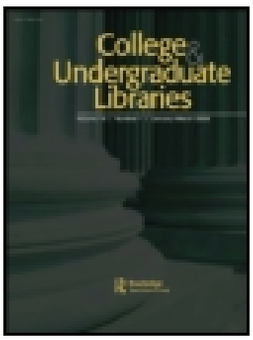

College & Undergraduate Libraries

ISSN: 1069-1316 (Print) 1545-2530 (Online) Journal homepage: http://www.tandfonline.com/loi/wcul20

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To cite this article: Nancy Nentl & Ruth Zietlow (2008) Using Bloom's Taxonomy to Teach Critical Thinking Skills to Business Students, College & Undergraduate Libraries, 15:1-2, 159-172, DOI: 10.1080/10691310802177135

To link to this article: http://dx.doi.org/10.1080/10691310802177135

Using Bloom's Taxonomy to Teach Critical Thinking Skills to Business Students

Nancy Nentl
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ABSTRACT. Using Bloom's Taxonomy, this article provides a practical approach for enhancing critical thinking by business students. The article first describes Bloom's Taxonomy and how the model may be used as a framework for engaging business students in higher-order thought. It then explains how secondary research methods can be used to move business students to the higher planes of thought identified in Bloom's Taxonomy. Lastly, Herrick's criteria are used as a framework to analyze and evaluate the quality of secondary sources.

KEYWORDS. Bloom's Taxonomy, critical thinking, secondary research, information literacy, library research, Herrick

INTRODUCTION

Critical thinking skills are vitally important for business students as they prepare for strategic analysis and decision making in organizational settings. While the need for infusing sophisticated analysis and thought

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College & Undergraduate Libraries, Vol. 15(1–2), 2008
Available online at http://cul.haworthpress.com

doi: 10.1080/10691310802177135

into a business curriculum is clear (Roy and Macchiette 2005), engaging students in critical thinking can be complex and challenging. Furthermore, determining evidence that critical thinking has actually occurred is problematic. This article suggests that Bloom's Taxonomy of Educational Objectives, a classic learning objective and evaluation model in the U.S. since its publication in 1956, is an important framework both for developing course assignments and for serving as a yardstick against which to measure evidence that critical thinking has occurred.

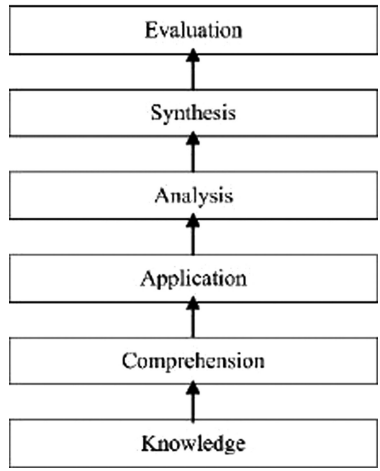
BLOOM'S TAXONOMY

Benjamin Bloom's Taxonomy of Educational Objectives, herein referred to as Bloom's Taxonomy, was developed at the University of Chicago by a group of cognitive psychologists and spearheaded by educational psychologist, Benjamin Bloom (Bloom 1956). Bloom's original purpose for enlisting this group of measurement specialists from across the United States was to reduce the labor of preparing annual comprehensive examinations and to bring about some standardization of learning objectives in academia (Krathwohl 2002). The group's intent to identify and standardize learning objectives for student achievement led to the collaboration of banks of test items, each measuring the same educational objective.

Bloom's Taxonomy rose to significant prominence in the 1960s with the increased emphasis on education during the period of Lyndon Baines Johnson's Great Society, and today the model is well known to many educators. Although Bloom's taxonomical theory addresses three domains of learning (the cognitive, psychomotor, and affective), the primary interest of this article is the cognitive domain with its six successive stages of learning: the lower-order learning of knowledge, comprehension, and application; and the higher-order learning of analysis, synthesis, and evaluation.

