

COURSE CODE: BIOL13100

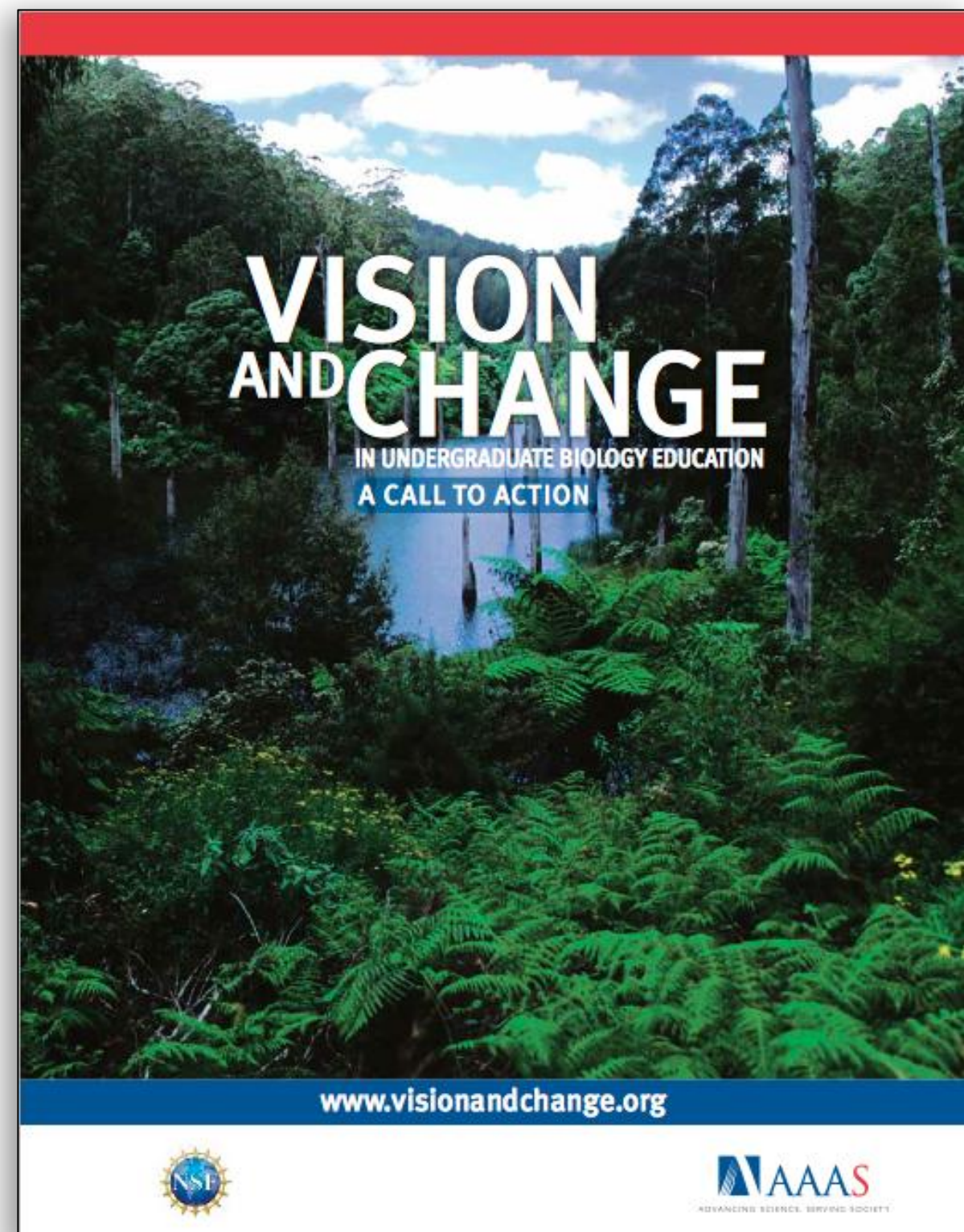
COURSE TITLE: Development, Structure, and Function of Organisms

INSTRUCTOR: Dr. Nancy Pelaez

Course Learning Objectives:

