

JOURNAL OF THE ACADEMY OF BUSINESS EDUCATION

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STUART MICHELSON, Editor
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Linda Kuechler at Daemen College, our VP Finance and longstanding ABE member recently passed away. Linda was a valued and dedicated advocate for our organization. Linda will be truly missed by all. We send our thoughts and sympathies to Linda's friends and family.

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Learning Styles of Business Students: Twenty-Five Years in Review

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Learning styles are of interest to business educators who want to maximize the results of their efforts in the classroom and meet the learning needs of their students. Numerous studies have been published in journals of business education, educational psychology, and other education-related journals. One shortcoming is that the existing literature on learning styles, as focused on students in business courses, has not been comprehensively reviewed. A goal of this paper is to provide to faculty who are not familiar with the field an overview of the models. A second purpose is to synthesize relevant learning style research involving business students, providing faculty a sense of the key findings and limitations. This examination does not support emphasis of one particular model or style.

Keywords: Business Students, Learning Style Models, Pedagogy

Disciplines of Interest: Accounting, Economics, Finance, Management, Management Information Systems, Marketing

INTRODUCTION

As business educators, we are concerned with our students' learning process. We want to facilitate their learning to help ensure their future success in the business world. As Jaju, Kwak, and Zinkhan [2002: 49] noted, business is a field that has "considerable variation in inquiry, norms, and knowledge structures." It is multidisciplinary in nature and requires both quantitative and qualitative skills. Additionally, business faculty seek activities that will help in linking theory to the business world, increasing the complexity of the discipline [Garber, Hyatt, Boya, and Ausherman, 2012]. As engaged business educators, we seek better teaching and learning methods to accomplish these complex tasks. Learning style models have been a topic of research interest not only in educational psychology, but also

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in business education, engineering education, and other areas. However, the results are mixed.

AN OVERVIEW OF LEARNING STYLE MODELS

A learning style is defined as “the preferences students have for thinking, relating to others, and particular types of classroom environments and experiences” [Grasha, 1990: 26]. The predominant models are outlined in Table 1, and a brief discussion of the models is presented here.

The seminal work in the learning styles literature was done by Kolb [1976, 1984]. He posited that students have preferences for doing vs. reflecting and for experiencing vs. thinking. Learning occurs in a cycle, with successful learners moving through four phases: abstract conceptualization, active experimentation, concrete experience, and reflective observation. Kolb implies that learning preferences are not fixed traits but instead change over time with age and experience. Instructors applying Kolb’s model recognize a cycle of learning and build courses that allow students to engage in exercises, observations, theories, and applications.

Gregorc [1982] also made key contributions to the educational psychology literature, emphasizing that information processing varies from concrete to abstract and from sequential to random. Honey and Mumford [1993] built on Kolb’s work to develop a learning styles questionnaire (LSQ) targeted for management trainees. The LSQ measures whether an individual is most likely an activist, reflector, theorist, or pragmatist. The Felder-Silverman model [1988] has components for information intake and for cognitive processing. Students may use an online questionnaire to assess whether they are verbal-visual, sequential-global, active-reflective, or sensing-intuitive learners [Felder and Solomon, n.d.].

Sensory modality addresses the question of how students prefer to take in information. The VARK model focuses on four modalities: Visual or graphic (V), Auditory (A), Reading/writing (R), and Kinesthetic (K) [Fleming and Mills, 1992; Fleming, 2001]. The Visual preference includes forms of symbols, diagrams, charts, maps, etc. that people use to represent ideas rather than using words. The Auditory (or Aural) modality describes a preference for information that is spoken or heard. People who exhibit the Reading/writing modality prefer information displayed as words. The modality where preference is given to the use of experience and practice is Kinesthetic. Note that kinesthetic learning does not equate to physical exertion. Hands-on learning may include internships, simulations, and case studies; all of these are familiar to business faculty.

The Myers-Briggs Types and the Keirsey Temperaments are sometimes included in research on student learning styles. Both measures are based on Jung’s theory of psychological type [Keirsey and Bates, 1978; Myers, McCaulley, Quenk, and Hammer, 1998]. Some learning style researchers exclude personality types, even though they fit within Grasha’s [1990] definition of

Table 1. Predominant Theoretical Models Used in Learning Styles Research

Assessment Method	Framework of Model
Index of Learning Styles (ILS)	Developed by Felder and Silverman, with a questionnaire later developed by Felder and Soloman. Four dimensions: active vs. reflective, sensing vs. intuitive, visual vs. verbal, and sequential vs. global. For a questionnaire, see https://www.webtools.ncsu.edu/learningstyles/ .
Keirsey Temperament Sorter (KTS)	Developed by Keirsey and Bates and constructed on Jung's theory of psychological type. Four temperament groups: Artisan (P), Guardian (J), Rational (T), and Idealist (F). For a questionnaire, see https://www.keirsey.com/sorter/register.aspx .
Learning Combination Inventory (LCI)	Developed by Johnston and Dainton. Four dimensions: sequential, precise, technical, and confluent, resulting in a combination profile of the four dimensions. For more information, see http://www.letmelearn.org/about-let-me-learn/learning-connections-inventory/ .
Learning Style Inventory (LSI)	Developed by Kolb. Two dimensions (active experimentation vs. reflective observation; concrete experience vs. abstract conceptualization) resulting in four types: converger, diverger, assimilator, and accommodator. For more information, see https://learningfromexperience.com/about/ .
Learning Styles Questionnaire	Developed by Honey and Mumford. Four types: activist, theorist, pragmatist, and reflector. For more information, see http://www.peterhoney.org/ .
Myers-Briggs Type Indicator (MBTI)	Developed by Briggs and Briggs Myers, constructed on Jung's theory of psychological type. Sixteen types based on four dichotomies: Extraversion (E)/Introversion (I), Sensing(S)/Intuition (N), Thinking (T)/Feeling (F), and Judging (J)/Perceiving (P). For more information, see http://www.myersbriggs.org/my-mbti-personality-type/ .
Student Learning Style Scales (GRSLSS)	Developed by Grasha and Reichmann. Six types: independent, dependent, competitive, collaborative, avoidant, and participant. For a sample, see http://longleaf.net/learningstyle.html .
VARK	Developed by Fleming. Four modes: Visual/Graphic (V), Auditory (A), Reading/Writing (R), and Kinesthetic (K). For a questionnaire, see http://vark-learn.com/the-vark-questionnaire/the-vark-questionnaire-for-younger-people/ .