The appeal of Bloom's learning model is its elegance, simplicity, and versatility. Its elegance and simplicity emanate from the notion that learning presumes to occur in this linear and hierarchical fashion. That is, relatively simplistic learning such as concrete knowledge, comprehension, and application must necessarily occur before learners can engage in more sophisticated and creative learning such as analysis, synthesis, and evaluation (see Figure 1). The versatility of the model is seen in its application for all levels of education, from kindergarten through higher education, as well as its cross-disciplinary use in business, the social sciences, and other applied sciences (Athanassiou, Mcnett, and Harvey 2003; Bissell and Lemons 2006; Blazelton 2000; Buxkemper and Hartfiel 2003; Granello 2001).

FIGURE 1. Bloom's Taxonomy



While learning is arguably linear and hierarchical, it is also iterative and dynamic, particularly in the higher learning stages as critical thinking is engaged (Zohar and Dori 2003). In other words, the cognitive action of analyzing new information, synthesizing new information with other information, and then evaluating the parts of the whole and creating new knowledge is ongoing and interrelated, rather than strictly hierarchical, as presented in Figure 2.

APPLYING THE TAXONOMY

To operationalize these learning stages and objectives in a business course, we first look to Moore, Winograd, and Lange (2001) who provide a representative lexicon of definitions and related action verbs that characterize each successive stage. We also add how successful achievement of each stage might be demonstrated and provide specific examples of business course activities.

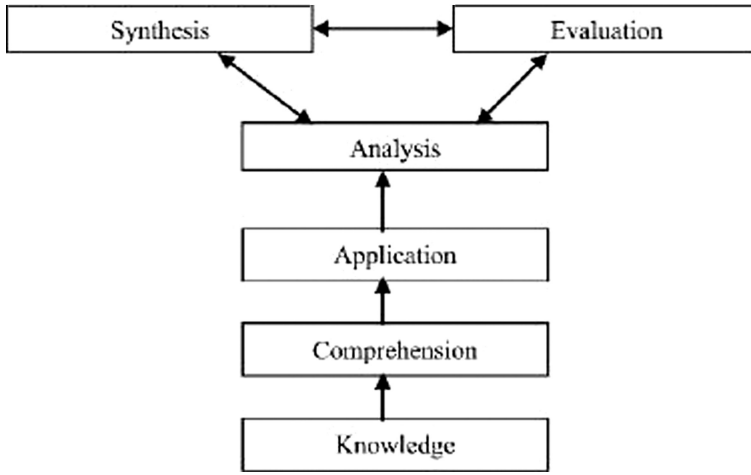
Knowledge:

Definition: To define, memorize, and remember previously learned material such as common terms, specific facts, and basic concepts.

Related verbs: List, describe, identify, show, label, and quote.

Demonstration of achievement: A student can define and recall terms, dates, events, and places or describe subject matter.

FIGURE 2. Interrelated Stages of Bloom's Taxonomy



Examples of course activities: Define the GDP (gross domestic product); list the four Ps of marketing (product, price, place, promotion); identify the purpose of a balance sheet and label its components.

Comprehension:

Definition: The ability to grasp conceptual meaning.

Related verbs: Understand, discuss, estimate, compare, contrast, rank, recognize, and report, or explain facts and principles.

Demonstration of achievement: A student can correctly explain the history of an event, report on the status of an organization, or differentiate phenomena.

Examples of course activities: Summarize the most important social factors that led to the formation of the Securities and Exchange Commission; rank in order of risk the various investment vehicles such as mutual funds, treasury bonds, and individual stocks; compare and contrast qualitative research methods versus quantitative research methods.

Application:

Definition: The ability to use learned material in new and concrete situations or to demonstrate the accurate use of a concept or theory in a different context.

Related verbs: Apply, relate, demonstrate, illustrate, interpret, solve.

