

Inquiry-based Learning: key messages and a conceptual framework from CILASS (Centre for Inquiry-based Learning in the Arts and Social Sciences)



Inquiry-based Learning

'IBL' describes a cluster of student-centred learning and teaching approaches in which students' inquiry or research drives the learning experience and all tasks, resources and support are designed to scaffold their engagement with the inquiry process. Guided by subject specialists and those with specialist roles in learning support, students are encouraged to use the scholarly and research practices of their disciplines to move towards autonomy in creating and sharing knowledge.

A broad view of IBL sees it as encompassing related approaches such as problem-based learning (PBL), project-based learning and case-based learning. It can be used effectively as a means for students to acquire clearly-defined, 'certain' knowledge such as the conceptual foundations of a scientific discipline. Alternatively, it can be used to engage students with uncertainty and contestation through authentically messy, open-ended questions and problems. So, from one perspective, IBL can be seen as a form of active learning in which students carry out 'research-like' activities to explore and master an existing knowledge-base ('inquiry for learning'). From another perspective, IBL can be seen as extending towards and into the realms of 'real' research, positioning students as engaged producers or authors of knowledge with potential to generate intellectual and creative outcomes of value to their wider academic or professional communities ('inquiry for knowledge-building').

Approaches to IBL that emerged from CILASS activity are richly diverse in character. Examples of projects include: students exploring contemporary French art by designing a virtual exhibition, and producing learning materials by co-authoring a book (French); large cohorts of students working on problem scenarios and multimedia projects presented at a 'celebration of learning' event (Law); students making films about their in-progress archaeological fieldwork (Biblical Studies); students adopting new roles as mentors for others' inquiry activities (including English, Psychology); students participating in inquiry right from Level 1 induction week including investigating how to create a robot (Engineering); students collaborating more closely than ever before with staff on new compositions (Music); students extending the boundaries of evidence-based practice on placements (Dentistry); students investigating information behaviour in the virtual world, Second Life (Information Studies); students creating public art for Barnsley (Architecture). An exciting theme was the dissemination of students' inquiry outputs via conference-style events and publications.

CILASS also supported extra-curricular student-led IBL projects including the creation by History students of an online student journal, *New Histories*, and an extra-curricular undergraduate research bursary scheme.