Source: Adapted from Nicholson et al. [2007].

learning styles. The Myers-Briggs Type Indicator measures 16 types based on four dichotomies: Extraversion (E)/Introversion (I), Sensing (S)/Intuition (N), Thinking (T)/Feeling (F), and Judging (J)/Perceiving (P). The Keirsey Temperament Sorter determines four temperaments: Artisan (P), Guardian (J), Rational (N), and Idealist (F). Although both models are Jungian-based, there is disagreement in the literature as to whether they measure the same or different constructs [Tucker and Gillespie, 1993; Weber, Lee, and Dennison, 2015]. Throughout this paper, we report them as separate models in order to maintain accuracy, but recognize that the models are related and others may choose to combine them. Indeed, some studies convolute the two models by discussing Myers-Briggs as the foundation of the study and using the Keirsey Temperament Sorter as the measure [Johnston, Andersen, Davidge-Pitts, and Ostensen-Saunders, 2009].

The purpose of this section was to provide the reader with a brief introduction to differing learning styles. Comprehensive reviews of learning styles are provided by several authors [Cassidy, 2004; Coffield, Moseley, Hall, and Ecclestone, 2004; Hawk and Shah, 2007] and those comprehensive reviews should be consulted for in-depth discussions of the various learning style models. In addition to recognizing that multiple learning style models exist, it should be noted that the presence of these different methods has added complexity to the work of comparing studies.

CRITIQUES OF LEARNING STYLE RESEARCH

There have been many critiques of learning style research. One criticism of the learning style research is that studies rely on comparing student responses to the pedagogy chosen for the course as a whole [Willingham, Hughes, and Dobolyi, 2015; Pashler, McDaniel, Rohrer, and Bjork, 2008]. Ideally, researchers would conduct a controlled experiment in which some students are provided individually tailored pedagogy, while others receive a randomly selected style of pedagogy. Even if this type of controlled experiment showed gains to the student, the logistical hurdles of assessing and implementing personalized pedagogy are significant, and it would take large benefits to make this worthwhile [Rohrer and Pashler, 2012].

Curry [1990] also criticized learning style research for lack of definition, lack of reliability and validity studies of measurements, and lack of identification of relevant characteristics in instructional settings. Although there have been some reliability and validity studies about learning style measurements since 1990, when Curry wrote about these research deficiencies (for example, see Leite, Svinicki, and Shi [2010(+)] for their work on the reliability and validity of the VARK instrument), the lack of a clear definition persists.

LEARNING STYLES OF STUDENTS IN BUSINESS COURSES

The myriad studies conducted on learning styles raise the question of which approach best fits students in business courses. To determine if there is a research consensus, we summarized major research over the past 25 years. Table 2 presents the authors, date, sample information and size, the method, and a brief summary of the findings for each article. The parameters for an article to be reviewed are as follows: (i) the article must be accessible through a major library database (i.e. Business Source Complete or Academic One File), (ii) the article must have been published within the last 25 years, (iii) the article must be final work published in a journal, not a dissertation, working paper, or conference paper, (iv) the article must be published in English, (v) the title of the article must clearly reflect that learning styles was the topic, (vi) the article must be empirical in nature, (vii) a recognized learning style instrument must be used, and (viii) the students in the sample must be undergraduate business students enrolled in a four-year institution. The bias was to be inclusive rather than exclusive when measuring the article against the criteria.

Fifty-three original articles and one meta-analysis [Loo, 2002a] met those criteria. Of the original articles, 30 percent used Kolb as the theoretical framework, followed by Myers-Briggs (19 percent), Felder-Silverman (16 percent), Keirsey Temperament (13 percent), and VARK (11 percent). Other frameworks used include the Grasha-Riechmann Learning Styles Questionnaire, Big Five Model of Personality, Left Brain/Right Brain, Canfield's Learning Styles Inventory, Honey and Mumford's Learning Style Test, Learning Combination Inventory, Interactive Learning Model, and Dunn and Dunn Productivity Environmental Survey.

Reviewing the articles listed in Table 2, we note a wide array of sample sizes, ranging from 49 [Holley and Jenkins, 1993] to 1,182 [Sandman, 2014]. The majority of the classes surveyed were accounting and economics classes, at 27 percent and 37 percent respectively. The next largest categories were business students at large (21 percent), followed by management information systems (MIS) (10 percent), marketing (8 percent), and management students (4 percent). A note of caution should accompany these percentages. In some studies, it was difficult to ascertain information about the sample. For example, if the sample was students in an introductory accounting course, one might assume the course is open to all business majors, but it was not always clearly noted by the researchers. At some universities, economics courses are part of the social sciences and may attract a broader audience.

Accounting Students

The interest in accounting may stem from an older study by Baker, Simon, and Bazeli [1986], which administered Kolb's Learning Style Inventory (LSI) to senior accounting majors and is cited by many of the subsequent authors [Alder,

Table 2. Literature Review

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Alder, Whiting, and Wynn-Williams [2004]	Kolb	78 students in an intermediate accounting course	Administered Kolb's LSI and looked at case presentation style	The converger learning style was not as prevalent among accounting students as other literature described. There were low numbers of accommodators and divergers
Auyeung and Sands [1996]	Kolb	632 accounting majors at three international universities	Administered Kolb's LSI	Accounting students in Hong Kong and Taiwan were more abstract and reflective and less concrete and active. Australian accounting students were more concrete and active and less abstract and reflective. Students from Hong Kong and Taiwan were assimilators and Australian students were accommodators
Bernardes and Hanna [2009]	VARK	208 students in an operations management course	Examined VARK responses, gender, and major	A total of 36% of students were unimodal, with kinesthetic being the most common and visual the least common. There was no difference in the distribution of styles by major. There was no significant difference in the percentage of males and females who had a unimodal learning style
Bisping and Patron [2008]	Myers-Briggs	26 students in introduction to business	Examined MBTI, college GPA, transfer hours, age, hours currently enrolled, cumulative enrollment, race, gender, and performance in course	Personality type is a significant factor in determining student success. S students are at a disadvantage compared to N students. NTs performed significantly better than other students
Boatman, Courtney, and Lee [2008]	VARK	211 students in introduction to economics	Examined VARK results compared to final grades and TUCE scores	Strong preference for visual learning style positively influenced student performance in an introductory economics class
Booth and Winzar [1993]	Myers-Briggs	122 accounting majors at three Australian universities	Administered Form G of the MBTI	Accounting students showed preferences for Sensing, Thinking and Judgment
Borg and Shapiro [1996]	Myers-Briggs	119 students and 3 professors in principles of macroeconomics	Administered MBTI and used course grades	ISTJ students did significantly better in class than ENTP, ESTP, and ENFP students. Introverts performed better than extraverts. Students with SJ temperaments performed very well, and NT and NF student performed significantly worse than SJ students. Students whose temperament type matched those of the professors did significantly better than if there was a mismatch
Borg and Stranahan [2002]	Keirsey Temperament	Upper-level economics students (intermediate macroeconomics, labor economics, or public finance) (166)	Used Keirsey-Temperament Sorter with course grade, GPA, transfer data, age, sex and race, teacher, and course as variables	Introverted students make better grades in upper-level economics course. Students with SJ temperaments make significantly better grades in upper-level economics courses than identical students with SP temperaments