Demonstration of achievement: A student can apply a theory in a practical context or recognize and then use the correct methods to solve problems.

Examples of course activities: Calculate a break-even point for manufacturing a new product; utilize Porter's Five Forces (supplier power, barriers to entry, buyer power, threat of substitutes, exit) as a framework for understanding the challenges of starting a new business.

Analysis:

Definition: The ability to break down a complex problem into different parts and to determine the relationships between those parts.

Related verbs: Analyze, appraise, criticize, differentiate, discriminate, distinguish, examine, experiment.

Demonstration of achievement: A student can explain why a particular solution process works to resolve a problem. A student is able to see patterns underlying content or deconstruct the critical components of a framework.

Examples of course activities: Discuss what customer lifetime value is and why it is a potent measure of profitability. Design a segmentation strategy for the U.S. Hispanic market. Write a paper on how the current tax structure in the U.S. impacts taxpayers at various income levels. Analyze the implications of corporate authorship when used as a secondary source.

Synthesis:

Definition: The ability to put parts together to form a new whole.

Related verbs: Arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize.

Demonstration of achievement: A student can rearrange, reconstruct, or combine parts of a process to form and utilize a new whole.

Examples of course activities: Write a five-year plan for an IT department at a state university whose budget is constrained by the legislature. Design a prototype of a new consumer product and conduct a beta test. Formulate a problem statement that reflects a variety of industry data from different secondary sources.

Evaluation:

Definition: The ability to judge the value of material for a given purpose based on a definite set of criteria.

Related verbs: Persuade, appraise, judge, recommend, conclude.

Demonstration of achievement: A student can create a variety of ways to solve the problem and then, based on established criteria, select the solution method best suited for the problem. A student is able to judge an argument's veracity or evaluate another person's work.

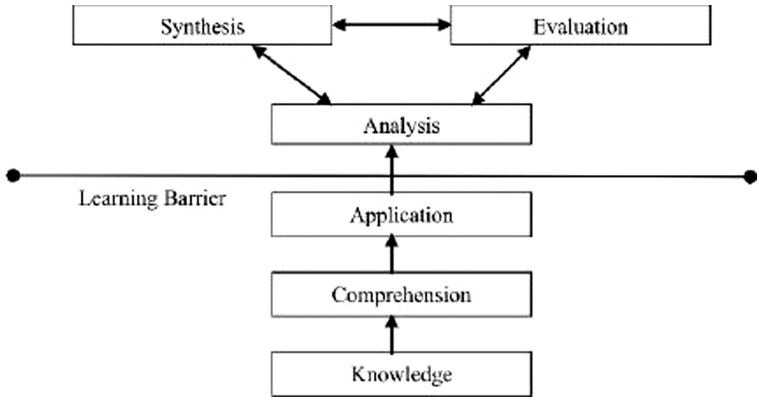
Examples of course activities: Evaluate another student's stock portfolios in a global industry. Assess the market value and profitability of a technological innovation. Write a case where ethical violations have occurred between two businesses and persuade the stakeholders to maintain the relationships in spite of the breach.

Developing course activities and deliverables that reflect the lower learning stages of Bloom's is relatively easy to accomplish for most instructors. In many curricula, in fact, there are courses whose primary learning objectives are acquiring the knowledge and comprehension of business fundamentals necessary for successive courses. For example, a typical accounting course is called Financial Accounting, in which the focus is largely on learning and recognizing relevant accounting vocabulary. This is also found in many other principles courses that familiarize students with business terms and the application of those terms. For example, a description of a typical Principles of Marketing course from the Carlson School of Management, University of Minnesota, reads: "Introduction to terms, concepts, and skills for analyzing marketing problems and factors outside the organization affecting its product, pricing, promotion, and distribution decisions" (University of Minnesota Curtis L. Carlson School of Management 2007). These types of courses are essential and important because they provide the necessary foundation for students to advance to more substantive business courses. However, even more advanced courses inadvertently may have what amounts to lower-order learning requisites, placing few demands on the students to dissect, add to, and evaluate existing knowledge structures. Failing to engage analytical thinking beyond knowing, understanding, and applying a concept presents a barrier to the learning process (see Figure 3).

