



A Blended Learning Approach to Philosophy of Science Teaching

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The course in 2014

Background

The course *Philosophy of Medicinal Chemistry and Molecular Medicine* is a mandatory, 5 ECTS bachelor course with 7x3hour "lectures" and 7x3 hour discussion classes run by TAs, who are recruited among previous participants in the course.

Teaching goals

Upon completion of the course, the students should be able to:

- Identify and describe important characteristics of molecular medicine and medicinal chemistry.
- Analyse molecular medicine and medicinal chemistry using concepts and cases from philosophy of science.
- Reflect critically on molecular medicine and medicinal chemistry and their implications for society.

Topics

- What is science? • Scientific methods & misconduct
- Causality • Limits to knowledge
- Theory and reality • Science and values
- Science & society • Science and values

Teaching methods

In addition to lectures and group discussions, most seminars are run as *matrix group discussions* where:

- Each class is divided into 6 groups.
- Each group prepares one of three different assignments based on lecture material or additional texts.

Matrix group discussion process

1. Each group discusses their answers to the assignment prepared from home.
2. The groups are mixed. Students present the answer to the assignment of the original group to the members of the new group, who have worked on different assignments.
3. Back to the original groups. Each group prepares a presentation of an assignment they did not prepare from home, but heard others present.
4. Presentation and discussion.

Mandatory assignments

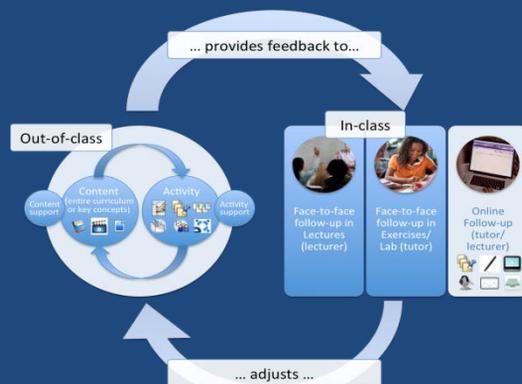
- The course also includes two mandatory *written assignments* that go through in-class "peer review" and are discussed in general by lecturers.

Modifications for the "blended" 2015 edition

Aims

1. To increase the quality and quantity of students' out of class work.
2. Increase the quality and quantity of personalized feedback on written work.
3. Increase the students' outcome of the personalized feedback
4. Reduce the time spent by teachers on *presenting* abstract theory.
 - And increase the time spent on *discussing* cases and applications.

The STREAM model for blended learning



Achieving the aims through blended learning (hopefully)

- Turning lecture presentations into 10-12min videos available on the course Blackboard site (Aim 4).
- Embedding the videos in *learning paths* with quizzes and small essays that test the students conceptual understanding.
- Additional "Test your understanding" learning paths in relation to the weekly readings.
- Learning paths should be completed before the discussion classes, are corrected by the TAs using lecturer defined *rubrics*, and must all be passed in order to take the exam (Aims 1, 2 & 3).
- Peer review of mandatory assignments is handled through Blackboard and done out of class. Students are then asked to revise their essays and hand them in to the TAs, who correct based on a lecturer defined rubric (Aims 2 & 3).

Additional benefits

- Students can be separated into various groups e.g. disciplines and matrix groups, and learning paths can be made group specific.
- For a given topic we can e.g. make one learning path for medicinal chemistry and one for molecular medicine.
- Helps us increase the relevance of the exercises.

Long term aims

- Introduce blended learning in the other courses in philosophy of science for scientists.
- Develop a pool of video material that can be used across courses.
 - Perhaps featuring distinguished guests.
- Make the learning paths part of the exam.