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Brock, Thomsen, and Kohl [1992]	Kolb	142 students in introductory MIS course	Measured computer literacy and Kolb's LSI	Slight differences in learning styles were found between males and females. Slight performance differences were found between AC-CE and AE-RO groups, with the AE-RO groups having higher performances
Brooks and Khandker [2013]	Left brain/right brain measure	327 students and 5 faculty members in principles of microeconomics	Examined students' hemispheric preference scores, faculty hemispheric preference scores, and the difference between the two	Hemispheric preference is not a statistically significant predictor of the students' final course grade
Brunton [2015]	Kolb	419 students from nine introductory microeconomics classes	Administered Kolb's LSI and collected performance data-total points, posttest scores, and difference in pretest and posttest scores	Student learning style had no significant effect on performance
Clark and Latshaw [2012]	Felder-Silverman	77 students in introductory accounting class	Variables were math and verbal SAT scores, learning styles (measured by the Index of Learning Styles Questionnaire) learning/teaching style interaction, attendance, homework grade, and gender; student performance was the final course grade minus the homework grade	Teaching/learning style interaction was not significant. Reflective and sensing learning styles were important in determining student performance
Char and Collier [2015]	Not clearly defined. Used VAK (did not include R)	Less than 64 students in four microeconomics classes, two talk-and-chalk/two flipped classrooms (the exact number of students was not given—only mentioned fewer than 16 students in each class)	Compared results between the traditional talk-and-chalk and the flipped classrooms	A study of <i>post hoc</i> data of student outcomes of microeconomics courses that used classroom flipping showed student appreciation of teacher efforts, but no significant improvement in results
Chowdhury and Amin [2006]	Big-Five Model of Personality	105 students in introductory economics class	Administered questionnaire derived from the Five-Factor Modality (FFM) and used student grade in the course	Conscientiousness, agreeableness, and interaction of agreeableness and conscientiousness were all significantly related to students' performance in the course
Devaraj and Raman [2014]	VARK	112 principles of economics students	Administered the VARK survey, collected race and gender information, and measured learning performance by testing students on learning outcomes from a single experiment	No significant relationship between learning style and performance results from the experiment. Most students had unimodal styles

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Eide, Geiger, and Schwartz [2001]	Canfield	531 accounting majors in four different schools and regions of the United States	Administered Canfield's LSI	Found little support for using the Canfield LSI in accounting education research
Emerson and Taylor [2007]	Myers-Briggs	255 students in principles of microeconomics; (48 in sections that relied heavily on classroom experiments)	Administered the MBTI and used TUCE scores, final exam scores, GPA, and demographic measures	ESTJs and ISTJs perform better in the nonexperimental approach
Fallan [2006]	Myers-Briggs	148 students in principles of macroeconomics in Norway	Quasi-experiment using MBTI-based questionnaires and standard lecture classes compared to problem-based learning approach	The dominant temperament was SJ, with 65.3% of business students having that temperament. Optional business courses applying a problem-based learning style attracts SP, NT, and NF students. Standard lecture classes attract SJ students. Majors based on facts, procedures, and sequential presentation attracted SJ students, and majors emphasizing people and human relations attract students with SP, NT, and NF temperaments
Fallan and Opstad [2012]	Myers-Briggs	150 business and economics students in Norway	Measured MBTI types and student attitude response toward harder grading practice, student ability, study effort, and gender	Students classed as extrovert, thinking and judging respond more positively to a harder grading practice
Fallan and Opstad [2014]	Myers-Briggs	166 management accounting students in Norway	Looked at personality type as measured by MBTI, gender, and performance	Extroverted students of both genders perform better and SP student perform significantly worse than their SJ and NT peers
Geiger [1992]	Kolb	157 students in an introductory accounting course	Administered Kolb's LSI halfway through the semester of an introductory accounting principles course and looked at exam performance and student course satisfaction	Learning style was found to be significantly related to overall exam performance, with those maintaining a similar learning style as the instructor (i.e., assimilator) performing best. Learning style was also found to affect student ratings of course satisfaction
Geiger and Boyle [1992]	Kolb	718 students in introductory accounting classes and 12 course instructors at 2 universities	Administered Kolb's LSI and looked at course grades and student course satisfaction	No significant effect of student/teacher learning style interaction on final course grade or students' ratings of satisfaction. Instructors having a convergent learning style were given significantly higher satisfaction ratings regardless of student learning style
Holley and Jenkins [1993]	Kolb	49 intermediate accounting I students	Compared performance on four different types of test formats (multiple choice quantitative, multiple-choice theory, open-ended theory, and open-ended quantitative) with learning styles	Learning style was significant for performance on each format except the multiple-choice quantitative format

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Honn and Ugrin [2012]	Felder-Silverman	138 managerial accounting students in two large Midwest universities	Administered the Index of Learning Styles Questionnaire; students completed a managerial accounting task and answered demographic questions	The effects of cognitive misfit negatively impacted performance on a managerial accounting task, and the effect was most pronounced for students with global styles
Jaju, Kwak, and Zinkhan [2002]	Hofstede's cross-cultural framework and Kolb	632 undergraduate business students in India, South Korea, and the United States	The Learning Preference Questionnaire was administered to students	Students from India prefer active experimentation and abstract conceptualization. Students from South Korea prefer reflective observation and abstract conceptualization. Students from the United States prefer reflective observation and concrete experiences
Johnston, Andersen, Davidge-Pitts, and Ostensen-Saunders [2009]	Keirsey Temperament	110 information systems students in South Africa	Used the Keirsey Temperament Sorter and a measure of entrepreneurial ability	A positive relationship between rational and idealist temperaments and potential information and communication entrepreneurs was found. No significant relationships between personality types and potential entrepreneurial ability were found
Kakkonen [2007]	Honey and Mumford	130 undergraduates at business schools in Belgium and Finland	Administered Honey and Mumford's learning style test	The strongest style was reflector (especially among students studying in their home country), followed by pragmatist (especially among students away from their home country)
Karakaya, Ainscough, and Choporian [2001]	Kolb	118 undergraduate principles of marketing students	Used results of the Kolb's LSI in conjunction with course grades; assignments included multimedia components	Assimilators were the most common (44%), followed by convergers (31%). Analysis of covariance indicated no significant differences in test scores based on learning style
Karns [2006]	Felder-Silverman	227 undergraduates in upper-level marketing courses at eight universities	Used adapted Index of Learning Styles Questionnaire; asked students to rate effectiveness of learning activities (such as research paper or role-playing)	There was not a significant difference in perceived effectiveness based on learning style
Kiss, Kotsis, and Kun [2014]	Myers-Briggs	195 economics and business administration students in Hungary	Used an adapted Myers-Briggs questionnaire	Academic performance was significantly influenced by introvert or extrovert, thinking or feeling and, for some, perceiving and judging personality types
Kun, Kiss, and Kapitany [2015]	Myers-Briggs	Total sample size, 354; 224 second- and third-year students in business administration and management (BAM) and 130 business informatics (BI) students	Questionnaire to measure Myers-Briggs type, gender, age, travel time between home and university, and permanent home in the university city	Difference in most frequent types in each major. Most frequent types for both majors were ENFJ and ESFJ. ISTJ, ISFJ, INFJ, ENFP, and ISTP were more frequent in the BAM major and ESTJ, ENFJ, and ENTP were more frequent in the BI major

