Ideas and Resources for Teaching to ILO #2: Critical Thinking and Problem Solving

Assignment, Assessment and Activity Ideas to Support Students in Achieving ILO #2

- We work through many issues together that induce critical thinking. There is a section we work through regarding political cartoons that helps students apply current knowledge and analyze to answer questions about the cartoon. (ABE)
- Adding the videoing of instruction and writing in journals helps them to identify problems and then the class works together to identify strategies. (ART)
- The nature of ceramics and glazing is all about solving problems (ART)
- Critical thinking and problem solving added to exercises so that students can demonstrate how to apply what they are learning. In some cases this includes having students take a position or stance on an issue, other times it is reflecting on ethical concerns in course materials. Balance maintained between information-gathering-and-reporting types of exercises, and critical evaluation, asking students to suggest solution or offer insights to problems. (ATH)
- Students are asked to apply information learned in the course on a personal level which allows them to evaluate how curriculum relates to real-world experience. For example, when learning about genetic inheritance students evaluate their own phenotype in order to differentiate between polymorphic and Mendelian traits. Students' reaction to being able to see a direct link between academic assignments and the way they perceive family traits is powerful and gets them excited to apply more research in practical ways. (ATH)
- Students present their findings on their glaze tests to the class, comparing their glaze tests with the other students, and determining what went right as well as what went wrong. (ART)
- Marketing Plan (BA)
- Ethics program for the students' future or imaginary business. (BA)
- Students take the fact pattern presented and identify the legal issue(s) involved and apply the applicable law with explanation.(BA)
- Students apply business concepts and decide which to use and when and, more importantly, why. This can support the students in having conversations between themselves to further strengthen the concepts. This also helps the students realize how interactive these concepts will be inside an organization - "in the real world". (BA)
- Many times the answers to the case problems are not what a lay person without any knowledge of business law would expect. I encouraged students to think critically and not be swayed by their "heart strings." I also suggested to several that they would benefit from taking Writing 121 before taking this class since I tried to teach them to write concise, logical and persuasive arguments using the IRAC method of legal analysis which breaks each case into its Issue, Rule of Law, Application and Conclusion. When correcting their work I would encourage them to describe the relevant facts of the case; identify the issue at the core of the dispute; correctly define and explain the relevant rule of law; apply the rule to the facts at hand and come to a

conclusion that was logically supported by each of the prior building blocks of their argument. (BA)

- Students asked to develop their own experimental questions and strategies to answer the questions (BI)
- ILO #2 was addressed through updated group research project to highlight different strata of scientific research. They will explore these different study methods when deciding which research to cite. (BI)
- Students are provided resources and asked to discuss the resources in the online forum. In addition, students are asked how the topic pertains to them, what changes if any do they need to make, and how to make those changes. (CAS)
- Project based learning; reading the specific directions and then relying on the beginning Moodle OER lessons, course reference book and past experiences to design a project. Students are able to use what they already know to design their projects while learning about design principles. (CAS)
- Encouraging students to use real-world scenarios for their website projects (CAS)
- Weekly Moodle discussions are more robust than they once were. Discussions include students to share items from their perspective and experience, as well as look at solutions or options if something is not quite working for them, such as evaluating their workstation to be ergonomically correct, critically thinking about how their keyboarding skills will be used in the work environment, and evaluating, applying their proofreading skills, and discussing a variety of different proofreading techniques. (CAS)
- Critical Thinking/Problem solving - students used CGCC campus resources in the student portal (unofficial transcript and degree audit) and on the campus website (advising guides and program descriptions in the catalog) to become familiar with the course requirements for their majors, track their progress, plan future terms (short and long term). Then they researched websites for at least one of their transfer options for program requirements and advising guides to compare their academic choices at CGCC to see if they are on track to meet the academic requirements at their transfer institution. (CG)
- Gender Issues Assignment - compilation of gender issues and their impact on individuals and society (COMM)
- Use real life examples to motivate students to provide a reasonable analysis of theory in support or non-support of written media articles. This includes defining the situation and provide a forecast from economic supply and demand shifts. Exploration of different market structures sometimes involve global interactions. World events from the COVID-19 provided a real-life "lab experience" in applying theory and expectations. (EC)
- Project 2 required students to assess a program (relating to their inclusion practices for children with special needs) and then reflect on the results. Then they needed to articulate what they would change and why. In the future, I think the students should share their results with the class in order to have an opportunity to work on supporting their position further, to hear possible opposing views, and to have the chance to re-evaluate their position. (ECE)

