Teaching Merchandising Math: Aligning Four Perspectives on Learning Environments

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The framework of aligning four perspectives on learning environments was synthesized by Bransford, Brown and Cocking (1999) based on new understandings of how people learn. The four perspectives are learner-centered, knowledge-centered, assessment-centered and community-centered. Although the framework has gained significant attention from educators across K-12 and post secondary (i.e. Pintrich, 2004), most studies only focused on one of the four perspectives without demonstrating 'a systems approach' that is needed to design an effective learning environment (Bransford, et al., 1999). The purpose of this study was to illustrate such a systematic approach through a merchandising math class.

Learner-centered environments This perspective requires the instructor to make linkage between the students' existing knowledge and new knowledge that students will acquire (Bransford, et al., 1999). For this class, the students' existing knowledge was considered in three aspects: their existing math operation skills, their attitudes or emotion towards math and their merchandising experiences. To address the first aspect, a math pre-test was used for diagnose purpose and subsequent math reviews were provided, including online review modules. To address the 'math phobia' emotion, basic math and understanding were persistently repeated through the semester. As to the third aspect, students were often asked to share their work experiences and merchandising knowledge to new lecture topics. These learner-centered efforts helped students understand new merchandising concepts which could be expressed mathematically.

Knowledge-centered environments The goal of knowledge-centered environments is to help students gain a deep understanding or 'an integrated understanding of a discipline', meaning that students can make connections between objectives or ideas or concepts (Bransford, et al., 1999). In this merchandising math class, the types of lecture information and learning activities were selected and designed to weave all merchandising concepts as a connected network. In another word, teaching merchandising math is not about a set of formulas or calculations; it is a way of thinking and making connections among merchandising concepts. For example, when teaching sales planning by market share concept, students were given information of global consumer expenditure distribution of both developed and developing countries; exercises of market share calculations and discussion questions were constructed with these data. Then, students were given the local and US national demographic data, and prediction exercises were created for student to use the data to estimate local apparel market. As a result, students understood the

concept of market share percentage and its calculation by connecting to global economic development concept and consumer demographic concept, thus a deeper understanding of market share concept was achieved besides knowing the formula of market share percent calculation.

Assessment-centered environments Aligning with the goal of deep understanding, assessment 'must focus on understanding' and assessment task design needs to consider both content (from lean to rich) and process (from constrained to open) (Bransford, et al., 1999). For example, in assessing students' deeper understanding of inventory turn and gross margin return on inventory (GMROI), the task is designed with rich content and open process in mind. Students were given a company's financial statement to find out the company's inventory turn and GMROI and to discuss the results. The content of the financial statement has all other financial data besides those needed for turn and GMROI calculations, and the process is open as to which approach or formula can be used first. The discussion was also an open process with rich content when students drew connection to industry benchmark statistics on turn and GMROI.

Community-centered environments Studies about learning indicate that student learning can be enhanced by a positive social norm in classroom and school settings, and that students should be allowed 'to make mistakes in order to learn' (Bransford, et al., 1999). Inside the classroom of this class, there were frequent in-class exercises and discussion sessions during which students were encouraged to check their works with others and they were not afraid of making mistakes since the works were not part of their grade. Outside the classroom, students were encouraged to work together and there was also a student tutor who provided help to students besides the instructor. To extend the community to a larger context, speakers were invited to present how they use merchandising math at their daily jobs and the importance of data in merchandising decision making process. The overall positive social norm around this class setting, therefore, created a learning community that encouraged learning towards a deep understanding.

Summary The above illustrated a systems approach of aligning the four perspectives on learning environments towards the goal of helping students gain deeper understanding of merchandising math. Since the implementation of this approach, student success rate increased to 96% from 85%, and the mean assessment score increased to 86% from lower than 70%. Student Opinion Survey of Instruction improved significantly from lower than 4.0 to over 6.5 on a 7-point scale. More students were interested in getting a merchandising math related career.

Bransford, J., Brown, A., and Cocking, R. (1999). *How People Learn: Brain, Mind, Experience, and School*. National Academic Press, Washington, DC.

Pintrich, P.R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, *16*(4), 385-406.