Definitions

Cross-disciplinary analysis – examines an issue typically germane to one discipline through the lens of another discipline (i.e., how physicists explore music, sociological perspectives on the purpose of religion).

Multi-disciplinary analysis – examines an issue from multiple perspectives, without making a concerted effort to systemically integrate disciplinary perspectives.

Inter-disciplinary analysis – examines an issue from multiple perspectives, leading to a systematic effort to integrate the alternative perspectives into a unified or coherent framework of analysis.

9-steps to prepare to become an interdisciplinary educator

1. DEFINE problems, issues, topics or questions that warrant interdisciplinary examination

2. PRESENT a clear rationale for taking interdisciplinary approach including the advantages to be gained

3. IDENTIFY relevant disciplines

4. CONDUCT a literature review (what is known on the topic from each of the disciplines)

5. DEVELOP a command of each relevant discipline set out the analytical structure central to each discipline, identify key underlying assumptions, and methods of evaluation.

6. STUDY the problem and generate insights including predictions from each of the relevant disciplines – in isolation!!

7. IDENTIFY conflicts between and/or areas of complementary between the insights offered from each discipline

8. CREATE common ground by developing a cohesive framework of analysis that incorporates insights from the relevant disciplines in a systematic manner.

9. COMBINE disciplinary insights to construct new more integrated understanding of the problem
How to Make Your Classroom Interdisciplinary

Effective design and implementation of interdisciplinary classroom explorations, regardless of the level or type of class, entails six key steps.

1. **Pre-Instructional Planning** – Prior planning establishes the topics to be examined in an interdisciplinary manner, and allows the educator to acquire the requisite knowledge, and to develop an action plan—codified in a set of notes that may include open ended questions—to guide the classroom experience.

2. **Introduce the Methodology to Students** – Explain to students the nature of interdisciplinary, rather than discipline based learning. Impress upon them the importance of integrating insights and approaches from multiple disciplines to form a framework of analysis that will lead to a rich understanding of complex questions. Make clear that you will be modeling how to approach an issue in an interdisciplinary manner, and that ultimately they will be asked to master this skill. Allay student fears by noting they will be given assignments that help them reach this objective by practicing approaching topics as interdisciplinary investigators.

3. **Take it to the Classroom** – Model how to explore questions from an interdisciplinary perspective. Repko and Welch (2005), leading figures in the movement to promote interdisciplinary education, identify 9 steps to follow to engage students in an interdisciplinary exploration (see below).

4. **Practice Interdisciplinary Thinking** – Students practicing interdisciplinary thinking by reenacting what they observe in the classroom is an effective way to acquire this higher order cognitive skill. Students can be assigned the task of rethinking an issue discussed in a discipline based manner in class by bringing another discipline to bear and then attempting to synthesize and integrate their analysis. In a small class setting (i.e. freshmen seminars, upper level classes supporting interdisciplinary programs, capstone courses) students can be asked to prepare *interdisciplinary position papers* for each assigned reading that extends the analysis to reflect the interdisciplinary process; consider other disciplinary perspectives, synthesize, and integrate. Collaborative forms of learning can be used to promote development of interdisciplinary analysis skills.
5. **Provide Feedback** – Extension and interdisciplinary position papers should be evaluated regularly using a rubric.

The aim should be to provide the students with feedback on their ability to understand and delineate the underlying structure and analytical framework of other relevant disciplines (*multidisciplinary thinking*) and to produce an integrated analysis (*interdisciplinary thinking*). Grading might simply identify the areas in need of additional skill development. Faculty student conferences may be necessary for those students struggling to master the integration element of interdisciplinary learning. The goal is for students to improve their capacity to think in an interdisciplinary manner over the course of the term.

6. **Assessment** – Students should engage in self evaluation periodically by rating their ability to:

- set out the structure of multiple disciplines that are well suited to the problem of interests,
- synthesize insights from multiple disciplines, and integrate ideas across disciplines. This information will allow them to gauge their progress, identify challenging areas, to seek help, and set goals for improvement.

**LINKS TO INTERDISCIPLINARY RESOURCES**

**SERC at Carleton College—Interdisciplinary Teaching Resources (Science Education & Resource Center)**


**Resources from Oakland University Association for Interdisciplinary Study**: [Website](http://wwwp.oakland.edu/ais/resources/syllabi/)

See also (within Oakland Univ AIS site):

**About Interdisciplinary**: https://sites.google.com/a/ualberta.ca/rick-szostak/research/about-interdisciplinarity

**Guide to Interdisciplinary Syllabus Preparation**

“**Assessing Interdisciplinary Learning Outcomes**” by Dr. Allen F. Repko, Univ. of Texas at Arlington

“**Designing Interdisciplinary Courses**” by Dr. William H. Newell, Miami University, School of Interdisciplinary Studies
Writing in your Discipline Assignment and Rubric, designed by Debra Parker, Univ. of Illinois at Springfield