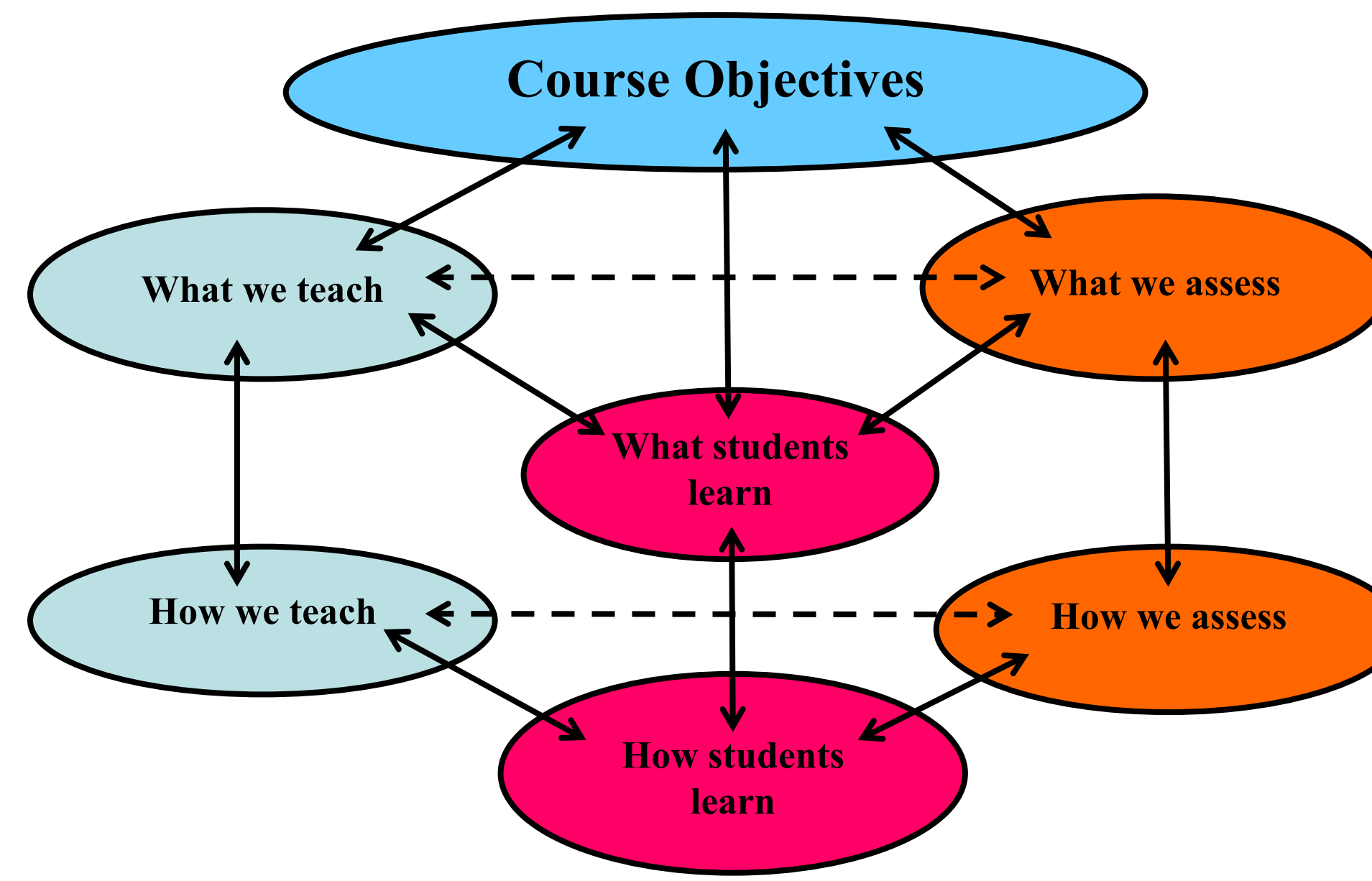
- In addition to traditional objectives covering the Physical and Chemical Basis of Life, The Molecular Basis of Regulation, Plant Biology, Animal Biology, and Experimental Biology, this course also covers:
1. Exploring biological information sources to answer a personal question
 2. Developing a personal strategy to find information needed for a biological problem (skill)
 3. Modifying strategies for finding information by reflecting and then deciding how to improve a strategy
 4. Reflecting on the quality of biological information you find and evaluate how useful it is for your question
 5. Finding and interpreting biological examples to illustrate what you have learned to a specific audience
 6. Using biological information to respond to ideas presented by others or biological issues of social relevance

