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Taking higher order thinking seriously: Using Marzano's taxonomy in the economics classroom

Justin M. Dubas[a,*], Santiago A. Toledo[b]

[a] Department of Economics, Texas Lutheran University, 1000 W. Court St., Seguin, TX 78155, USA
[b] Department of Chemistry, St. Edwards University, 3001 S. Congress Ave, Austin, TX 78704, USA

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ABSTRACT

This paper argues for the need for instructors to more intentionally foster higher order thinking skills in economics students, as these skills lend themselves to longer-lasting, more transferable knowledge. This paper proposes the use of Marzano's taxonomy to aid in this endeavor. It provides a clear functional delineation between lower- and higher-order thinking, and serves as a natural way to systematically build a course around incrementally building up student thinking skills. We outline how it was used in course design for drafting student learning outcomes (SLOs), creating assessments for a Principles of Economics course, and leveraging it as a tool to provide more targeted feedback for students. Preliminary observations on the impact on student learning are presented.

1. Introduction

The goal of economics instructors is ostensibly to help students 'think like an economist' (Siegfried et al., 1991; Colander and McGoldrick, 2009). Despite these efforts, the educational outcomes associated with economics classes and/or the major itself are lacking (McGoldrick and Garnett, 2013; Walstad and Allgood, 1999; Katz and Becker, 1999; Hansen et al., 2002). Perhaps the issue is that, because economics at its core is analytical, instructors assume that students will naturally pick up a sophisticated understanding just by completing a course/major (Borg and Borg, 2001). The poor outcomes have led some to be more intentional in developing student's cognitive abilities. (Thoma, 1993; Ennis, 1985; Mc Daniel and Lawrence, 1990; Greenlaw and DeLoach, 2003; McGoldrick and Garnett, 2013). Indeed, the literature in teaching and learning also underscores the importance of developing such thinking skills (Bransford et al., 2004; Ambrose et al., 2010; Fink, 2013). For deep learning to occur, learning that can result in long-lasting, transferrable knowledge, it is essential to develop higher-order skills that include an understanding of the basic ideas/concepts within the context of a conceptual framework, organized in a fluid structure that can accommodate new information/ideas or concepts (Bransford et al., 2004). Only then can we reasonably expect students to be able to transfer their learning across classes or to new situations (Bransford et al., 2004; Perkins and Salomon, 1992; Biggs, 1999; Prosser and Trigwell, 1999). If we want students to be able to use the tools of

* Corresponding author.
E-mail addresses: jdubas@tlu.edu (J.M. Dubas), stoledoc@stedwards.edu (S.A. Toledo).

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economics as they interpret a novel situation through the lens of an appropriate economic model or predict the impact of a policy proposal, i.e., to think like an economist, we must intentionally facilitate the development of higher-order skills. In an increasingly complex, dynamic world, this skill will become even more important and more highly valued (Hart Research Associates, 2013).

Course design, then, needs to specifically target them. However, it is not reasonable for us to expect that repeated exposure to higher-order tasks is sufficient. There is a robust literature on the positive effects of scaffolding student learning (Ambrose et al., 2010; Simons and Klein, 2007; Cooper et al., 2012; Eddy and Hogan, 2014; Baddeley, 1999; Sweller and Cooper, 1985; Clarke et al., 2005; Vygotsky, 1978). Scaffolding is a way of breaking up a task into smaller chunks to reduce cognitive load, and to provide an appropriate level of challenge-not too easy, not too hard—given a student's prior knowledge. In this respect, we emphasize the nature of scaffolding across information-processing levels, and less it does not preclude the social constructivist scaffolding course design and instruction need to slowly build students up to the desired outcome (in this case, a higher-order level of understanding) to maximize the chances for success.

Finally, feedback must be an important piece of any course design. Students and faculty alike need to be aware of the goals of learning/instruction, and have a way to monitor their progress towards meeting the goals. Feedback may come in the form of grading by the instructor or through self-reflection, but ultimately needs to possess a few key features. It needs to be specific so it is actionable, it needs to be targeted so as to not overwhelm students/faculty with the sheer amount of feedback, and it must be timely enough to allow students/faculty to incorporate the feedback into future practice (Hattie and Timperley, 2007; Nicol and Macfarlane-Dick, 2006; Ambrose et al., 2010).