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Leung, McGregor, Sabiston, and Vriolitis [2014]	VARK	Principles of economics students (n = 910) in a Canadian university over an 18-month period	Administered VARK and examined total percentage grade	Only the kinesthetic learning style showed a significant positive relationship with total percentage grade
Loo [2002a]	Kolb	1,791 business or management majors	Meta-analysis of 7 published studies from 1976 to mid-1999 plus his own data	Found higher proportion of assimilators and a lower proportion of accommodators than if learning styles were equally distributed
Loo [2002b]	Kolb	437 Canadian business students in undergraduate management classes	Administered Kolb's LSI and examined gender and major	Among accounting majors there was a preference for the assimilator style. There were differences between the hard and soft majors. A higher proportion of assimilators were in the hard (accounting, finance, and MIS) majors, and a higher proportion of accommodators were in the soft (HRM, OB, marketing) majors
Marriott [2002]	Kolb	410 accounting students from two UK universities	Looked at students enrolling in 1998–1999 and completing in 2000–2001; administered Kolb's LSI	Dominance of the accommodator style. Over time, students become more concrete and active and less reflective and abstract
McCann, Vaidyanathan, and Morris [1995]	Kolb	84 students in marketing research classes	Experimental method; measured learning style with Kolb's LSI	The sample had 20 assimilators, 20 accommodators, 18 divergers, and 17 convergers. Divergers benefited from using the expert system
McCarty and Bennett [2001]	Keirsey Temperament	Total sample, 189; 83 microeconomics students and 106 macroeconomics students	Examined student and teacher personality type, gender, major, college entrance exam scores, and GPA and correlated with the TUCE pretest and posttest	Students who are Extroverts perform better than Introverts in macroeconomics. In microeconomics, the Introverts appear to perform better than the Extroverts
McCarty, Padgham, and Bennet [2006]	Keirsey Temperament	Total student sample size, 402; 148 microeconomics students, 254 macroeconomics students, and 5 faculty members	Examined student and professor gender and personality type, college entrance exam scores, GPA, class size, and whether microeconomics or macroeconomics	Judging students outperformed perceiving students. Intuitive students outperformed sensing students in macroeconomics.
McChlery and Visser [2009]	Felder-Silverman	735 undergraduate accounting students from the United Kingdom and South Africa	Used Index of Learning Styles Questionnaire; country, age, gender, year in school were the variables considered	No difference was attributed to the year of study. Differences in students' learning styles were not statistically significant, and there was little change in students' learning styles over time
Moore, Change, and Smith [2004]	Kolb	106 undergraduate students in a 300-level IS course	Used Kolb's LSI and end-of-course grade	All four styles were present in the group, with assimilating and converging styles most common. The abstract conceptualization mode was linked to higher course grades

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Morrison, Sweeney, and Heffernan [2003]	Felder-Silverman	Total sample. 377: 174 on-campus and 203 off-campus undergraduate students in a marketing class at an Australian university	Used Index of Learning Styles Questionnaire	Marketing students are more likely to have sensate, visual, and sequential learning styles. On-campus students are more likely to be active learners, while off-campus students are more likely to be reflective learners. Marketing students, especially male students, are particularly unlikely to have verbal learning styles. Also, few marketing students have an intuitive learning style. There was evidence that marketing students prefer teaching styles that match learning styles
Nicholson, Hamilton, and McFarland [2007]	Learning Combination Inventory (LCI) and Interactive Learning Model (ILM)	55 senior-level MIS students	Correlated the results of the LCI inventory with quiz scores	Student strengths in the sequential, confluent, and technical styles was positively correlated with course quiz scores
Ng, Pinto, and Williams [2011]	Felder-Silverman	289 students in Business Statistics	Used the Index of Learning Styles Questionnaire and also measured attendance, pre/post-assessment scores, and grades for the course, exams, project, and quizzes	Learning style was not significant in determining a student's overall course score. For small cohorts of students, learning styles were significant for exam average
Opstad and Fallan [2010]	Keirsey Temperament	296 students in principles of macroeconomics in their second year of study	Looked at Keirsey temperament type and gender interaction	The interaction of gender and temperament type matters in a student's performance. Only females with an SP temperament perform poorer than SJs of both genders. There is no difference for NF and NT female students and SJs. Male NFs do not perform differently from female students
Russo and Kaynama [2012]	Keirsey Temperament	110 students from five sections of an undergraduate business capstone course	Keirsey Temperament Sorter was administered and course grades and gender were used as measures.	Personality types combined with gender produces students who outperform their counterparts in an undergraduate business capstone course. Female students who are feeling and judging outperformed others in the class
Sandman [2009]	Felder-Silverman	348 students in an undergraduate business telecommunications course	Administered the Index of Learning Styles Questionnaire	The most common profile was Active-Sensing-Visual-Sequential (27%); the second most common was Reflective-Sensing-Visual-Sequential (16%)
Sandman [2014]	Felder-Silverman	Total sample size, 1,182; 501 students from computer information systems courses and 681 students from data analysis for managers courses (required courses for all business students)	Administered the Index of Learning Styles Questionnaire	Preferred learning style of students may depend more on the course than the major. Age may be a factor as well