Goals and Intended Outcomes



- Vision and Change (AAAS, 2011) calls for making undergraduate courses more student-centered and relevant.
- To make the learning in a biology course for first-year undergraduate students as inclusive as possible for students from a range of backgrounds and interests, we:
 - Introduced the practices that "inform" biology professionals
 - Explicitly addressed the potential for students to inform themselves in a biology course.

Not Just WHAT Students Learn, But HOW Do Our Students Learn Current Biology?



SOURCE: Anderson, T.R. (2007). Bridging the Educational Research-Teaching Practice Gap: The power of assessment. *Biochemistry and Molecular Biology Education* 35 (6): 471-477.



Weekly Assignments and Reflections

Week	Assignment	Team 1 Peer Leader Reflections	Team 2 Peer Leader Reflections	Student Peer Choice
1	Content - Compare amino acid structures (primary, secondary, tertiary) and explain how they relate to protein structure.	All students participated but the peer leader noticed the student who plans to become a nurse. They were able to answer questions on the topic.	Initially, this was a very difficult topic for the students. However, after the peer leader explained the concepts, they were able to understand it.	NA
2	Competency - Focus on the graphing skills needed for a research study while getting and reading a journal article.	When discussing the graph, peer leader noticed a student who was struggling to understand the graph. The peer leader encouraged students to talk.	Students were able to describe the graph. The peer leader noticed that the student who was struggling to understand the graph was able to understand it.	NA
3	Content - Get a primary source article and compare it to a secondary source article.	Different ways that students view the same information. Very focused group according to the peer leader.	Students were able to describe the article. The peer leader noticed that the student who was struggling to understand the article was able to understand it.	NA
4	Social Impact - Focus on research related to a current biological issue.	Research is important to the research question that relates to their own goals.	The quality of student talk was really pretty good. They were much more comfortable with each other and are becoming closer.	NA
5	Personal relevance - Understand an experiment. The information from the article is about something you are about to do in your course.	Students used Google Scholar to find an article. Peer leader noticed that the student who was struggling to understand the article was able to understand it.	Students were able to describe the experiment. The peer leader noticed that the student who was struggling to understand the experiment was able to understand it.	None yet
6	Learning to learn - Use the information from the article to answer a question.	Peer leader helped with the information from the article. Students that did not understand the article were able to understand it.	Students were able to describe the information from the article. The peer leader noticed that the student who was struggling to understand the information from the article was able to understand it.	None yet
7	Content - Current research in a biological field.	Mar 20 Students had not done a research paper. The peer leader noticed that the student who was struggling to understand the article was able to understand it.	Students were able to describe the current research. The peer leader noticed that the student who was struggling to understand the current research was able to understand it.	None yet
8	Competency and Learning to learn - Present your data from an experiment and make a conclusion.	Students were able to describe their data. The peer leader noticed that the student who was struggling to understand the data was able to understand it.	Students were able to describe their data. The peer leader noticed that the student who was struggling to understand the data was able to understand it.	None yet
9	Behavioral - Design a research project and explain it to a group.	Students were able to describe their research project. The peer leader noticed that the student who was struggling to understand the research project was able to understand it.	Students were able to describe their research project. The peer leader noticed that the student who was struggling to understand the research project was able to understand it.	None yet
10	Peer Presentation			None yet

Peer-Led Team Learning (PLTL)

