Explanation

Lecture-based learning is typically deductive; students are provided with information about rules, theories, concepts, or processes and then, perhaps, are asked to apply their new knowledge. Inquiry-based learning (IBL; also known as inquiry guided learning or guided inquiry) represents an inductive approach in which "...students are presented with questions to be answered, problems to be solved, or a set of observations to be explained" (Prince & Felder, 2006, p. 9) and identify patterns or principles from that. "Students grappling with these challenges quickly recognize the need for facts, skills, and conceptual understanding, at which point the teacher provides instruction or helps students learn on their own" (Prince & Felder, 2007, p. 14). Inductive methods of teaching and learning serve to motivate students (Prince & Scheel, 2005), facilitate deeper learning of material (Ramsden 2003), and present the kinds of challenges that lead to intellectual development (Felder & Brent, 2004).

IBL is about involving students in the co-creation of knowledge by way of exploring questions or problems and reasoning through concepts, connections, and processes. In IBL, the instructor guides the inquiry process and students wrestle with ambiguity as a way of engaging deeply with material.

Inquiry-based learning ranges from a fairly structured and guided activity to one where students are more fully responsible for not only answering questions but formulating them. There are many ways to incorporate inquiry-based learning, many of which can be considered "small teaching" changes (Lang, 2016) that don't require a total overhaul of your course design or instructional approach.

Below, you will find information and resources on IBL teaching strategies, but before you delve into some specifics, you might want to check out some other resources that discuss IBL as an approach.

This article provides a very helpful overview of various inductive teaching methods, which could all be considered forms of IBL.

This article gives a detailed overview of IBL.

To hear faculty from Western Washington University talk about how they use IBL and to see IBL in action, view these videos.

- Inquiry-based Learning across Disciplines
- Classroom Environment with IBL
- Math as Inquiry Based Learning
- Developing community with IBL
- Role of the Inquiry-based Learning T1nm3 (me)9 >>BDC BT 0 Wf1/Link <</MCID

While the instructors featured in the videos linked above discuss IBL in STEM courses, IBL is an approach to teaching and learning relevant for most any discipline. Read more about the use of IBL in other disciplines in these resources:

- Inquiry at the Center of a Literary Criticism Course
- IBL in a Course on Human Trafficking
- Archer-Kuhn, B., Yeonjung L., Finnessey, S., & Liu, J. (2020). Inquiry-based learning as a facilitator to student engagement in undergraduate and graduate social work programs. Teaching & Learning Inquiry, 8(1), 187-207. https://doi.org/10.20343/teachlearninqu.8.1.13
- Atkinson, M.P. & Hunt, M.P. (2008). Inquiry-guided learning in Sociology. Teaching Sociology, 36, 1-7.
- Feldt, J.E., & Petersen, E.B. (2021). Inquiry-based learning in the Humanities: Moving from topics to problems using the oumanities imagination-e-Arts and Humanities in Higher Education, (2), 155-171. doi:10.1177/1474022220910368
- Friedman, D., Crews, T., Caldwell, J., Besley, J., Weinberg, J., & Freeman, M. (2010). An exploration into inquiry-based learning by a multidisciplinary group of higher education faculty. Higher Education, 59(6), 765-783.
- Van Oostrum, D., Steadman-Jones, R., & Carson, Z. (2007). Taking the imaginative leap: Creative writing and inquiry-based learning. Pedagogy, 7(3), 556-566.

Some teaching strategies to introduce or enhance IBL in your courses include:

- Structuring your course around "big questions"
- Using higher order questioning for discussions (in-depth guide provided below)
- Using problem-based learning (more information provided below)
- Incorporating student research

Using Higher Order Questions for Discussion

If you want students to be able to reason through knowledge and develop and use higher order cognitive skills like evaluation and analysis, then you must model and encourage this type of processing within your courses. A primary method to accomplish this is by using higher-order questioning. Reseaor is bg (d)-3.9 (3 ( )-)]TJ 3 ( )h (e)3 (is)2gtu

Bloom's (revised) Taxonomy can be helpful in formulating higher order questions for either purpose, though we'll focus on the former here

https://courseslumenlearning.com/suny-oneonta-education106/chapter/21-blooms-taxonomy/

While the fine distinctions in language that make a question one of analysis or evaluation are not terribly important, what is important is to ensure that the questions you pose to students push them from lower levels of cognitive processing (recall and understanding) to intellectual work that takes cognitive effort.

Below are some example questions about concepts from the discipline of Public Health and Bloom's revised taxonomy. You can see that the way students are being asked to think about information becomes more effortful as you go down the list.

Remember	What is it called when we intervene before health effects occur?
Understand	What's the difference between primary and secondary prevention?
Apply	Can you identify how each of these were used during the pandemic?
Analyze	How do the ways these were used during COVID compare to the ways they were used during the height of the Ebola outbreak?
Evaluate	Which of these approaches was more effective and why?
Create	What ideas do you have for primary prevention services going forward that would reach those most vulnerable to COVID?

Reflect on the kinds of questions you pose to students in class discussions and on discussion boards now; do they mostly stay at the levels of remembering and understanding? Do you often ask students higher order questions?

Asking students to apply, analyze, evaluate, and create will improve their ability to think critically and encourage deep learning; however, it is important to note that lower-level questions do have a place in inquiry-based learning and should still be used. The idea is to scaffold your questioning to take students from lower to higher level processing as they explore content.

Also very important to encouraging inquiry and higher order thinking are probing or follow-up questions that challenge students to further examine the material and/or their own thought processes. Once you start your question

- Bring and use the course text(s) during class, referring to the reading for answers or isolating parts of it to analyze with students. Model for students how they should use the text(s).

- Use questioning first, then "mini-lecturing".
  - This is one of the best ways to break into IBL if you're using it for the first time. Start class with questioning as the mode for getting into the content and then pause for short, interactive lecturing when you need to clarify, build on, or connect concepts.
- Respond to students' answers with more questions.
  - Challenge students to go deeper by asking things like, "What makes you think that?" or "How did you get there?"
- Reward students who ask good questions.
  - Explicitly encourage students to ask questions themselves. Provide positive feedback to students who ask questions in addition to answering them. Consider incentivizing good question-asking. You can require students to come to class with questions prepared, to come up with them in small groups, and to ask questions of each other, not just of you.

IBL in Online Discussions

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After you've drafted initial questions, consider how you might follow up with additional questions once one or more students have provided answers.

If you have any questions or wish to receive feedback on this practice activity, please contact your R.I.S.E. scholar or the Learning Academy.

Using Problem-based Learning

"Problem-based learning (PBL) begins when students are confronted with an open-ended, ill-structured, authentic (real-world) problem and work in teams to identify learning needs and develop a viable solution, with instructors acting as facilitators rather than primary sources of information" (Prince & Felder, 2006, p. 1). A defining characteristic of PBL is that before solving the problem, students work to understand and formulate the problem. Although the implementation of PBL can vary widely, it is typical in PBL for instructors not to provide students with information needed to solve the problem (i.e., an overview of relevant theories, concepts, findings, or principles) before assigning the task. When students determine that they need information to progress, the instructor will provide it or guide students to find it. Students should consider multiple solutions and, ultimately, make an argument for the solution

References and More Resources on IBL:

Barr, R.B., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, Nov./Dec., 13-23.

Elrod, S., Husic, D. & Kinzie, J. (2010). Research and discovery across the curriculum. *Peer Review*, 12(2), 4-8.

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