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Stout and Ruble [1991]	Kolb	142 (first administration) and 91 (second administration) junior and senior accounting majors	Kolb's LSI was administered in both standard and scrambled format and then re-administered to a smaller sample five weeks later	Accounting majors are not different from other undergraduate business majors; equivocal evidence that a dominant indicated learning style exists among accounting and other UG business majors; LSI yields rather unstable classifications over time; learning style classifications are affected by the format of the LSI administered (standard vs. scrambled)
Stowe and Clinebell [2015]	VARK	670 business students (113 were international students)	Administered VARK instrument to business students	Most students have multimodal styles. U.S. students with a preference prefer Kinesthetic, followed by Reading/Writing, Auditory, and Visual. International students preferred the Auditory learning style
Tan and Laswad [2015]	Kolb	412 students in an introductory accounting course	Administered Kolb's LSI and evaluated performance on two assignments and two exams	Assimilators were the most dominant groups (38), followed by Convergers (23%), Accommodators (20%), and Divergers (19%). Learning styles are associated with students' performance in different assessment forms
Terregrossa, Englander, and Wang [2009]	Dunn and Dunn Productivity Environmental Preference Survey	125 introductory micro-economics students	Administered the Productivity Environmental Preference Survey (PEPS) and regressed against student achievement on exams, controlling for gender, aptitude, maturity of class cohort, and rigor of exams	Learning style characteristics of students to appear to have a significant relationship to the students' achievement
Yacizi [2005]	Grasha-Riechmann Learning Styles Scale (GRSLSS)	122 juniors and seniors in an operations management course	Students were assessed on collaborative projects, such as role play, discussion, spreadsheet-based simulations, and a team project, and GRSLSS was administered	The three highest scores for undergraduates were as dependent, participant, and collaborative. The collaborative style interacted with competitive and participant learning styles to predict course performance
Zapalska and Dabb [2002]	VARK	Total sample size, 281; (86 New Zealand, 108 Poland, 87 U.S.) undergraduates in various economics courses at three universities	The VARK questionnaire was used in conjunction with student interviews to assess learning style	The four learning styles were found in all student groups. A total of 101 of the 186 had unimodal preferences

Table 2. Literature Review (continued)

Author(s) (year)	Theoretical Base	Sample (no.)	Method	Findings
Ziegert [2000]	Keirsey Temperament	617 students and 11 faculty members of micro-economics principles classes	Keirsey Sorter was administered and student GPA, ACT scores, cumulative credit hours passed previous to that semester, total hours attempted during that semester, and grade in microeconomics and TUCE scores were collected	Students with a preference for Thinking outperform Feeling students. Intuition students perform better than Sensing students on the TUCE exams, but Sensing student outperform Intuition students on course grades. Did not find support that matching student and faculty personality enhances student performance

Abbreviations: TUCE, Test of Understanding in College Economics (a standardized exam); MIS, management information systems; HRM, human resource management; OB, organizational behavior; IS, information systems; GPA, grade point average.

Whiting, and Wynn-Williams, 2004; Auyeung and Sands, 1996; Booth and Winzar, 1993; Marriott, 2002; Tan and Laswad, 2015]. Baker, Simon, and Bazeli found that the accounting students were more likely to be the converger style, followed by accommodator, diverger, and assimilator. However, Adler, Whiting, and Wynn-Williams [2004] found that the converger learning style was not as prevalent among accounting students as earlier literature had described. Other studies found that the dominant learning style of accounting students was the accommodator style [Marriott, 2002], the assimilator style [Tan and Laswad, 2015], or was dependent upon nationality [Auyeung and Sands, 1996]. Ultimately, there is not a definitive conclusion on the predominant learning style of accounting students.

Economics Students

While studies in accounting tended toward cataloging students' dominant learning types, studies sampling economics students investigated the effects of learning styles on performance. Fourteen studies examined whether learning styles, broadly defined, impacted student learning [Boatman, Courtney, and Lee, 2008; Borg and Shapiro, 1996; Borg and Stranahan, 2002; Brunton, 2015; Chowdhury and Amin, 2006; Emerson and Taylor, 2007; Fallan and Opstad, 2012; Kiss, Kotsis, and Kun, 2014; Leung, McGregor, Sabiston, and Vriliotis, 2014; McCarty and Bennett, 2001; McCarty, Padgham, and Bennet, 2006; Opstad and Fallan, 2010; Terregrossa, Englander, and Wang, 2009; Ziegert, 2000]. We use the term broadly defined, because some of those studies looked at Myers-Briggs types, Keirsey Temperament types, and the Big Five Model of Personality.

Of the 14 studies using economic classes and/or students as samples, 13 saw some relationship between their measure of learning styles and student performance. Because the studies used different models, developing a cohesive finding

is difficult. Sometimes even studies that used the same models had differing results. For example, applying the Myers-Briggs model, Borg and Shapiro [1996] found that SJs (students scoring high on Sensing and Judgment) performed the best. Emerson and Taylor [2007] found that ESTJs and ISTJs performed better, both types having ST in common. Borg and Shapiro [1996] found that introverts performed better than extraverts, while McCarty and Bennett [2001], applying Keirsey Temperament Sorter, found that extraverts performed better than introverts in macroeconomics, but introverts performed better than extraverts in microeconomics. McCarty, Padgham, and Bennet [2006], also applying the Keirsey Temperament Sorter, found that judging (J) students outperformed perceiving (P) students, and students scoring high in intuition (N) outperformed sensing (S) students. Ziegert [2000], applying the Keirsey Temperament Sorter, found that students with a preference for thinking (T) outperformed feeling (F) students, and students with a preference for intuition (N) outperformed sensing (S) students. As can be seen from this discussion, there are no consistent results regarding Myers-Briggs types or Keirsey Temperaments and student performance.

The two studies conducted in economics classes that used VARK also found conflicting results. Boatman, Courtney, and Lee [2008] found that a visual learning style positively influenced student learning, while Leung, McGregor, Sabiston, and Vrioliotis [2014] found that only a kinesthetic learning style showed a significant positive relationship with the final grade.

Business Students at Large

Since much of the research on learning styles within the business education literature is focused on accounting and economics students they were emphasized in the prior discussion. When we look at all the studies combined, we find use of thirteen different models with similarly discordant findings. We should be cognizant that applying a multitude of models makes developing cohesive conclusions more difficult. However, we are not suggesting that everyone fit their research into one model for the sake of parsimony.

Twenty studies were focused on determining dominant learning styles [Adler, Whiting, and Wynn-Williams, 2004; Auyeung and Sands, 1996; Bernardes and Hanna, 2009; Booth and Winzar, 1993; Fallan, 2006; Jaju, Kwak, and Zinkhan, 2002; Kakkonen, 2007; Karakaya, Ainscough, and Chopoorian, 2001; Kun, Kiss, and Kapitany, 2015; Loo, 2002b; McCann, Vaidyanathan, and Morris, 1995; Marriott, 2002; Moores, Change, and Smith, 2004; Morrison, Sweeney, and Heffernan, 2003; Sandman, 2009; Stout and Ruble, 1991; Stowe and Clinebell, 2015; Tan and Laswad, 2015; Yacizi, 2005; Zapalska and Dabb, 2002]. Slightly over half of those studies used Kolb's Learning Style Inventory model. Three studies assessed learning styles by applying the Myers-Briggs Type Indicator, three studies used VARK, two studies used the Felder-Solomon Index of Learning Styles Questionnaire, one study used Honey and Mumford's Learning Styles Questionnaire and one study used the Grasha-Riechmann Learning Styles Scale.

Because of the differing models used and different samples, it is difficult to determine whether there is a dominant learning style for business majors.

