to conduct inquiries and research is one such lens.

A possible implementation strategy:

- Undertake an audit of existing programmes against the progression suggested by Fig 2 *The RSD Framework*. This can be undertaken by programme directors and programme teams.
- Where students are not currently offered opportunities to progress across levels, the team review the curriculum, teaching and learning and assessment strategies.
- If minor modifications are required these can be planned into the quality cycle.
- Module outlines identify for students the research skills they will need, reinforced by tutors and feedback on achievement of the skills from assessment, set against the framework of progression provided.
- At Level 6 'capstone projects', dissertations and inquiry-based assignments provide summative feedback on achievement of the skills, within an authentic context.
- Progression and monitoring of students' experience of research will be reported through annual quality monitoring reports.
- Learning and Teaching Co-ordinators will facilitate sharing of developing practice at hosted LTEU meetings.
- Consultancy will be available from the LTEU.
- The study of the impact of these developments on student learning behaviours and outcomes are a feature of pedagogic research within departments.