BREAKING THROUGH THE LEARNING BARRIER

A dilemma many instructors face is how to move students from the foundational stages of learning into more dynamic interrelationship learning. Many types of course activities such as publisher test banks and end-of-chapter exercises, etc., that are commonly used as course activities

FIGURE 3. The Learing Barrier and Bloom's Taxonomy



and evaluation, have a limited ability to compel business students to break through the learning barrier and engage in greater analytical thinking (Simkin and Kuechler 2005; Davidson and Baldwin 2005). The possible exception to this is the integration of simulations into the course curriculum. The use of simulations can be effective since quality simulations have the potential to move students through increasing complexity, motivating students to assimilate, build on, and evaluate "chunks" of prior, stored information (Miller and Nentl 2002).

Another effective way to break through this learning barrier and advance analytical thinking is to teach students how to do quality secondary research, which is becoming increasingly important in professional life (Fallows 2005). Integrating serious secondary research methods into the course curriculum can teach students how to analyze rather than simply replicate information, how to combine that information with other information to create a new understanding, and how to evaluate that new understanding for its veracity and authenticity.

SECONDARY RESEARCH

The sheer volume of secondary research available to students today is vast when the massive amount of information found on the Internet is combined with the extensive resources that reside in physical and electronic libraries. Yet, studies have consistently shown that when asked to investigate an issue or an organization, students rely almost exclusively on

an organization's Website or search engines like Google and Yahoo (Van Soyoc and Cason 2006; Rainie 2005; Jones 2002). Moreover, this is often where the investigatory process stops (Fallows). Students can recognize concepts and even demonstrate applications of concepts of data using such limited sources, but almost certainly this capture of information is insufficient to compare, consolidate, validate, verify, and evaluate. Furthermore, students are at a loss when asked to critique, defend, or integrate their various sources. While this "grab it and go" style of research is often deemed acceptable by students and instructors alike, the reliance on this shallow research activity hampers students' ability to analyze, synthesize, and evaluate the quality of the information they cite. Critical thinking is inhibited, context is often lost, and reliability and validation of sources are tenuous.

Therefore, how does one teach students how to gather, analyze, and validate secondary research? First, students must learn that their school's library has a wealth of information that is available to them beyond Google and Yahoo, and typically at no additional direct cost other than that built into the student fees. Students are often surprised to learn that there is an information market and that accessing and using secondary reports and articles have both direct and indirect costs. Then, students must learn how to find and pinpoint relevant information, analyze and consolidate their sources, and how to judge source veracity and authenticity. One excellent approach for teaching these skills, and one that serves as a catalyst for breaking through the learning barrier and compelling higher-order thinking, is that of Communications Professor, James Herrick, and his discourse on building and critiquing arguments.

HERRICK'S FIVE CRITERIA

Herrick (2004) describes five criteria that should be used to evaluate the evidential validity of information supporting a logical argument: accessibility, consistency, relevancy, recency, and adequacy. These criteria can also be used by business students as they seek to validate information gathered from their secondary resources.

Accessibility

Much of the media coverage and the business success of Google, Yahoo, and other search engines have raised our expectations about information

accessibility. The unasked question, however, is accessibility to what information? Many Websites represent an organization's promotions or opinion threads masquerading as valid evidence and facts. Because of the seduction of the convenience and abundance of this type of information, it often doesn't occur to students and sometimes even instructors to ask questions about institutional and authorial objectives. Moreover, this so-called evidence often forms the sum and substance of an entire student paper or project. When students extract data from an organization's Website, it has been our experience that they often are confused and frustrated about who is ultimately responsible for the content they are citing, and how to properly cite that content.

