How do I support/facilitate development of critical thinking?

Case Study:
1000-level course; >50 students; primarily 1st semester freshmen

Course Description:
There is a general education requirement for First Year Composition at your institution. You teach ENGL 1101: First-year Composition I, the first course in the sequence. One of the required, essential student learning outcomes for the course is:

- Students will be able to think critically so that they can recognize the difference between opinion and evidence and be able to support a complex challenging thesis using evidence.

You have included several examples and explicit statements in your syllabus about what constitutes a reliable/viable source and what does not. You also dedicate an entire class session to proper citation, sources, and supporting a thesis with evidence. In addition, you help students practice this skill by asking them to support their class discussion with evidence and to cite their source.

Despite these strategies, the Department Head recently informed you that faculty from almost every discipline across campus reported that students who pass ENGL 1101 and 1102 are incapable of supporting a thesis statement with evidence or discerning between opinion and evidence.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I support/facilitate student engagement in the course materials?

Case Study:
1000-level course; >150 students; primarily 1st & 2nd semester sophomores

Course Description:
You teach PHYS 1211: Principles of Physics for Science and Engineering I. PHYS 1211 is a requirement for most undergraduate STEM majors, all the engineering majors, and the pre-health contingent. A large portion of students are pre-health and non-physics majors for whom this subject does not appear relevant, interesting, or anything but a waste of time.

The nature of introductory courses is to provide students with a large quantity of content and conceptual grounding in order to provide them with success in upper division courses (and in the case of pre-health students, the MCAT).

One of the student learning outcomes for PHYS 1211 is:
- Use mathematical models (graphs, diagrams and equations) to describe and explain phenomena in the natural world

To successfully complete this outcome, students must be able to use scalars, vectors and understand motion, velocity, acceleration, momentum, and oscillations. Only a handful of students are successful achieving this outcome, and you suspect it is because your students don't think the topic/outcome is important or relevant to their degree and career path.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I support/facilitate intrinsic motivation in my students?

Case Study:
2000-level course; >150 students; primarily 1st & 2nd semester freshmen & sophomores

Course Description:
You fully support the liberal arts focus of your institution's core curriculum and are thrilled that your course, ARHI 2300: Art History I: Cave Painting to Michelangelo, was selected to fulfill the Humanities requirement. As an undergraduate student, your Art History courses were transformative; forever changing the way you viewed and made sense of the world.

ARHI 2300 is popular, typically enrolling 3 sections of 150-160 students per semester. You are particularly passionate about the value of this learning outcome:

- By the end of the course students will be able to discuss and analyze art as the product of a particular historical period and/or culture.

In course evaluations, however, students complain about this outcome. In fact, it appears these students would prefer to simply memorize famous works of art and the characteristics distinctive of each style, rather than have to think about why that work of art could only be created at that particular time, in that particular space and culture, by that particular artist.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I measure student prior knowledge in order to meet students where they are?

Case Study:
2000-level course; >150 students; primarily 1st & 2nd semester freshmen & sophomores

Course Description:
You teach three sections of ACCT 2101: Principles of Accounting I per semester and typically have 300 students enrolled in each section. Students who enroll in your course are generally gregarious and business-minded. There are no pre-requisites, and it is a requirement for all business majors, who must take it in their first year. Typically, your course is viewed as a survey of the basic concepts and principles that underlie accounting systems, and not considered by you or your colleagues as particularly challenging.

One of the learning outcomes is:
- Students will be able to summarize and communicate information and data useful in making economic decisions.

The DFW rate for your course is very high and the Dean has taken an interest in improving student success in ACCT 2101. You realize students struggle with the ability to summarize and communicate using tables, figures and graphs, as there is no basic data literacy course pre-requisite.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I foster a learning environment that encourages student motivation?

<u>Case Study:</u>
3000-level course; >50 students; primarily 1st & 2nd semester juniors

<u>Course Description:</u>
You teach three sections of the very popular CMLT 3190: Myth in Culture course each semester. In fact, your course has recently been increased to an enrollment of 50 from the standard class size of 35 due to the high demand. Students from all disciplines want to take this course, however, some of them regularly miss class, since the only graded assignment is a final paper. Most of the real learning happens in class during discussions, interactions with other students, and wrestling with new ideas.

In fact, one of your course's learning outcomes cannot be achieved without participating in the class discussions.
- Student will recognize and communicate the power of myth in their lives and communities.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I support/facilitate knowledge application?

Case Study:
3000-level course; >150 students; primarily 1st & 2nd semester juniors

Course Description:
You teach a gateway or bottleneck course for many of the STEM majors; BCMC 3100: Introduction to Biochemistry and Molecular Biology. Students from various disciplines wait 2 years to have the prerequisite courses to take BCMC 3100. As such, students in this course are highly motivated and generally have settled into an identity as a 'science person'. Although they have had varying levels of success in prerequisite courses, BCMC 3100 is designed to help them learn to be better students by holding mandatory recitation and study group sessions. There are tutors and TAs provided by the Department.

Despite all these resources, students struggle. Particularly with this following learning outcome:
  • Students will be able to explain/describe the synthesis of proteins, lipids, nucleic acids and carbohydrates and their role in metabolic pathways.

You and your colleagues are concerned. Students appear to do well on the unit quizzes and can label parts of the various metabolic pathways, but they seem not to grasp the bigger picture, the underlying concepts behind these pathways and the systems governing synthesis of biomolecules.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I support/facilitate group work in my classroom?

Case Study:
4000-level course; <50 students; primarily seniors

Course Description:
You teach a performing arts course for seniors, DANC 4250: Performance Company III. Most of your BFA majors will go on to do other things, but a few might teach or dance with a second or third tier dance company. Even so, you feel it is important to prepare them with the skills essential for success as a member of a dance company or any large group. Therefore, you carefully designed your learning objectives to include:

- To develop collaborative and cooperative group skills in working with cast members, technical crew members, rehearsal directors, and artistic directors.

As a performance-based course, you expect students to take their training, rehearsals, and choreography seriously. However, some students seem to feel they should only be evaluated on their participation and performance because collaborative and cooperative skills are not explicitly taught and argue that you can't assess them anyway.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?

How do I support/facilitate a growth mindset in my classroom?

Case Study:
4000-level course; >50 students; primarily seniors

Course Description:
All seniors graduating from your institution's engineering programs *must* complete a capstone project. You were selected by the Department to teach BIOE 4910: Biological Engineering Senior Capstone Design I, the first in the 2-part capstone design project sequence. The goals and objectives of the course are very clear and standard across all engineering colleges.

The following objectives will be met in this course:
1. Combine previously learned engineering and scientific concepts to find solutions for real-world problems
2. Enhance critical thinking skills
3. Familiarize students with the engineering design process
4. Reinforce communication skills
5. Develop teamwork capabilities

Despite these objectives being clearly communicated, all graded student assessment relates to the design report and presentation. In fact, you overheard a student on one team speak over another student and say "all that matters is that our product is viable and our presentation smooth. Just let us tell you if we need your help and don't worry about the presentation."

Distressed, you wonder if more is needed than a single Leadership Program (5 meetings) to help students develop teamwork skills. Perhaps there is a way to incorporate these skills and their assessment into BIOE 4910.

How can you redesign or engineer student learning activities to help your students become proficient in this learning outcome?