Case Study 2
Design Learning Experience for Middle School Science Teachers

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This project is to design a constructivist approach to teach middle school science teachers to use constructivist method to teach science.

According to Dr. Oakes' requirement, I plan to use **Project Based Learning** approach to teach the learners the new teaching method. The learning outcome is an open-ended project -- their own constructivist teaching plan. The motivation factors for the learners are 1) they will be able to test their project in their own classes; 2) they will be able to contribute to the learning community via online forum. The forum and the classes also serve as self-assessment tools for the learners to revise their learning process.

I will use a **system approach** (Brach 1996, Reiser and Dempsey) to design and develop the project. I particularly like the **formative evaluation, pilot testing** and **summative evaluation phase** of this model. This process will work well with Dr. Oakes' interest and time restriction. Dr. Oakes will be involved in formative evaluation phases of the project. After implementation, Dr. Oakes will get summative evaluation data for her research. The pilot testing will be conducted in a small group of local leaners. After the product passes the pilot test, it will be distributed to larger groups, and periodical summative evaluation will be conducted after that.

Denny should learn more about constructivist approach to design the course, and to communicate with Dr. Oakes. He can use the existing materials, such as the course video tapes, grant proposals and Dr. Oakes papers to analyze the content. He can interview the previous learners and potential leaners on Dr. Oakes list to analyze leaner. The potential leaners can be candidates for pilot testing. The former students can be candidates for the mentors/guides of the program or online forum. Denny can also video tape their classes to be used as course material.

Based on expectation of Dr. Oakes' science class, different constructivist approaches will be explored in the course with a focus on **Problem-based learning** and **Inquiry-based learning**. To prepared learners with the skills and knowledge before they can design their projects, I will use two scaffolding methods. The first is to use **focused questioning** to let learners explore and learn possible learning methods; the second is to use **contrasting cases** to ask the learners to compare the constructivist method and traditional method, and to compare the difference among different constructivist methods. I got this idea from the "Doing by Understanding" paper.

Since the course needs to suit for flexible time and large audients**, online based learning** will be used. The site will have links to materials like papers and video clip of the demo classes. The site will also feature video clips of classes of different stage of previous students, with which student can see the progress of the learning process and explore the common problems during the learning process.

Online forum will be used to build a learning community to promote peer to peer communication, and to provide feedback. Qualified previous students can act as online mentors. The forum can also be a self-assessment tool; student can revise their learning process based on the feedback.

My Cmap file shows both the design process and the product feature. The key factors of in the System approach is color-coded yellow. Project requirements are linked to specific project features. Available materials are linked to their usage. The file contains a nested note which explains how I am going to use "Project-base" learning approach. Links to web pages of the notes provides further information of constructivist learning approaches.

Reference

http://eduscapes.com/tap/topic43.htm
http://pages.uoregon.edu/moursund/Math/pbl.htm
http://people.cehd.tamu.edu/~rcapraro/PBL/PBL%20Research/Doing%20with%20understanding%20in%20PBL.pdf