

May 15, 2006

## CHM 621

### Methods in Chemical Education Research: Elements of Effective Teacher Enhancement Efforts (2)

**Course Goal:** to examines issues involved with effective chemical education teacher enhancement initiatives by exploring pertinent research findings, review on existing MU program(s), and apply research based protocols and accepted best practices in designing and conducting a teacher short course.

**Student Center Experience:** This course will involve you in a search and review of the literature. It will be your responsibility to seek and prepare answers to focus questions and related assignments basing their responses and critiques on recently reported research findings. (It is strongly recommended that you use this search to begin you own library of research articles in this field. This help you successfully meet the objectives of this course, prepare for the comprehensive exam, and completion of your dissertation.)

NOTE: All aspects of this course should be completed and turned in before **July 26.**

#### Assessment Instruments & Assignments:

1. *Guest Presenters Models for Teaching and Learning--- Spring Follow-up*
  - a. Part A: For each of the guest presenters you observed at the follow-up, prepare a 1-page summary of their pedagogical goals and teaching methods used. Then write a 2-3 page critical comparison of the various methods, the teachers reactions to them, and your perception of the effectiveness of each. (Due via email by **May 22.**)
  - b. Part B: After you have completed the Focus Questions (see item 2), revisit the paper you prepared in Part A with the goal of finding evidence from the literature that support the goals and methods used by the guest presenters AND the critical comparison you originally prepared. Prepare a revisit document which presents a critical analysis of your original work based on the literature you have read. Be sure to properly cite reference. It is ok to change your evaluation of the effectiveness in this process. (Due via email by **Jun 12.**)
2. *Focus Questions (Q1-4 due via email by Jun 2)*

These are designed to provide you an overview of the literature on teacher enhancement programs as well as to have you begin to grapple with the key issues confronted in this field.

Prepare a **concise**, yet **critical** review (typically ~1-3 pages) summarizing your response and appropriately and **thoroughly documenting** the reference information. *Include at least 1 reference that is more recent than 1996 for each question you are assigned.* Minimize the use of undocumented options (stating options of previous persons in the call does NOT count as published research).

After you have turned in your answers, we will schedule a day to discuss the. You should a short statement summarizing your findings and be prepared to answer questions on these. You will be graded on the effectiveness in responding to the focus question, the thoroughness of your review, and your ability to respond to questions during the discussion.

3. *Evaluation Assignment (due via email by Jul 7)*

Before you start assisting with the Ashland and MUM workshops this summer carefully read the article

I published in JCE, "Recommendations for Succeeding in Professional Development Programs for Teachers" (this is on our web site at <http://www.terrificscience.org/aboutcce>) Also read the grant proposal that funded the OBOR project you are observing at MUM and the Evaluation Report submitted to the funding agency for last years program. As you assist with these workshops, take notes on the pedagogical methods that are used to engage teachers as a special group of adult learners.

You will probably note that we have grown over the years and expanded our model as well as the methods used to implement our goals. Write a critical analysis of the workshops you observed. Point to at least 4 articles NOT included in our grant proposal that have published since 1999 that justify or refute the methods you observed. Include a summary of the ways you think the CCE model has changed with time.

4. *Design 2-day teacher enhancement academy* for middle and/or high school teachers. You can select the topic and general focus of the academy. However, your academy must incorporate overarching theme that ties chemistry to consumer or industrial issues such as food science, transportation, environment, economics, history, home health and safety, recreation, etc. As you build the curriculum for the academy, be sure to incorporate best practices for teacher professional develop including active, context-based learning; strategies for increasing pedagogical content knowledge; methods of assessing for learning rather than assessment of learning; etc.

In your report on your academy, be sure to provide pedagogical goals, planned activities, assessment strategies, and anticipated outcomes. Provide instructor notes that explains how each activities should be carried out, now it ties to the general theme, and the instructional goals for incorporating this into your curriculum. Provide references to previously published lessons, experiments, demos, etc, that you include. If you propose to include new lessons or materials you would develop for this academy, provide a detailed summary of what these would be. You are not expected to complete the actual development of such new materials, rather to describe in detail what they would be and why you have included them in the lesson.

NOTE: You are not expected to teach this academy.

The curriculum you design should include all aspects called for in the Wiggins & McTighe Curriculum by Design book including a statement of curriculum priorities and desired results, methods you'll use to determine if these goals are meet and understanding attained, and an instructional plan including learning experiences to be provided.

To accomplish this assignment you will be expected to:

- a. Read the Curriculum by Design book and review the lesson source materials. You are responsible for creating the curriculum for the academy. You should met with me to share your work in progress including your goals, general thrust, and key elements you plan to include to accomplish the goals of the Backward Design model. This should provide you a calibration point and an opportunity for feedback before you have completed the assignment.
  - b. Email your completed curriculum plan to me by **Jul 14**.
  - c. After I formally review your work, I will provide you with a written critique pointing indicating both the strengths and weaknesses of your plan..
  - d. You should then revise your curriculum plan based on this review. Final draft due **Jul 24**
5. Final exam Due by **Jul 26**

Part A: Justify the reasoning used for the final version of academy's curriculum including detailed reasoning for the content, pedagogy, and scope & sequence of activities planned for your academy **by providing detailed reasoning and appropriately cited literature** for each aspect of your plan.

Part B: Answer Question 5 of the Focus Questions being sure to **cite reference and avoid personal options that can not otherwise be referenced thru the literature..**