Improving Critical Thinking – A Guided Problem Based Learning (PBL) Approach using a Reversed Textbook

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Instructional Innovation Grant Proposal for Summer 2013.

I have reviewed the proposal, and I support the request for a course release for the project.

_Pamela S. Barr (electronic signature)___  __March 6, 2013___
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Problem Statement

Enhancing critical thinking ability among students is a key initiative of Georgia State University and RCB. Employers rate critical thinking as one of the top qualities they expect among graduates. Research over the past couple of decades has made it abundantly clear that traditional teaching methods like a straight lecture creates an atmosphere of passive learning and rote memorization. Development of critical thinking is limited under these circumstances. Retention of learning and critical thinking are enhanced by active learning strategies that seek to engage students in and out of the classroom in collaborative efforts (Johnson & Johnson, 1986; Totten, Sills, Digby & Russ, 1991).

Several approaches have been suggested in the literature to help motivate students to think critically, and one such approach is Problem-Based Learning (PBL). This constructivist approach leads to a couple of basic principles. One, anchoring learning to a larger task, and two, helping students take ownership of the learning (Savery & Duffy, 2001). The concept of designing courses and curricula around PBL has been applied in several fields of study including Engineering, Social Sciences, and Business. Norman & Schmidt (1992) reviewed the evidence and found that PBL can result in increased retention of knowledge over a longer period of time, enhances interest in the subject matter, and increases self-directed learning. The increase in problem solving ability is content specific, meaning that there is not enough evidence that the approach increase general problem solving ability in other areas than the one where the approach is used. Kirshner, Sweller & Clark (2006) on the other hand, based on their understanding of human cognitive architecture, argue that methods of instruction like PBL that include minimal guidance from the instructor are bound to be less effective than guided instruction. They recommend worked examples, which they consider to the epitome of guided instruction, to help novices learn effectively.

The above research indicates to us that for teaching a core class where students come with almost no prior knowledge of the subject, a purely unguided PBL approach would probably not work to enhance critical thinking. However, the traditional approach of lecture, followed by worked examples and then assignments does little to motivate the students to study a subject they are not interested in. A combined approach, using elements of PBL to motivate the students, along with sufficient guidance in solving problems is, in our opinion, a more effective approach to teaching. To that end, we developed a reversed textbook (described later in the methods section) for a core undergraduate business analysis class that attempts to encourage students to think critically.

Proposal Objectives

The following are the key objectives of this study:
1. To demonstrate that the Guided PBL approach using the reversed textbook approach does in fact enhance student learning and critical thinking ability.
2. To show that this method can be adopted effectively by faculty in any business discipline.
Methodology
A Guided PBL approach that we propose has two key components: the instructor as facilitator and a reversed textbook. A traditional textbook begins with theory and concepts, followed by exercises or problems. The reversed textbook begins with a general statement of the problem and allows students to explore different aspects of the problem in their own way, and have an exchange of ideas with other students in the classroom. The instructor does not lecture to “cover content”, but facilitates discussion on the issues and provides a business context for the problem. After sufficient discussion and interaction with and among students, the instructor guides them towards finding a satisfactory solution.

Evaluation
For this study, the impact of using the Guided PBL approach will be tested over the summer and fall semesters in 6 sections of MGS 3100 (Business Analysis) taught by 3 different instructors in order to control for variations due to instructors. Specifically, we will test for increase in critical thinking ability in two ways:

1. We will develop and administer pre and post tests that assess problem solving ability at the critical thinking level.
2. A survey will be conducted to measure student perceptions of improvement in their critical thinking ability in this domain.

Data will be collected and analyzed to test for significant improvement in students’ critical thinking abilities, as well as their perceptions regarding their abilities. Pairwise Means tests will be performed to test for significance.

Most all faculty members can adopt the approach presented and tested in this project for their course. At minimum, they can achieve this by creating reversed examples and illustrations to teach with. At a broader level they can create a similar book and teaching approach for their courses.

Funding/Equipment
No special equipment is needed for this study. The only requirement is time, so we ask for a summer course release to conduct the study. Both authors are IRB certified, and appropriate IRB approval will be obtained in order to facilitate collection of data as necessary.

References