- Ethical Situation Analyses require students to consider different perspectives and seek guidance within the NAEYC Code of Ethical Conduct to solve common challenging problems faced in ECE. (ECE)
- Final essay - the topic being to choose a controversial topic explored in early American literature, and compare its treatment in two diverse texts. (ENG)
- Their discussions required them to interact with one another and with challenging, sometimes oppositional ideas. Sometimes they had to synthesize, "problem solving" around how to let contradictory ideas exist at the same time. (ENG)
- The close readings and Analytical Essay required that students take a position about a topic I presented about each play. For example, in The Taming of the Shrew the overarching question was "Is Kate tamed at the end of the play"? Students took a position about that topic and used their idea in the reflective writing piece they completed for the close reading assignment. (ENG)
- Students required to take into account the historical, political and socioeconomic contexts in which texts were written. Students encouraged to defend their own ideas (ENG)
- Had students work in groups to develop wiki pages for Black poets (ENG)
- When reading articles, students are asked to refer to the evidence in the text when responding. The questions are text dependent. Students also were asked to do a formal presentation and frequently called upon to do pair presentations following a reading. Students were frequently asked for their opinion on specific journal topics and asked to support their ideals. Also, the main topic of the term involved much critical thinking about how to navigate the digital world with teenagers. The sharing of ideas brought us all to a different spot. Initially students were asked their opinion about the topic prior to study... after our discussions and readings many students changed their opinions. (ESOL)
- The short stories that we read throughout the term included a critical thinking component. We discussed what that meant each time we completed these activities. For ESOL students, this was challenging because they tend to find exact words and base their understanding on those, when sometimes, especially in literature, deeper thinking and evaluation is involved. We had some productive conversations surrounding this concept. (ESOL)
- Students required to formulate an abstract and clearly state the point/purpose/thesis of their paper (G)
- Critical Thinking/Problem Solving is advanced through the weekly Discussion Forums where students need to research a topic and communicate those findings to the class. There is also a chronic disease paper that requires them to seek out resources and use the findings to discuss how chronic disease risk can be reduced. (HPE)
- Students create a fixture and determine the methodology used to construct it (MFG)
- Taking students from the whiteboard and to applying their knowledge. Through the application of written manufacturing process, applied mathematics, as well as introducing basic metallurgy/chemistry, this course aided in the students' abilities in both quantitative literacy and critical thinking/problem solving. (MFG)
- Critical thinking is addressed in the mandated written papers for this course; I explain the connections through the Scoring Guides. (MP)

- Students use the Common Core Math Standards to develop appropriate graphs for appropriate grade levels (MTH)
- I have students do journal entries. They need to put in writing how they approached a problem and how they solved the problem. (MTH)
- Each student completed a project where they explained a mathematical formula or concept to the class. They made a brief slide show to share with the class. The use, history, and examples were required. MTH)
- There was a problem we did in class that was open ended as far as having an answer. I presented a scenario to the students and they needed to come up with questions that would help they meet the objective of the problem. They seemed to enjoy it and I was very pleased with the type of questions they asked in attempting to solve the problem. (MTH)
- While working on the quadratic story problem project, students have a number of methods by which they can solve the problem. We share these different techniques used to solve the problems. I have added a few small projects involving the history of the quadratic equation. (MTH)
- Several of my small assignments revolve around reading and critiquing articles that use data in some way, especially if it is used to draw conclusions.(MTH)
- Use of the question: What do you wonder about this? How can you find more information? Write your own problems to present to the class. (MTH)
- Critical thinking/Problem solving: connecting cultures of origin in musical style with dispersion of styles throughout the world, Spain with South America, British Isles with Appalachia and so on. (MUS)
- Nursing Care Plan (NRS)
- Time management Clinical assignment involves a reading assignment and video viewing assignment as well as a clinical observation. This assignment requires critical thinking and problem solving. (NRS)
- This is emphasized, in the clinical setting, in skills lab, in simulation, and in theory, where there is application of knowledge gathered about the week's topic (NRS)
- The student had to identify areas of their assigned drug that could potentially have adverse effects on the patient. Also, they had to think about what was occurring physiologically in the various disease processes and how the drug would affect the body. (NRS)
- Various aspects of care plans and patient preps require data analysis (e.g. patient assessment information, lab work in order to plan proper patient care, nursing/medical staff notification, for example). This ILO is also emphasized in skills lab and simulation lab, as well as in case studies done for theory prep. (NRS)
- The slide presentation project is a group project which involves research and group process work. Problem-based learning activities such as case studies are also used. (NRS)
- Critical Thinking/Problem Solving. Case based learning, discussion forums and use of probing questions help draw out critical thinking and important concepts. (NRS)
- Students are assigned a paper where they are given minimal information on their "patient" and they have to explore and discuss what they would want to know/do/ask about their patient.