Consistency

For evidence to be valid, it must be consistent, both internally and externally. To be internally consistent, evidence must not contradict itself; to be externally consistent, there needs to be a consensus around its validity from outside sources. Students often find contradicting facts from different sources, and one indicator of whether a student is critically engaged is when the student questions which one of the competing facts is the correct one. An interesting approach to the problem of establishing external consistency is the idea of triangulation (Brown and Duguid 2000), finding at least three different and unrelated entities that confirm the facts or analysis. Requiring students to establish the validity of the evidence they gather is more work for both the student and the instructor, but it is important work. This substantiation process enables students to engage in breaking apart arguments and constructing and rebuilding new conceptual frameworks, the very definition of Bloom's stages of analysis and synthesis.

Relevancy

Relevancy questions whether the evidence has any bearing on the argument's claim. While this seems to be intuitive, it is often surprising to us that students frequently cite information that is unrelated to their topical area. Examples of problems with business students include using a cost/benefit analysis of a training program in a very labor-intensive industry to argue for a training program in a less labor-intensive industry. Another is using a current newspaper article from one state to argue that real estate values are on the rise in another state. Questioning students about the relevance of their citations and source selections forces students to defend their choices and thus evaluate their own research.

Recency

Like relevancy, the dimension of time has a compelling effect on information quality and use. Knowing the date of document creation is helpful in judging the current usefulness of an article. For example, articles on innovation written in the 1990s obviously have little value and importance compared to articles published in the last six months unless the student is conducting historical research. A "grab it and go" mentality may overlook or marginalize publication dates. However, chronology can significantly affect the context and meaning of those sources dealing with technological advances as well as in areas such as accounting regulations, tax law, supply chain management logistics, marketing, etc.

Adequacy

This criterion asks if the amount of evidence is sufficient to support the claim for which it is used. Adequacy determines if enough research has been gathered to support the argument. "Grab it and go research" activity, of course, would rarely meet this criterion for any substantive topic. Often a student's bibliography can serve as an indicator of adequacy and thus deserves close attention. If the bibliography is comprised of a particular organization's Website, blogs, and Wikipedia, there is not only questionable authenticity, but it is also apparent that the research activity has been superficial and the information gathering inadequate.

Clearly, none of Herrick's criteria can be effective in isolation. That is, research can be relevant but not recent and accessible but not consistent. Thus, an instructor should require good quality information that satisfies all five criteria. The best way to assure this level of quality is for students (and instructors) to first learn how to use their library, and, in particular, their online library. Many faculty and students are surprised by the convenience, the quality, and the volume of proprietary, vetted, third-party information available for no direct cost to the students. For example, if a student wants to know how to analyze an industry, its trends, its financials, and key ratios and statistics, a library subscription database such as S&P NetAdvantage readily supplies that information. Or, if a student is required to understand a company's history and watershed events over the last decades in addition to its financials, a database such as the InfoTrac Business and Company Resource Center can provide detailed information that is not readily available or as well-organized through popular search engines. The ValueLine database provides investment analysis of over 1,700 companies, including

stock price data and performance, business description, and detailed operating information that is helpful in portfolio management. Many online libraries also carry numerous article databases such as Lexis Nexis and ProQuest that allow users to tap into the world's publications. These and many other important databases contained in online libraries allow for seamless triangulation that facilitates the gathering of secondary sources and satisfy Herrick's criteria for evidential validation.

EXAMPLE OF AN ASSIGNMENT REQUIRING SECONDARY RESEARCH

The following is an actual assignment that has been effective in using secondary research methods as a tool to advance students to more complex stages of learning. The assignment is required for a course, Practical Research Methods for Managers, which is a two-credit gateway course for incoming MBA students at Metropolitan State University.