Another strand of research investigates whether the matching of teaching and learning styles is beneficial to student learning. An early study by Charkins, O'Toole, and Wetzel [1985], using the Grasha-Riechmann Learning Styles Questionnaire, found that the matching of teaching and learning styles is related to students' attitudes toward economics. This finding led to subsequent studies on the topic, which had mixed results. Applying the Myers-Briggs Type Indicator in upper-level economics classes, Borg and Shapiro [1996] found that students whose temperament type matched that of the professor did significantly better than if there was a mismatch. Likewise, Geiger [1992], administering Kolb's LSI in an introductory accounting class, found that students with similar learning styles to the professor performed the best. However, Clark and Latshaw [2012], using the Felder-Silverman Learning Style Model in an introductory accounting class, Ziegert [2000], using Keirsey Temperament Sorter in microeconomics principles class, and Geiger and Boyle [1992], using Kolb's LSI in introductory accounting classes, found that the teaching and learning style interaction was not significantly related to student performance. Of note is that Geiger [Geiger, 1992; Geiger and Boyle, 1992] found conflicting results using the same measure in the same level and type of class (introductory accounting classes).

Although this paper focuses on undergraduate students' learning styles, there is interest at the Master of Business Administration (MBA) level, as evidenced by Drago and Wagner [2004] and Goorha and Mohan [2009]. There is also interest outside of the field of business and outside of the United States, as evidenced by studies examining learning styles of Chinese architectural students [Kvan and Yunyan, 2005], occupational therapy students [Paulrah, Alil, and Vetrayan, 2013], Egyptian nursing students [Shousha and Rahman, 2014], and dietetics students [Mitchell and Nyland, 2005], for example.

DISCUSSION

Identifying clear findings from this literature is problematic. One reason is experimental design. Consistent with prior critiques, all of these studies rely on comparing student responses to whatever pedagogy the instructor used for the course as a whole [Willingham, Hughes, and Dobolyi, 2015; Pashler, McDaniel, Rohrer, and Bjork, 2008].

A second complication for faculty evaluating research is that numerous models have been used. It is difficult to determine if there is a dominant learning style if one study uses Kolb's model, another study uses Myers-Briggs, and still another uses VARK.

A third issue is how learning style is defined. Although Myers-Briggs and the Keirsey Temperament Sorter types have been used as proxy for learning style in many research studies, they are more closely related to personality theories. Many

researchers use VARK as a learning style instrument [Alexandra and Georgeta, 2011] and even Fleming's own website (www.vark-learn.com) uses the term learning style, yet others consider VARK to be a learning preference rather than a learning style, because it does not take into account all aspects of learning style [Hawk and Shah, 2007]. However, returning to Grasha's [1990, p. 26] definition of learning styles as "the preferences students have for thinking, relating to others, and particular types of classroom environments and experiences," it appears that the definition of learning style is broad enough to encompass VARK, Myers-Briggs, and the Keirsey Temperament Sorter. Consistent with Curry's [1990] criticism of learning style research, more development work needs to be done on the definition of learning style.

CONCLUSION

The field of learning styles is interesting to professors because they want to provide the best learning environment for their students. Table 1 notes an introductory website for each of the models for faculty who wish to assess their own students. The review of the literature illustrates that it is difficult to come to any actionable conclusions about the relationships between learning styles and students' performance or whether the matching of professors' and students' learning styles is important. At least thirteen different models have been used in the past 25 years of learning style research involving business students. The confounding results may simply be due to measurement issues or may be due to lack of importance of learning styles. This examination has demonstrated a consistent inconsistency in this research area. Faculty are encouraged to evaluate their own assessment and pedagogical design. As Rohrer and Pashler [2012] noted, ". . .there presently is no empirical justification for tailoring instruction to students' supposedly different learning styles. Educators should instead focus on developing the most effective and coherent ways to present particular bodies of content, which often involve combining different forms of instruction, such as diagrams and words, in mutually reinforcing ways." Given the results of our comprehensive literature review, we agree with Rohrer and Pashler's findings; however, we consider learning about different learning styles to still be a valuable tool for business faculty. There are differences in preferred learning styles, and a well-rounded approach would aid in developing the mutually reinforcing teaching methods mentioned by Rohrer and Pashler. Also, understanding learning styles would aid faculty when they are asked that question, "How should I study for your test?" The answer may lie more in how the student learns, not the test itself.

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Academic Dishonesty Among Business Students: A Decade Later

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This study provides insight into the changing views of both students and faculty regarding academic dishonesty. Over a decade ago, in 2006, the authors surveyed more than 600 business students at three colleges. The goal was to garner a clearer understanding of student definitions of, and participation in, cheating activities. It was found that gender and age mattered in measures of cheating. The research found significant differences between student and faculty definitions of academic dishonesty. Students admitted to much more cheating behavior than expected; in addition, what students considered cheating was very different from what professors considered cheating [Stowe, Schwartz, Sendall, & Michelson, 2009].

Trends observed a decade ago continue today. This new study found that students are more accepting of cheating in 2016 than in 2006. Students, in general, admit to more cheating and intent to cheat. They also view cheating behavior as less severe in 2016 and accept more justification for cheating. Faculty reported that they consider cheating as more severe than students do in both periods; however, faculty also view most behaviors as less severe in 2016 than in 2006. Again, the difference in perceptions between students and faculty highlight the importance of clear communication about what constitutes cheating.

Keywords: Academic Dishonesty, Cheating, Ethics, Honor Code, Integrity

Disciplines of Interest: All Business Disciplines

INTRODUCTION

Cheating scandals seem to be occurring in a multitude of places. Higher education, K–12 education, police academies, large corporations, and athletics

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have all provided examples. Since the previous survey was conducted in 2006, cheating scandals have occurred at Harvard University [2012], the University of North Carolina at Chapel Hill [2010], the Coast Guard Academy [2016], the Atlanta Public Schools [2009], the Pennsylvania State Police Academy [2015], Volkswagen [2015], Kobe Steel [2017], the Boston Red Sox [2017] and more. Intellectual property theft is estimated to cost American firms \$600 billion per year [Blair and Alexander, 2017].

The dispersion of news via social media outlets may make college students more aware of cheating across society. In the workplace, social media users act differently than do employees who are not on social media; the users are less likely to raise questions about unethical behavior. Whistleblowers who do have an active social media presence are more likely to receive retaliation [Brooks, 2012].

Moreover, technology has enabled new methods of cheating that were not possible a decade ago. Information may be accessed through cell phones, text messages, pen cameras, smart watches, Bluetooth devices that are small as hairpins, and text-based memory calculators. One student may take tech-enabled photos of questions to send to a friend outside the classroom, who then sends answers back to the sender [Shinde, 2015]. Anonymous, location-based apps allow students to leave an exam and “snap” or “yak” exam questions to subsequent exam takers; apps are also used in large lecture halls during exams [Fabris, 2016]. Faculty think that students in online courses cheat more often than students in traditional courses (Guyette Jr., King, & Piotrowski, 2008). Quiz scores were lower for those in class, indicating students cheat less when they are being proctored [Ely, Henderson, & Wachsmann, 2013]. Online courses are subject to CAMEO, which occurs when students create more than one account and then copy answers using *multiple existences online*. One estimate is that 1 to 2 percent of MOOC certificates are earned with aid of cheating by CAMEO [Northcutt, Ho, & Chuang, 2015].