They have to rely on the information they have learned in the 4 terms prior to this term and apply it to the NCP patient. There are different 'cultural' aspects that the student has to consider in this paper. (NRS)

- Students work on Concept Based Learning Activities (CBLAs) which asks them to incorporate theory re: nursing & pathophysiology with overall concepts which would affect a patient. (NRS)
- The students engaged in problem-based learning activities such as case studies which helped develop understanding of a disease process. (NRS)
- Case based learning, discussion boards, and use of probing NCLEX-style questions help draw out critical thinking and important concepts. (NRS)
- Students are presented with various work environment situations & challenges. Class discussions include solutions to problems and how students would handle certain challenging situations (such as, being older and/or younger in the workforce and looking for employment), Human Resources and Professionalism. Students are also asked to research Industry and Labor trends and develop a career choice essay, based on their labor trend analysis. Students are asked to evaluate their skill set as compared to job description of their choice and determine where they need to focus skill/experience building to get to the level they need to be to be qualified for the position they chose. (OS)
- All written documents must be independently created, no templates are used (other than for the resume/cover letter) and require students to critically think how to best create the document to present the needed information. This course also has two scenarios that require a huge amount of critical thinking and problem solving. In one they have to plan a business trip for a boss, where they have make sure they meet a preset criteria that has been requested (cost, type of accommodations, flights, times etc.). In the other scenario they spend multiple weeks planning a job fair that will be open to the community. They must find venues, food (for the presenters while thinking about cost and possible allergies), locate local business groups to attend, develop an advertising flyer and plan, as well plan all the details that will be required for having the event go smoothly (things like power, internet connections, name tags, parking etc.). (OS)
- Research Papers (PSY)
- We spend a lot of time looking at and discussing evidence based journal articles. We also use what we learn to identify strategies to integrate into our lives to solve problems. (PSY)
- Students are required to state their position on many of the theories and themes of the course and substantiate their positions using evidence. They are also required to apply the various theories to real life developmental situations and analyze which theories are most applicable (and why). (PSY)
- Providing evidence is required for all final research papers. Students are required to demonstrate that they can interpret information from the peer-reviewed journal articles to develop a comprehensive synthesis or analysis. (PSY)
- Students self-reflect over theoretical issues and how they apply to the real-world. (PSY)
- Students analyze and discuss data in a group modality. Research information from journals/books/websites/personal interviews and case studies are gathered individually. (PSY)

- Weekly analysis groups-research groups and individual and group in-class evaluations. After data collection students were required to present both personal and academic positions in regards to their subject matter. Weekly guidance and evaluations on their progress provided. (PSY)
- The student research groups were required to synthesize complex issues and to explore issues with imagination and reflections based on data and peer reviewed articles. They were also required to test theories with direct discussion-data review and community interviews. All of the students produced power points-art and creative question and answer sessions in order to educate other class members. (PSY)
- Students were required to evaluate and create group problem solving and the creation of solutions for research and data outcomes (PSY)
- Students are asked to state a position in the majority of the forums, then back up their position using evidence from the course content. Students are also constantly evaluating potential solutions. We spend a lot of time beginning responses with "it depends...." (PSY)
- Students answer critical thinking questions after each assigned reading. Sometimes the questions were assigned as homework, sometimes we discussed them as a group and sometimes students discussed them in pairs. Questions included (RD):
    - 1. Ironically, war create horrific effects in terms of human suffering and loss. On the other hand, it can also create economic growth and social change. What peaceful means can generate positive results without the negatives?
    - 2. If you were on the jury for a murder or rape case, would you convict a defendant on the basis of DNA evidence alone? Why or Why not?
    - 3. How have technological advances in food production or medicine, for instance, contributed to overpopulation and, consequently, to loss of natural resources?"
- Students present their research "research roundtable" -- they must explain their research and its implications in their own lives and the world. (RD)
- Students respond to different discussion questions that ask them to come up with solutions to some of the problems that exist in America's social institutions. I have been impressed with the creativity that some students have brought to their solutions. Students have come up with solutions to problems that I haven't thought of. (SOC)
- Use of MyRio in the Lab class focuses the students on problem-solving. These lab examples encourage and resulted in students asking deeper questions. (UAS)
- Students must evaluate potential solutions for humanitarian issues we study. (WGS)
- The journals cover this. Students must analyze and reflect in each weekly journal. This demonstrates critical thinking and growth in their thinking specifically. (WGS)
- Students were asked to review an online user manual for a product they currently own and operate, then write a memo assessing and evaluating the functionality of the manual. This assignment required students to address each of the eight measures of excellence in technical writing: honesty, clarity, accuracy, comprehensiveness, accessibility, conciseness, professional appearance, and correctness. Assignment guidelines are as follows: Assignment: Memo. Draft due by 11:30 pm May 24. Pretend I am the head of Customer Service for a manufacturing

