

## Inquiry Learning

*Inquiry is at the heart of the University of Calgary's Institutional Learning Plan, and a central feature of course redesign. Instructors who want to foster inquiry in their classes put less emphasis on lectures, while incorporating more critical discourse, research, and group work. Discussion and reflection are critical features of the inquiry process.*

### ***Inquiry: A Process, Not a Product***

Inquiry is an approach to teaching and learning that focuses on the process of learning, rather than outcomes. Consistent with the previous definition, the Inquiry Learning Action Group (2005) has outlined a number of criteria that can be used to identify courses that are exemplars of inquiry-based learning.

#### Essential course features:

- Problem or question driven
- Involves critical discourse
- Requires self-direction from students
- Involves students in research activities such as information gathering, synthesis of ideas, and communication of research
- Evaluation of the student is aligned with inquiry learning goals

#### Features that enhance inquiry-based learning:

- Small-group work
- Multidisciplinary: students make connections not only between courses, but throughout a program of study and across disciplines

Inquiry learning may involve analyzing ill-defined situations and dilemmas that do not have simple solutions. Students examine questions or issues through group discussion and research, learn how to ask good questions, challenge assumptions, and apply concepts and skills to different contexts, thereby making new connections and forming new theories. Students acquire knowledge and skills by investigating genuine problems, such as project work or case studies. It requires them to be self-directed, use critical thinking and problem solving, and work collaboratively. Instructors often have to change how they approach content delivery, relying less on the lecture method while incorporating more active learning into the course.

### ***Fostering Inquiry in Undergraduate Courses***

Inquiry is a simple concept, but complex to implement. The following list includes some suggestions for making your course more inquiry-based:

- Put less emphasis on the lecture method of teaching
- Use questioning techniques that focus on higher-order thinking skills, such as evaluating a situation or applying a principle, instead of factual recall
- Ensure congruency in questioning strategies between in-class (or online) discussions, and formal assessment activities
- Avoid accepting a single statement as an answer to a complex question
- Prompt students to extend their thinking, communicate their ideas, see issues in a different light or consider other ways of approaching a problem
- Facilitate learner interaction through group work, discussion boards, and peer feedback
- Use appropriate technologies in your course, such as Blackboard, blogs, wikis, or the Peer Review Tool
- Promote learning as a process, not a finished product; for example, break an assignment down into stages, giving feedback and credit for each stage
- Contact the Teaching & Learning Centre for consultation in course redesign



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### ***Give Me an Example***

Students select a topic or area of study from an approved list. This can be an individual assignment or a group project. Alternatively, they may define their own specific research question from a general theme provided by the instructor. Then they begin to investigate their question. This can involve research, study, scientific experiments, observation, interviews, and so on.

As students work through the project, they learn the necessary factual knowledge while gaining new ideas and building new theories about the topic. They also make interdisciplinary connections and relate the learning to their own experiences. Instructors, TAs, peers and/or others provide feedback throughout the inquiry process. The inquiry process is iterative, not linear: Students might refine or reject their original research question as they progress through the project and learn more about it.

Discussion and reflection are a vital part of the inquiry process. Discussion allows students to share the results of their investigation, compare their thoughts with comments from others, and share personal experiences in order to make sense of their ideas. Through reflection, students examine whether or not they have reached an adequate resolution to their question, what other conclusions could be made, and what new questions result from the investigation.

At the end of the inquiry process, students communicate the results of their investigation. This can take many formats, such as an essay or lab report, presentation, cost analysis, due diligence report, or web page. They then evaluate their overall learning experience in the context of the assignment.

### ***Evaluation in an Inquiry-based Course***

Evaluation should give students the opportunity to demonstrate what they have learned as a result of their investigation, as well as the processes and skills used to generalize learning to other situations. Here are some ideas to get you started:

- Aim for fidelity between a course's learning objectives, teaching and learning activities, and student evaluation. For example, if your objective is for students to learn how to write scientific reports, course work will involve writing scientific reports and students will receive a portion of their grades from this work.
- Focus student evaluation on higher-order thinking skills, such as problem solving or applying new learning and skills.
- Use rubrics to develop grading criteria and communicate your expectations to students.
- Provide frequent and timely formative evaluation. It can come from instructor feedback, peer review, and/or self-assessment. It should be frequent and timely.
- Give credit for participation in processes such as peer review.
- Assign grades for the quality of student contributions to a discussion board, not the number of postings or words they have written.
- Ask a librarian to give students feedback and assign grades for the research portion of an assignment.

### ***Other Considerations***

- Provide rationale for using inquiry learning in the course, to promote student buy-in.
- Students need guidelines and well-defined parameters. Be clear about your expectations regarding course work and assignments.
- Set milestones for each assignment to assist students in staying on track and meeting deadlines.
- It takes a significant amount of time for instructors and TAs to provide the feedback, evaluation, and interactivity needed for an inquiry-based course.

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### ***Where Can I Go for More Information?***

#### **1. Inquiry and critical thinking – Reflective inquiry.**

Garrison, D.R. (n.d.).

<http://commons.ucalgary.ca/documents/ReflectiveInquiry.pdf>

#### **2. Institutional Learning Plan, University of Calgary (March, 2003).**

[http://commons.ucalgary.ca/documents/LP\\_Final\\_Mar03.pdf](http://commons.ucalgary.ca/documents/LP_Final_Mar03.pdf)

#### **3. Reinventing undergraduate education: a blueprint for America's research universities.**

Kenny, R. W. (1998). Stony Brook, NY: University of New York at Stony Brook.

#### **4. Teaching & learning through inquiry: A guidebook for institutions & instructors.**

Lee, V. S. (Ed.). (2004). Sterling, VA: Stylus.

#### **5. Inquiry Learning Action Group (ILAG) Action Plan. (2005)**

Calgary: University of Calgary.