Academic dishonesty has become more common in higher education. Josien and Broderick [2013] reported that about 35 percent of respondents self-reported cheating in college. More than half of students who self-reported cheating used multiple methods. Sheets and Waddill [2009] reported that 40 percent of students used technology to cheat. Similarly, McKendall, Klein, Levenburg, and de la Rosa [2010] found 36 percent of students reported trivial cheating (e.g. copied another student’s homework) and 15 percent reported serious cheating (e.g. allowed someone else to do one’s work and turned it in as one’s own). Women are cheating more frequently, especially on work that is worth a low percentage of a course grade [Mathison, 2010; Bernardi, Banzhoff, Martino, & Savasta, 2012]. Burrus, McGoldrick, and Schuhmann [2007] reported that 71 percent of students surveyed had witnessed cheating, whereas 20 percent witnessed a student who had been caught cheating. Cheating is increasing on both in-class and out-of-class work. Coastal Carolina University has compiled an online list of essay-writing

services or “paper mills.” The count rose from 35 in 1999, to 250 in 2007, with too many to count in 2016.

Cheating occurs via multiple methods. “Old school” still applies. Students use the written word (e.g. crib notes, skin writing, fingernail writing, clear bottles, eraser writing). They write in clothing (e.g. baseball caps, long-sleeved shirts, Band-Aids) and on classroom props (desks, chairs, wall art). Other “old school” methods include communicating in codes, traveling to cheat (e.g. notes in the bathroom), aisle roaming, impersonation, and distracting the professor [Bramucci, 2003; Clabaugh & Rozycki, 2006; Hirsch, 2007; Tallahassee CC (n.d.)].

LITERATURE REVIEW

What is cheating? Most of us can likely answer that question without hesitation. However, in higher education, the answer to that question differs depending on whether you are a student or a faculty member. According to Burrus, McGoldrick, and Schumann [2007], “Students do not understand what constitutes cheating.” In a study where the authors compared pre- and post-definition cheating behaviors, students are much more likely to report cheating after cheating had been explicitly defined for them. Information from professors, via talks or lectures, is the most common way that students learn about cheating and plagiarism [Jones, 2011].

One question is how the perceptions of academic dishonesty differ among millennial students. Millennials view information as an open and accessible commodity and see ideas as belonging to everyone [Van Zyl & Thomas, 2015]. Millennials are more likely to see collaboration as team work rather than as cheating and may have a more lenient view of which activities are cheating (Wotring & Bol, 2011; Wotring, 2007). However, Mathison [2010] found that millennials may be more ethical than students from other generations.

The definition of cheating among students is influenced by students’ perceptions [Kennedy, Bisping, Patron, & Roskelley, 2008; Burrus, Jones, Sackley, & Walker, 2013; Hall & Berardino, 2006; Josien, Seeley, Czipak, & Rampal 2015; McKendall, 2010; Megehee & Spake, 2008; and Smith & Feng, 2013]. Kennedy, Bisping, Patron, and Roskelley [2008] found that a student’s perception of what represents misconduct is a key element of one’s decision to cheat. According to Burrus, Jones, Sackley, and Walker [2013], cheating is lessened when students perceived that their peers are more likely to report the misconduct. The authors also found that it was not a significant deterrent for students to cheat if they perceive that a faculty member will detect cheating and confront them. Further, it is the perception of peers’ inclination to cheat that drives student cheating behavior. McKendall et al. [2010] found that “trivial cheaters” exhibited a greater probability of participating in cheating behaviors when they did not perceive their professor to be fair. Perceptions of peer behavior were positively associated with cheating, according to Megehee and Spake [2008]. The authors also found that

students do not view cheating behaviors to be absolute; that is, behaviors fall on a continuum.

Students are more likely to engage in some cheating behaviors than others. Academic dishonesty perceived as “passive” (e.g. using a false excuse to delay an exam) had a low correlation with intention to cheat, whereas dishonesty viewed as “active” (e.g. copying answers from someone else’s exam) had a higher correlation with intention to cheat. Females were more likely to engage in passive academic dishonesty, and males were more likely to engage in active academic dishonesty [Anitsal, Anitsal, & Elmore, 2009]. Age and GPA are also predictors of cheating [Klein, Levenburg, McKendall, & Mothersell, 2006; Sheets & Waddill, 2009]. Males, students with low GPAs, and those who are early in their academic experience are more likely to cheat, as are students who feel alienated from the community. Students with high GPAs, who believe themselves to be honest, who are non-athletes, and/or who are not members of a Greek organization are less likely to cheat. A student is less likely to cheat if he or she perceives that peers will detect the cheating [Burrus, Jones, Sackley, & Walker, 2013; Atmeh & Al-Khadash, 2008; Burrus, McGoldrick, & Schuhmann, 2007].

Faculty perceptions have also been studied. Burrus, Graham, and Walker [2011] found that faculty perceived student cheating to be a major problem. Faculty rated themselves to be “moderately diligent” in exposing cheating but perceived their faculty peers to be less diligent. Hall [2006] found that business faculty hold “strict, unyielding views on what constitutes cheating” when it comes to online examination behavior. The author also concluded that generational differences exist when it came to perceptions of faculty and students.

Faculty perceive more activities to be cheating than students. The perceptions of freshmen are most different from those of faculty, whereas the perceptions of seniors are most similar to faculty [Josien et al., 2015]. Peers influence faculty, as those who believe that others are tough on crime are themselves more likely to prosecute honor code violations [Burrus, Graham, & Walker, 2011].

Cheating behavior in one context carries over to others. Unethical behavior at work is positively correlated with academic dishonesty at college [Anitsal, Anitsal, & Elmore, 2009]. Business students are more likely than other professional students to cheat on activities done outside of the classroom, beyond what a faculty member may easily see. However, they are no more or less likely to cheat during an in-class exam than other students [Klein, Levenburg, McKendall, & Mothersell, 2007]. Simha, Armstrong, & Albert [2012] found that business students consistently viewed cheating behaviors as less serious than did leadership students.

Cheating is less prevalent at schools with a strong honor code. Students at a university with a strong honor code reported having seen fewer incidences of cheating than did students at a university without a formal honor code [Burrus, McGoldrick, & Schuhmann, 2007]. Approximately 17 percent of students at the three main U.S. military academies self-reported cheating, which is lower than at previously reported results at other schools [Carrell, Malmstrom, & West, 2008].

