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INSTRUCTOR CHECKLIST – STUDENT METACOGNITION

The following checklist summarizes research-based recommendations for instructors who want to help student's use and develop metacognition. Summaries of the articles leading to these recommendations can be found in the *LSE Evidence-Based Teaching Guide on Metacognition*: <https://lse.ascb.org/evidence-based-teaching-guides/student-metacognition/>.

Identifying and Supplementing Students' Metacognitive Knowledge of Learning Strategies

- Identify the context in which students are learning, and how this context can influence which strategies students use versus should use. Students tend to study differently based on what they are expected to know and to be able to do, which stems from the alignment between course learning objectives, assessment demands, and expectations for in-class and out-of-class activities.
 - Ensure alignment between objectives, assessments, and activities, and discuss expectations for success to enable students to adopt appropriate strategies.
- Ask students what strategies and resources they use to study for exams, early in the semester and throughout. Asking students how they study will help them reflect on what they are doing and examine whether their learning strategies are effective. It will also help you know whether you should discuss how to incorporate more effective strategies into studying.
 - Ask students how they study through in-class discussions, reflective journals, study planning assignments, and post-exam evaluation assignments.
- Assess students' level of background knowledge on a topic in order to suggest appropriate strategies to increase learning. For example, concept inventories or instructor-made pre-tests can reveal prior knowledge. Students with less background knowledge can be supported in using surface strategies to build that knowledge. Once they have established that knowledge, they can use deep strategies to help them monitor their understanding and connect ideas.
- Discuss the benefits of self-testing, spacing, and interleaving, and how students can adopt them in their studying. These strategies promote retention of the material and they can help students be more intentional about their studying.
 - These discussions can be done with the class as a whole, and with students during individual meetings.
 - These discussions can also address misconceptions about which strategies actually work. Students may believe less effective strategies work well, even when their own results suggest otherwise.
- Incorporate self-testing, spacing, and interleaving directly into instruction. For example, create clicker questions, frequent quizzes, or make practice exams available (with answer keys), revisit previous topics in subsequent class sessions, and mix up the order of review topics.
- Provide direct instruction on evidence-based learning strategies by modeling the strategy, requiring students to practice the strategy, and when possible, providing feedback on students' use of the strategy. Direct instruction and feedback will allow students to develop the knowledge and skills they need to enact evidence-based learning strategies on their own.
- Discuss with students how they are using their study strategies, and whether they can modify some strategies to become more effective. For example, some may report that they review the textbook, but it is important to know whether they are passively rereading (less effective) or looking up specific information to check their understanding (more effective).

Supporting Students' Metacognitive Regulation: Monitoring and Control of Learning

- ❑ Caution students against using confidence alone to judge their own knowledge. Confidence does not necessarily indicate actual comprehension. Students should consider whether they can retrieve the information needed to answer questions, rather than making a snap judgment based on familiarity with the content.
- ❑ Use practice testing, along with feedback on the accuracy of confidence judgments, to reduce overconfidence in exam performance. Overconfidence on how well content has been learned can lead students to prematurely stop studying and to underperform on exams. Because practice testing improves retention and promotes monitoring of understanding, students will be able to more readily determine whether they know an answer based on whether they can retrieve relevant knowledge (and to what degree).
- ❑ Discuss appropriate times in which students could change answers to exam questions. Students should revisit questions they have low confidence in answering correctly. In this instance, confidence ratings are helpful because they indicate that a student should carefully reason through the question, and it could help students answer them correctly.
- ❑ Give students specific questions to help them evaluate their study plans, such as: “How well did your plan help you understand concepts?” and “How well did your plan help you apply concepts and make connections between concepts?” Students often struggle to evaluate their study plans on factors other than performance and their feelings of confidence, which are subject to distortion.
- ❑ Provide enhanced answer keys with your explanations of the best answers to questions and common mistakes students made in answering the questions. Include reflection questions to probe students about their understanding of the explanations in the key. For best results, explain how students should use this tool for their learning.

Building Social Metacognition

- ❑ Encourage students to invite peer feedback by giving them specific questions they can ask their group, such as, “What do you think of this idea?” and “Does my explanation make sense?”
- ❑ Encourage students to explore and even challenge one another's ideas by asking their group members questions such as, “What do you mean?” and “I don't think I understand; can you explain your solution?”

General Resources

Consult these excellent resources for additional ideas for supporting student metacognition.

- ❑ [Tanner, K. D. \(2012\). Promoting student metacognition. *CBE—Life Sciences Education*, 11\(2\), 113-120.](#)
 - This paper summarizes strategies instructors can use to (1) promote their students' metacognition and (2) be metacognitive about their own teaching.
- ❑ [Kornell, N., & Bjork, R. A. \(2007\). The promise and perils of self-regulated study. *Psychonomic Bulletin & Review*, 14\(2\), 219-224.](#)
 - This paper provides a bird's-eye view of the metacognitive decisions students make as they study and how challenging these decisions can be to navigate.