company you work for, and I am concerned about whether or not the user manual for one of our products is functional. I have contacted you because 1) you work for me, and 2) I know you own one of our products. I'd like you to review the online manual for that product, then write me a memo analyzing and evaluating the effectiveness of that manual. Here's how: 1) Identify a product you own and operate in real life, and look online for a user manual for that product. (Most of your home appliances will probably have an online manual.) 2) Analyze and evaluate the manual based on all eight measures of excellence in technical communication, which are defined and discussed in Chapter 1 of the textbook. 3) Review ""Writing Memos"" in Chapter 14 of your textbook. Seriously. Also, review the Purdue Online Writing Lab's section on memos. (Google this if you don't have the handout. There are four parts: Audience and Purpose, Parts of a Memo, Format, and Sample.) Finally, review the Gaertner handout on memos. 4) Create some kind of appealing logo for our company. Remember—this will be the company that manufactures whatever product manual you are evaluating. In other words, if you're analyzing the manual for your iPhone, guess what? You work for Apple. Use your imagination to create a logo and/or use a template. There are lots and lots of templates pre-loaded in Microsoft Office. 5) Compose a memo communicating your analysis and evaluation of the effectiveness of the user manual. Your memo should include. . . a heading, complete with "To," "From," "Subject," and "Date", a clear statement of purpose, a summary of your findings, discussion of the manual (this will be the longest part), and a recommendation. The summary should include an assessment of the intended purpose and audience for the manual as well as the website address for the manual. The summary should also include a brief assessment of your evaluation of the manual. The summary is NOT designed to build suspense. Instead, summarize your findings here: Should the memo be revised, or not, and why? The discussion should include a brief, paragraph-long analysis and evaluation of each of the 8 measures of excellence in technical communication, for a total of 8 short paragraphs of discussion. Explain how well the manual met--or did not meet--the standard for each measure using examples from the manual. The recommendation should remind me whether or not you believe the manual should be revised, and why (but this information is also in your summary). The recommendation should ask to meet with me and include your contact info. Do not sign the bottom of the memo. Do not type your name at the bottom; your name goes at the top of the memo. Avoid language that is not specific. Strive for concise, professional language that is assertive and confident. (No ""I believe..."" or ""I think..."" or ""Maybe..."" statements.) Proofread, then revise and edit, then proofread and revise and edit again. Keep your memo 1-2 pages long. You're going to have to essentialize here and work on writing concisely. Print your memo on the logo you created for our company. Upload your memo by 11:30 pm on May 24. Also, print two copies of your memo and bring them to class May 25 for peer review. Grading: 30 points possible, based on clarity, conciseness, correctness, and comprehensiveness (did you get everything I asked for in the memo?).(WR)

- Create a How-To video to guide users through the experience of accessing a service at CGCC (i.e. ordering transcripts, completing FAFSA forms, accessing the PASS program). They worked in teams and each team determined a service for their video. One of the first steps in this process

was evaluating their service and determining what needed to be done to improve usability and student access (WR)

- We do free-writes at the start of class to identify and analyze problems. We read critically from a variety of essays, articles, blogs, videos, poems etc. from a variety of backgrounds and try to make connections(WR)
- I increased course requirements for linking and citing sources, created a course activity designed to help students determine veracity of online sources, and increased the number of assignments requiring students to identify the best organizational pattern to employ given different audiences and purposes. (Students seemed initially overwhelmed by the number of potential organizational patterns possible--most were aware of just the main four patterns of chronological, compare/contrast, cause/effect, and classification--but they responded well to learning another eight possible patterns and seemed to enjoy the freedom of making a deliberate decision regarding how to organize information as opposed to having the organizational structure predetermined.) (WR)

Resources, Assignment, Assessment and Activity Ideas Specific to Dimensions

Student Positions

Instruction Ideas

- Discussions on personal opinion
- Add “Student Position” to assignment grading rubrics

Activities

- Current event debates
- Ask students to provide cross-cultural perspectives
- Historical comparisons
- Family vs individual expectations and constraints
- Require students to take alternative positions
- Online discussion forms that elucidate debate
- Class discussions that take the form of a Socratic seminar
- Ask students to re-evaluate their position
- Essays focusing on supporting a position
- In class discussions where students have to determine their position and support it
- Develop hypothesis – prove wrong or right
- Set up debates with teams of students
- Discussion boards on issues
- During their presentations, as well as during other course assignments, the Student Position is provided and considered. This allows them to become better at developing their own positions.(BA)
- With regard to “Student’s Position” (Critical Thinking), students are required to be aware of and understand the uniqueness of their audience so their message can resonate with all listeners.