Mgmt 600 Assignment 1

This assignment represents the first component of your final research proposal and requires you to use secondary data sources to learn about the organization and the marketplace. You must first think of an organization that is of interest to you and one that is facing some type of researchable issue. For example, *XYZ Computers* has lost significant revenue over the last two years and management wants to know why. Management suspects that customers are no longer satisfied with their product offerings since the company has been plagued by customer service issues. They also suspect there are industry changes going on that affect their business.

You should include a background discussion of the organization, including a brief history, the market it serves, plus some important recent/relevant events or accomplishments. You should also discuss the organization's leadership, its mission, its resources, its size, etc. Then you should provide an analysis of important characteristics of the market or industry, the firm, and its competition. When discussing the industry or market, you should describe the product or services (retail gasoline, gaming, printing services, etc.), the number of firms in the industry, how easy or difficult it might be for new firms to enter the industry, where the firms are located, and how firms compete with each other. Please provide a thorough analysis of the organization's main competitors in the sector, its resources relative to competitors, and how it is differentiated from other firms.

Gathering this information from a variety of reliable resources, you will then be able to identify the organization's primary and most relevant strengths, weaknesses, opportunities, and threats, the so-called SWOT analysis. For example, referring to our example of *XYZ Computers,* some of the points in a SWOT analysis may be high expertise on its board of directors (strength), managerial marketplace myopia (weakness), nano technology advancements in the marketplace (an opportunity for XYZ since one of its board members is a leading nano scientist), major competitors who are quick to respond to technology advancements in the marketplace (threat).

In order to demonstrate a sufficient exploration of your topic, you must cite at least six different sources from three proprietary library databases. Please use APA format. You are not allowed to use Wikipedia or blogs. Information gathered from an organization's Website will count for only one of the six sources. Furthermore, in order to earn full credit, your sources should be relevant, timely, and logically consistent. If you find two views that significantly disagree with each other, please find other verifiable sources that support one of the views. These additional sources should be independent from either of the conflicting views.

You will be graded on your accurate application of secondary research and your ability to analyze your information for its veracity and significance for your topic. You will also be judged on your ability to synthesize the information into a logical and comprehensive picture of your organization's current situation.

A comprehensive situation analysis should reveal a variety of issues that are potential areas for primary research inquiry. Therefore, the accurate evaluation of all your information is expected to lead to a logical, researchable question that will form the foundation of your final proposal.

CONCLUSION

As Fornaciari and Loffredo Roca (1999, 735) stated: "Internet research needs to become, in Langer's terms, a 'mindful endeavor.' More than how to use search engines, how to narrow searches, and how to locate masses of information, we need to teach our students about "mindfulness."

Bloom's Taxonomy is the ideal framework for teaching "mindfulness" using secondary research methods. Our experience as co-instructors of the Mgmt 600 gateway course using this framework is that students move beyond Google and learn to refine their secondary research skills. They gain a greater appreciation for valid and reliable information and demonstrate a fresh interest in the quality resources that are readily available through

the online library. Moreover, they become less enchanted with ubiquitous Internet searches and more reliant on and fascinated with proprietary data. Students begin to recognize the strengths and weaknesses of their own sources, as well as to evaluate those of others. They better understand the value and purpose of quality information and its integration into business content. Most importantly, they begin to think more critically and move beyond the learning barrier. We are encouraged that instructors who have our students in succeeding courses frequently remark that the Mgmt 600 students exhibit substantial research and analysis skills and sophistication of thought in their written work. Our successes have, in fact, led to recent faculty discussions about integrating these teaching approaches across the business curricula.

In spite of, or perhaps because of, the volume of information that students have at their fingertips, many are cavalier about the research and analysis processes. However, when students are challenged to move to the higher planes of thinking as described in Bloom's Taxonomy, analytical sophistication grows quickly. As business students transcend the learning barrier, they are well on their way to becoming strategic decision makers and mindful thinkers.

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Received: 07/10/07
Revised/Reviewed: 10/31/07
Accepted: 11/01/07