- Information literacy assignments were added to the weekly problem sets
- Emphasizing the social aspects of learning, students worked together in small groups led by a peer mentor using online or face-to-face meetings.
- Peer leaders (PLs: undergraduates & a grad TA) were recruited and trained
- PLs led weekly small-group sessions to work through problem sets and projects
- Students considered personal and social relevance of biological information through an informed learning approach
- Students explored biological information sources to answer a personal question
- Students developed a personal strategy to find information needed for a biological problem (skill)
- Students modified strategies for finding information by reflecting and then deciding how to improve a strategy

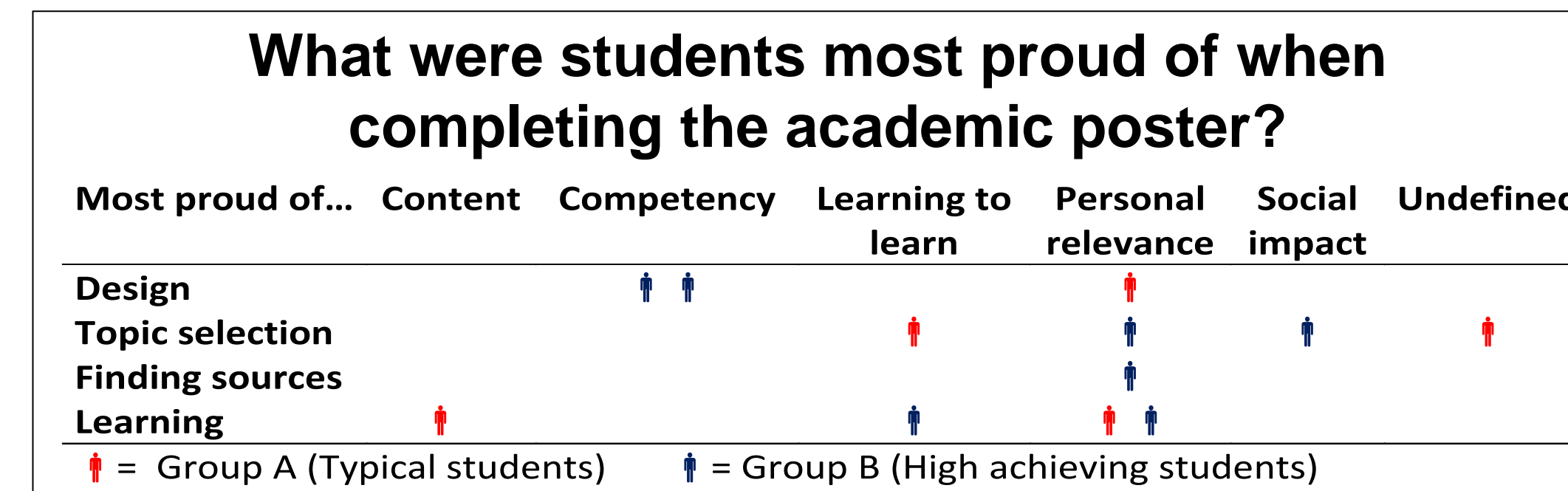


Christine Bruce introducing the Six Frames, Aug 2012

Bruce, C. S., Edwards, S., & Lupton, M. (2006). Six Frames for Information Literacy Education: A conceptual framework for interpreting the relationships between theory and practice. *ITALICS (Innovations in Teaching and Learning Information and Computer Science)* 51(1): 1-18.

Student Benefits from the Six Frames of Informed Learning

- Students develop a personally relevant question that can be answered by engaging biological information.
- Informed learning approaches help students consider personal and social relevance of biological information.
- PLs develop leadership, instructional and observational/listening skills as well as biological expertise and confidence.



Personal accomplishments & 6 Frames		
Frame	Number	Percentage
Competency	22	46%
Learning to learn	7	15%
Personal relevance	8	17%
Social impact	4	8%
Content	2	4%
Undefined	3	6%

Examples from peer reviews of Group A and Group B posters

- No cure has been found (Social impact)
- Brother has Crohn's Disease (Personal relevance)
- Provides info on how brain interprets auditory signals (Content)
- May lead to therapies (Social impact)