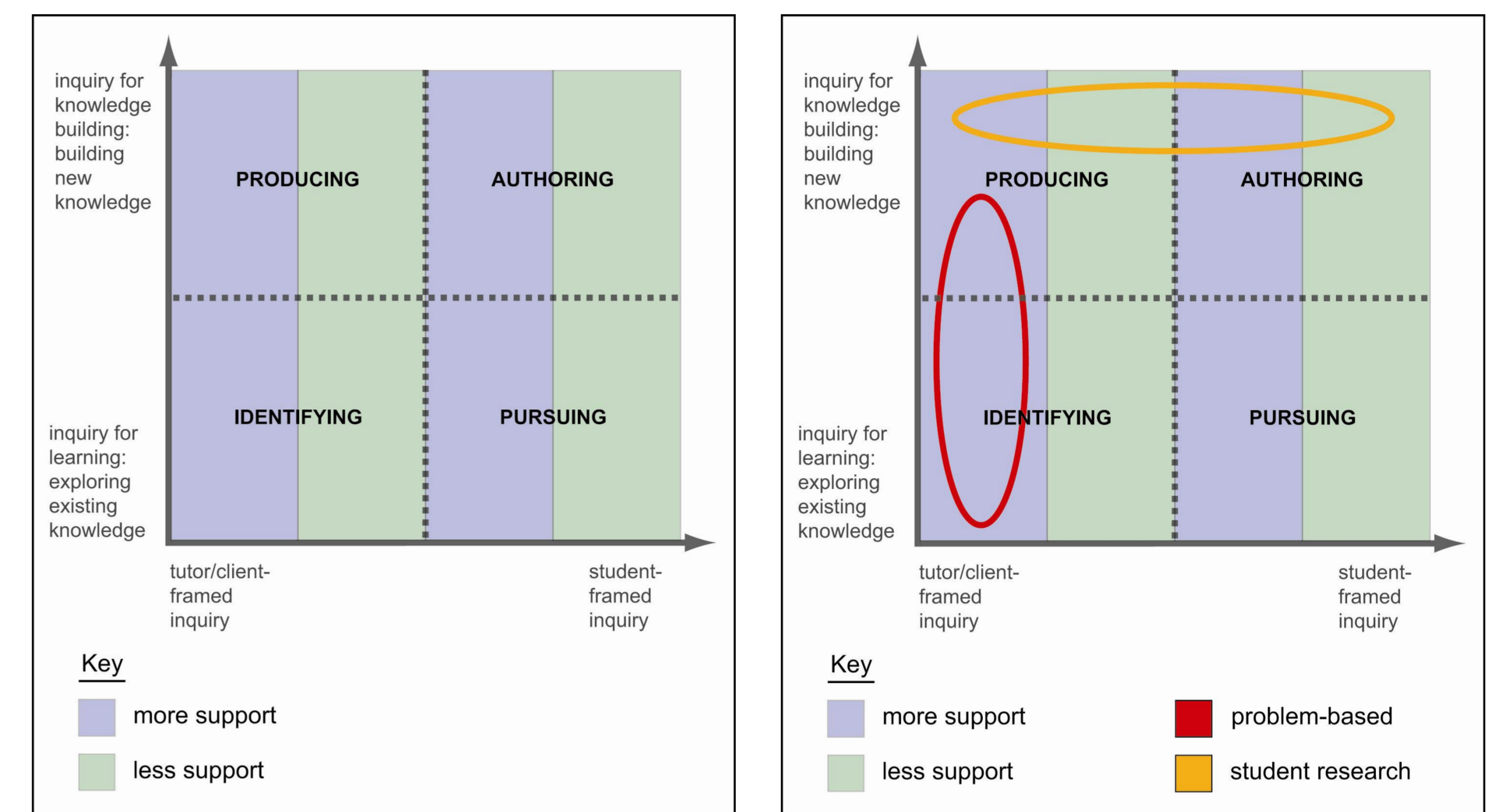
'Top 10' Messages about IBL from CILASS Evaluation/Research

IBL can have a powerful impact on students' intellectual, professional and personal development. Students experience benefits including greater enjoyment, engagement and confidence in learning and knowledge-building, and enhanced capabilities in areas including: self-directed inquiry; information literacy; communication; collaboration; use of digital technologies.
Introducing IBL at an early stage in university learning can have strong benefits in terms of motivation.
As well as developing students' subject knowledge and 'transferable' skills, IBL can in a positive way challenge limiting beliefs and understandings that students have about knowledge, learning and teaching.
Approaches to IBL that offer students opportunities to formulate their own questions and lines of inquiry can be especially powerful.
Students value the relevance of IBL to life beyond university. IBL addresses the expectations of employers by providing a context for the development of a wide range of skills for the workplace and lifelong learning.
IBL can be applied flexibly in different ways across different contexts of undergraduate and postgraduate education. The CETL demonstrated its value in pure and applied disciplines, and in interdisciplinary learning, from the first undergraduate year upwards. IBL can be used successfully with large as well as small cohorts of students.
Provision of carefully-designed orientation and support in response to student needs is essential for productive IBL. Students may struggle if appropriate 'process support' is not in place. For example, it is valuable to embed information literacy development explicitly into IBL, in the form of information literacy tasks and assessments.
Learning spaces can be designed specifically to support IBL, with positive impacts for both students and staff and closer partnership relations between them. Web 2.0 technologies can be effective in supporting student-led inquiry in ways that foster autonomy and creativity.
When promoting and extending IBL across different academic and professional disciplines it is valuable if a broad-based definition is used. At the same time, there is a need to communicate the distinctiveness of IBL in terms of the central role of the inquiry process in the student experience and the implications for learning design.
Extra-curricular IBL opportunities, in the form of IBL projects or research bursary schemes, benefit students and promote an integrated perspective on university provision for a 'research-led' or 'research-engaged' student experience. IBL can play a key role in university strategy to strengthen teaching-research linkages.