This requires a thorough analysis of who is in the room, forcing students to think critically about how they formulate and deliver their topic. (COMM)

- "Students Position"--The assignment about Lateral Reading instructs and teaches a series of habits that could be employed (in this case on the Internet) to better evaluate and responsibly consume and disseminate information. One of the intended outcome for this course is to "Understand many of the economic, legal, and social issues surrounding the use of information." In order to better meet this outcome, we ask students to learn about, and keep in mind, some of the barriers that come with the creation and dissemination of information, including how people -- including those as heterogeneous as our student population, seek out information, how it is shared, and how those roles hinder or affirm their biases. (LIB)
- Students are given a health care related law or statute that they must pick "for or against" (MA)
- Initial assumptions as positions (MTH)
- Physics of sound (MUS)
    - Pre-conceived ideas of cultural differences
- Students analyze patient data to prioritize patient care (NRS)

Resources

- Case studies of other people

Evaluate Potential Solutions

Instruction Ideas

- Directly instruct the linguistic forms of analysis and argumentation
    - "however", "as a result", "consequently", "therefore", "on the other hand" -- provide language scripts so that students can orally practice presenting a claim and a counter claim
- Train students to use media bias factcheck.org to evaluate their sources
- During lecture discuss (societal) problems – students request solutions. When no clear solution demonstrate critical thinking to discuss/analyze problem
- Present opposing viewpoints
- Train students in estimation skills in order to evaluate math solutions

Activities

- Comparison of methods through student presentations
- Causal analysis paper
    - Cause and effects – why? and/or what?
- Comparison/contrast
    - Cultures: Spanish
- Design activities in which students research information to present to class instead of providing the sources
- Giving open-ended activities allows students to sort their values and formulate reasons for their rankings – allows students to understand their values & others

- Provide pro-con articles to read and evaluate (Newsela, ProCon.org, Opposing Viewpoints from Gale)
- Ask students to justify and explain
- Writing assignments that require positions on “hot topic” issues such as gun control
- Offer math projects/activities that require students to evaluate computed data and use it to support choices or recommendations
- Evaluate other students’ papers/projects/decisions
- Ongoing projects (i.e. the big earthquake – tools to evaluate position progressively)
- In class small group work addressing benefit – cost grid
- Use of

Problem	Solution

- Capstone synthesis project
- Lab-work: compare hurricane warnings and aftermath
- Service Learning – send to opposing groups to observe
- Evaluating Potential Solutions comes about during in-class discussions about case studies and relevant news stories. (BA)
- Evaluate web sites that are not “optimized” for solutions to enhance optimization (CAS)
- Students were required to complete a forum post discussing the validity of a controversial claim using the CRAAP method. The rubric requires students to (CG) :
    - Gather your information: you will be expected to find evidence to either support the claim or reject the claim (4 sources total).
    - Apply the information (ask critical questions, explain how you came to your conclusion and why the sources you've consulted are credible using CRAAP)
    - Consider the implications (what are the effects of your position?)
    - Explore other points of view. (Discuss the opposing point of view and whether there is any validity to it)"
- With regard to “Evaluate Potential Solutions” (Problem Solving), one of the most common problems in public speaking -- aside from conquering fear -- is, as stated above, delivering a message effectively to your audience. A blended audience can pose a "problem" when students must deliver a single message to a group with diverse experiences, interests and levels of knowledge. Hence, the importance of in-depth audience analysis. (COMM)
- Practice Triage – ID main issue (MA)
    - Related concerns about diagnoses/meds
    - Best next steps
- Evaluate Potential Solutions- Case studies address this effort. Part of case studies require student to consider what he/she would do in certain circumstances, prioritizing in some cases, and discussing this in class either in small groups, as a full class, or both. (NRS)
- This year, in the OCNE program, the change has been to have the students to concept maps which deal with what is going on with the patient at that moment. They have to identify

potential problems, what interventions they will do to improve the health, and what they are watching for. (NRS)
- Students wrote a "proposal" essay in which they developed a solution to a problem (WR)

Resources

- Literature on problem solving
- Newsela, ProCon.org, Opposing Viewpoints from Gale

Influence of Contexts and Assumptions

Activities

- I have always emphasized assumptions in math modeling as it is the assumptions that determine which model we use. That is a hard one for students, so I stress it even more and try to get them to see why they have to pay so much attention to that. (MTH)