**Assignment Prompt**

**Invention (Pre-writing) worksheet** and **Rubric**

**Sample Assignment** Integrating Sociology & Environmental Studies, with methodology & research from Emory & Henry College (*Journal of Sustainable Education*)

**Sample Syllabi with Interdisciplinary Components:**

**Language & Global Issues** (CAP 250) designed & taught by Dr. Debra Parker, University of Illinois at Springfield

**Interdisciplinary Writing** (CAP 115) designed & taught by Dr. Debra Parker, University of Illinois at Springfield

**Religion, Science and the Quest for Meaning** (HON 3392) designed & taught by Dr Christopher Frost, Texas State University

**The Gothic Imagination** (IDST 2305) designed & taught by Dr. Robert Viau and Dr. Greg Pepetone, Georgia College and State University

**Environmental Psychology** (SSLH 100) designed & taught by Professor Daniel Stokols

**San Francisco State University, Center for Teaching and Faculty Development**

**Suggestions for Interdisciplinary teaching & resources**

**Pedagogy in Action, Science Education and Resource Center at Carleton College**

**Challenges to Overcome in Interdisciplinary Teaching**

**Best Practices in Assessing Interdisciplinary Learning**

There are two widely recognized means of assessing student ability to analyze in an interdisciplinary manner; the *pre-and-post student survey* method, and the *grading rubric* approach. Student surveys can be designed and used to capture perceptions (subjective information) and the capacity to think in an interdisciplinary manner (objective information). Grading rubrics provide objective feedback on the status of both multidisciplinary and interdisciplinary thinking.
Pre-and-post Student Surveys - can be administered to students at the beginning and again at the end of the course to explore their level of understanding of fundamental principles in their disciplinary major, in relevant related majors and their capacity to synthesis and integrate across disciplines. This information can then be used to identify if a gap exists between perceived and actual understanding both at the beginning and at the end of the class. The exit survey can also include questions on whether they thought the interdisciplinary form of instruction was worthwhile or if they believe they would have experienced greater knowledge gains if the pedagogical approach was confined to a single discipline.

Grading Rubrics - are most effective when used in a two-step method. First, students are asked to analyze an issue or problem using the analytical framework of at least two disciplines. This entails multidisciplinary analysis since integration and synthesis is absent. Second, students are now required to present an interdisciplinary analysis of the same problem, using a synthesized framework that integrates the disciplinary insights used in the first step. The grading rubric is used to evaluate both multidisciplinary and interdisciplinary skills.

See the VALUE Rubric, Integrative Learning, from AACU

--from Pedagogy in Action, SERC at Carleton College

Assessment of Interdisciplinary Learning
4 Dimensions of Interdisciplinary Understanding:
- purposefulness
- disciplinary grounding
- integration
- critical awareness

Purposefulness: “degree to which students exhibit clarity about the aims and audience of their interdisciplinary writing.”
Guided by 2 questions:
- a) “does the framing of the problem (topic) invite an integrative approach?” paper indicates disciplinary dimensions with a clear scope and purpose
- b) “does the writer use the writing genre effectively to communicate with its audience?” able to integrate potentially contrasting forms of writing/research form different disciplines, must “work across genres must maintain coherence”

Disciplinary Grounding: “examines students selection, understanding and use of the bodies of expertise that inform their work.”
Guided by 2 questions:
- a) “does the paper use disciplinary knowledge accurately and effectively (e.g., concepts, theories, perspectives, findings and examples);
- b) “does the paper use disciplinary methods accurately and effectively (e.g., experimental design, philosophical argumentation, textual analysis, etc.)?”
**Integration:** “student’s capacity to integrate perspectives [...] how perspectives are selected, how connections across disciplines are framed, how they are articulated into a coherent whole, and what the advantage is of such an articulation.”

**Guided by 4 criteria:**

a) “does this paper includes two or more disciplinary perspectives and insights relevant to the paper’s purpose?”;

b) “is there an integrative device or strategy (e.g. a model, metaphor, analogy)?”;

c) “is there a sense of balance in the overall composition of the piece with regard to how the disciplinary perspectives are brought together to advance the purpose of the piece?” the piece need not give equal time to each discipline, the purpose should dictate the balance;

d) “do the conclusions drawn in the paper indicate that understanding has been advanced by the integration of disciplinary views?”

**Critical Awareness:** “student’s ability to take a meta-disciplinary perspective on their interdisciplinary work and its limitations [...] degree to which students reflect explicitly about the craft of interdisciplinary work.”

**Guided by 2 questions:**

a) “does the paper exhibit awareness of the limitations and benefits of the contributing disciplines and how the disciplines intertwine?”;

b) does the paper exhibit self-reflection?”

--From “Targeted Assessment Rubric: An Empirically Grounded Rubric for Assessing Interdisciplinary Writing” By Veronica Boix Mansilla; Liz Dawes Duraisingh; Christopher R. Wolfe; Carolyn Haynes. Full paper available on-line through Evergreen State College.