For further information and resources including Case Studies and 'The Sheffield Companion to IBL' see www.sheffield.ac.uk/ibl. Contact: Professor P. Levy, p.levy@sheffield.ac.uk

Designing IBL: a Framework

Successful IBL arises out of students' enthusiastic, questioning, purposeful, critical, imaginative engagement with well-designed inquiry tasks, effectively supported within an appropriate learning environment. The stimulus for an inquiry might, among other possibilities, be an intriguing field-work or design problem, a complex case scenario, or an important research question. In some cases, students establish the focus of their own inquiries; in others, the focus is framed by teachers or others.



Figures 1 and 2: Modes of IBL and relation with PBL and research (Levy, 2010).

Authoring: Inquiry tasks are designed to encourage students to explore their own open questions, problems, scenarios or lines of inquiry, in interaction with a knowledge-base ('how can I answer my open question?').

Producing: Inquiry tasks are designed to encourage students to explore open questions, problems, scenarios or lines of inquiry, framed by teachers, or others such as an external 'client', in interaction with a knowledge base ('how can I answer this open question?').

Pursuing: Inquiry tasks are designed to encourage students to explore a knowledge-base actively by pursuing their own questions, problems, scenarios or lines of inquiry ('what is the existing answer/response to my question?').

Identifying: Inquiry tasks are designed to encourage students to explore a knowledge-base actively in response to questions, problems, scenarios or lines of inquiry framed by teachers ('what is the existing answer/response to this question?').

This framework for conceptualising different modes of IBL has been found useful in the design and evaluation of IBL. Key dimensions of undergraduate students' experiences of inquiry, as these emerged from CILASS research, are represented as a matrix highlighting three broad considerations for learning design: the epistemic status of student inquiry (vertical axis); where primary responsibility lies for establishing the inquiry question or theme (horizontal axis); the amount of 'process support' (guidance and structure) provided (mapped on to each quadrant).

Four 'ideal type' modes of IBL are identified, labelled *Identifying*, *Pursuing*, *Producing* and *Authoring*. In each of these the nature and amount of process support will differ according to context. Important considerations for process support highlighted by CILASS evaluation and research evidence include: foundational and more advanced aspects of information literacy; question-framing and direction-setting; peer collaboration, reflection; formative feedback.

The dimensions on the matrix are continua rather than fixed binaries and, in practice, learning designs may fuse elements of different modes. The perspective on IBL represented here sees it as inclusive of PBL and student research, as mapped on to the framework in Figure 2. This conceptualisation of IBL offers a framework for planning progression in the inquiry curriculum through levels of study. For example, an undergraduate degree might be structured to lead students in a broadly step-based progression through *Identifying*, *Pursuing*, *Producing* to *Authoring*. However, a 'spiral' approach to curriculum planning for inquiry and research also may be adopted. CILASS research suggests that in arts, humanities and social sciences disciplines, inquiry tasks that offer first-year students experiences of 'bounded independence' - tightly-structured, small-scale tasks in *Producing* and *Authoring* modes - may powerfully support students' intellectual and personal development in areas such as academic or professional identity-formation, personal epistemology and self-belief.

IBL has not just been an integral part of the teaching on my degree course but has in fact changed my thinking about knowledge: how I gain it, how I extend it, how it is created. The reflective element of IBL has proved extremely useful and as a result has improved my marks and impacted on my way of thinking and going about applying for graduate jobs

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