Our search for a framework for course design that incorporated each of the three elements in a manner that facilitated the development of higher-order thinking skills led us to Marzano's taxonomy (Marzano, 2001; Marzano and Kendall, 2007). First, it offers an operational definition of the distinction between lower- and higher-order thinking skills: lower-order thinking skills involve accessing and making sense of *existing* knowledge while higher-order thinking skills elicit the creation of *new* knowledge (Marzano and Kendall, 2007). Though there may be other conceptions of the idea, we adopt the version put forth by Marzano. Secondly, by presenting a framework that not only distinguishes between the two but approaches the process of building knowledge as a series of hierarchically-arranged cognitive processes, scaffolding is an inherent feature of the taxonomy. And, with a scaffolding structure that is well-defined, it is easier to design assessments, plan instructional activities and generate accurate and precise feedback that emphasizes progress towards higher-order thinking.

A number of other taxonomies have been developed, with Bloom's taxonomy as the most widely used (Fink, 2003; Anderson and Krathwohl, 2001; Bloom, 1956; Orlich et al., 2012, 86). However, not all taxonomies develop learning as a hierarchical process. By definition a taxonomy is simply a tool to classify. However, the hierarchy is a necessary component if proper scaffolding is a goal. We adopted Marzano's version in part because it does not suffer from the issues associated with the taxonomies with a looser (or no) hierarchical structure and provides a parsimonious categorization that increases its potential as a tool for effective feedback. Bloom's has been used as a hierarchy, though it was not intended to serve that role and does so now only imperfectly (Bloom, 1956; Anderson and Krathwohl, 2001; Krathwohl, 2002; Amer, 2006; Kreitzer and Madaus, 1994; Ormell, 1974). Hansen (1986) has proposed a Bloom's-inspired set of proficiencies geared specifically towards

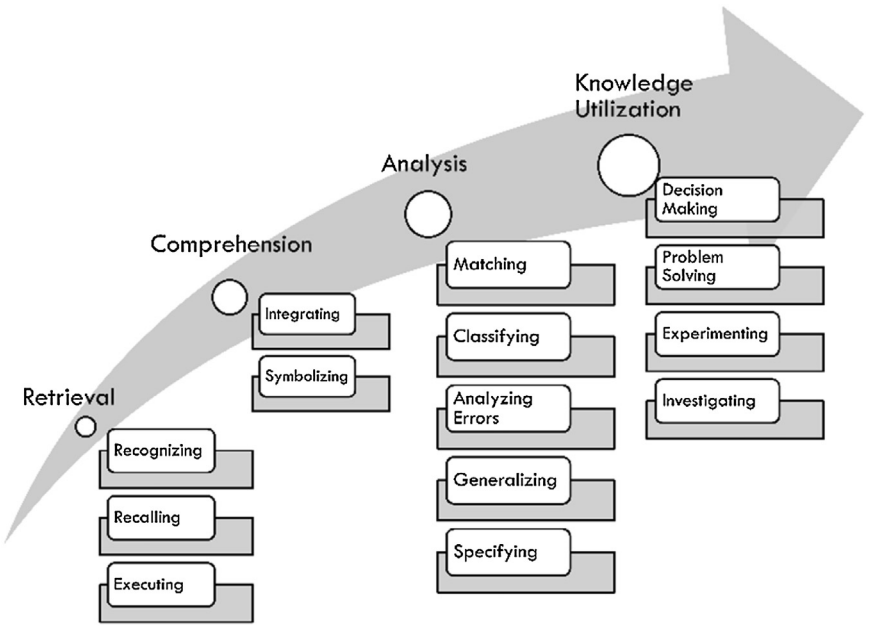

Fig. 1. Visual representation of the cognitive levels in Marzano's taxonomy arranged hierarchically according to level of cognitive control.