Project Year
2012-2013

Project Title
eWorkbook: A Student Tool for Building Rich & Meaningful Connections between Pieces of Knowledge

Project Team
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Audience
The audience for the completed project will be undergraduates enrolled in future terms of (AS.280.350) *The Fundamentals of Epidemiology* in the Krieger School of Arts and Sciences. This course is part of the core curriculum of the Public Health Studies major, the largest undergraduate major at Johns Hopkins.

Pedagogical Issue
This proposal addresses students' knowledge organization and how it affects their learning. Undergraduate students in *The Fundamentals of Epidemiology* are skilled at memorizing isolated definitions, formulas, and steps of a calculation. However, they struggle with grasping the important ways in which these elements interconnect across the course material and other courses taken at Johns Hopkins.

Solution
The pedagogical issue of student knowledge organization in *The Fundamentals of Epidemiology* will be addressed by the "eWorkbook" digital course resource. The eWorkbook will serve as an interactive, self-guided electronic tool for students to build rich and meaningful connections between pieces of knowledge.

Using the eWorkbook, students will be able to (1) expose their individual knowledge organization by concept mapping, (2) practice categorizing course elements and concepts across various organizational schemas, (3) interact with concepts by simulations and demonstrations, and (4) actively collaborate with their classmates on real-time, "living" diagrams of the "big picture," including interrelationships of course elements, concepts taught in other JHU courses, topics from current events, etc. These learning elements are based on pedagogical literature.

Technologies Used
eBook platform, InDesign, iOS and Android tablets and smartphones

Faculty Statement
This proposal addresses the pedagogical issue of students' knowledge organization and how it affects their learning. Knowledge organization with rich and meaningful connections facilitates deep learning, successful application of learning, and building of a robust foundation for subsequent learning (Ambrose et al, 2010). To address this issue, I now explicitly draw connections and ask questions that require students to make the connections themselves.

Specific Aims: (1) Develop and refine the eWorkbook and prepare tools for eWorkbook evaluation during summer and fall semesters 2012 (fellow and faculty); (2) Implement eWorkbook in *Fundamentals of Epidemiology* during spring semester 2013 (fellow and faculty); (3) Conduct assessment of eWorkbook's impact on learning and teaching in the Fundamentals of Epidemiology during spring semester 2013 (fellow and faculty)

The eWorkbook proposal enhances pedagogy because it suggests that students can interactively work on building more meaningful connections between pieces of knowledge with a self-guided tool. This is new way of thinking about the curriculum because it actively helps students grow their minds beyond superficial memorization and sparse connections. It is unique as it assembles several tools that are informed by evidence from a large body of pedagogy literature.

With the eWorkbook, students will have access to a new electronic resource to support course objectives that contains multimedia elements focused on concept mapping, categorization of course content by various schemas, simulations and demonstrations, and collaborative space. For example, the eWorkbook will allow students to collaborate with classmates on real-time, "living" diagrams of "big-picture" concepts. It will improve student access to not only additional electronic information resources, but also to each other.

We will determine if the project has been successful via a robust assessment strategy. Conducting a randomized trial of the eWorkbook intervention will quantify the impact on improving teaching and learning. Since evaluation data are already collected for course administration, it will not pose a burden. Results will be reported to enrolled students as well as to the Schools of the fellow and faculty and to the CER. If necessary, we will submit an application for IRB approval.

Assuming the eWorkbook positively impacts student learning, we anticipate that it could be easily adapted and enhanced for use in any undergraduate course at Johns Hopkins. eWorkbook will be "open source" so any instructor can modify it with concept mapping elements, schema for categorizing course content, simulations and demonstrations.