The academies are not immune; in 2016, forty students at the Coast Guard Academy were punished for online cheating [Zamudio-Suarez, 2016]. Business courses have mixed results in influencing cheating [Reisenwitz, 2012]. High-GPA students who took an ethics course were less likely to be accepting of cheaters than students with low GPAs who took the same ethics course [Bloodgood, Turnley, & Mudrack, 2010].

According to Bing et al. [2012], explicit reminders or honor code presentations by faculty to students and cheating-related course warnings were methods that significantly reduced cheating. This practice was particularly helpful when both the honor code and course warnings were presented to students at the start of the semester. Similarly, faculty may reduce cheating by giving students both a reminder and a warning [Ely, Henderson, & Wachsman, 2013]. The authors found that students who signed an honor code had statistically significant lower scores, signifying that they were cheating less. Having students write an essay as to why integrity is important did not significantly affect their test scores. Caldwell [2010] asserts that business schools and faculty who “clearly communicate to their students the value of personal integrity” and the imprudence of academic dishonesty help create a culture of integrity. Mazar, Amir, and Ariely [2008] found that asking the students to write the Ten Commandments in a recall task led to less cheating on a subsequent math task, implying that moral reminders have value. Asking students to write the honor code also works as a moral reminder. Abdolmohammadi and Baker [2007] found that plagiarism is less common among students who demonstrate moral reasoning. They also discovered that plagiarism increases at the end of the semester and is inversely related to GPA. Bloodgood, Turnley, and Mudrack [2008] found that students who reported religion as personally important were less likely to cheat. Megehee and Spake [2008] wrote that, “Institutions can reduce cheating by fostering a culture of academic integrity.” The institution must create policies and procedures and be willing to enforce sanctions that, in the end, will motivate students to present their work honestly.

METHODOLOGY

In spring 2016, the authors surveyed business students at the same three private universities surveyed in 2006. A few students from three neighboring schools were included in 2016 due to very low response at one of the original schools.

The number of respondents per school is shown below. The median enrollment of the universities in 2016 was 3,360 students and in 2006 was 2,015 students [IPEDS, 2017]. The median rose due to enrollment growth at each of the three core universities.

In the original sample, there were 50 percent male and 50 percent female respondents. In the more recent sample, 49 percent of respondents were male, and 51 percent were female. (A correction was made to the 2006 paper, which

Table 1. Sample Information

	Percentage of respondents, 2006	Percentage of respondents, 2016
University A	31%	50%
University B	49%	20%
University C	19%	5%
Other	—	25%
Male	50%	49%
Female	50%	51%

reported 69 percent female). The average GPA was 3.2 in 2006 and 3.3 in 2017, and the average age was 21 for both time periods. Overall, the demographics do not appear to have any significant difference in participants that would affect the comparison of results.

The questionnaire was the same as the one used in 2006, with a modification to reflect availability of smart phones and similar devices. The original instrument was adapted from questionnaires by Smith, Ervin, and Davy [2003], Nonis and Swift [2001], Swift and Nonis [1998], and Ameen, Guffy, and McMillan [1996]. The key variables addressed are definitions of cheating, justification for cheating (neutralizing attitudes) and the rate at which students engage in, and expect to engage in, dishonest behavior.

The students were asked a series of 11 questions about different types of cheating behavior to see if they had participated in these activities in the past and if they intend to participate in these activities in the future. Students rated the severity of the different cheating activities. They were also surveyed about several common justifications for cheating. Answers were scored using Likert-type scales.

Faculty were surveyed about their perceptions on the severity of cheating activities. They were asked the same questions that students were asked; unfortunately, a question on sharing homework when instructed to work independently was inadvertently omitted from the faculty survey in 2016. Student and faculty responses from 2006 were compared with 2016 responses and tested to see if the responses were significantly different.

DATA ANALYSIS

Table 2 compares admitted cheating behavior in 2006 with admitting to cheating behaviors in 2016. For all cheating behaviors, student mean responses are below 3, which means that they are not cheating often or very often, but some activities had means above 2.0. Those activities are related to asking for information on exams, sharing homework, and asking for help when instructed to work alone.

In both 2006 and 2016, asking someone who has taken the exam for details is the most common behavior, with means of 2.83 and 2.82. This behavior is

Table 2. Admitted Cheating Behavior, 2006 to 2016

	Year	N	Mean	Std. Deviation	Std. Error	P-Value
Asking someone who has already taken an exam for details	2006	579	2.83	1.12	0.05	0.93
	2016	164	2.82	1.12	0.09	
Obtaining a copy of an exam before taking it in class	2006	578	1.29	0.65	0.03	0.01
	2016	165	1.46	0.91	0.07	
Looking at another student’s paper or computer screen during an exam	2006	578	1.33	0.60	0.02	0.00
	2016	165	1.63	0.81	0.06	
Using unauthorized ‘crib’ notes during an exam.	2006	577	1.20	0.53	0.02	0.03
	2016	165	1.32	0.74	0.06	
Lying to a professor about illness, etc., when an exam or assignment is due	2006	578	1.37	0.65	0.03	0.79
	2016	165	1.36	0.77	0.06	
Copying homework from another student when the professor has instructed you to work independently.	2006	579	1.96	0.86	0.04	0.56
	2016	165	2.01	0.98	0.08	
Sharing your homework with another student when the professor has instructed you to work independently.	2006	576	2.37	0.89	0.04	0.36
	2016	165	2.30	1.08	0.08	
Using words from a journal, book, web site, etc., without naming your source	2006	579	1.58	0.78	0.03	0.00
	2016	164	1.82	0.93	0.07	
Borrowing another person’s speech, report or project and turning it in as your own	2006	579	1.09	0.51	0.02	0.29
	2016	165	1.13	0.51	0.04	
Asking for help from another student or professor when the instructions are to work alone.	2006	579	2.02	0.87	0.04	0.00
	2016	165	2.34	1.00	0.08	
Scale	1 (never) to 5 (very often)					

likely more prevalent when there are multiple sections of a course and students ask friends in an earlier section for information on the exam. This type of discussion is commonplace in hallways between classes and is difficult to monitor.

In addition, no significant difference was found in the next most common behavior: sharing homework (mean 2.37 vs. 2.30). This insignificant difference

Table 3. Student Intent to Cheat, 2006 to 2016

	Year	N	Mean	Std. Deviation	Std. Error	P-Value
Asking someone who has already taken an exam for details	2006	579	2.59	1.19	0.05	0.24
	2016	166	2.72	1.20	0.09	
Obtaining a copy of an exam before taking it in class	2006	579	1.38	0.72	0.03	0.05
	2016	166	1.51	0.95	0.07	
Looking at another student’s paper or computer screen during an exam	2006	578	1.30	0.58	0.02	0.00
	2016	165	1.52	0.76	0.06	
Using unauthorized ‘crib’ notes during an exam.	2006	578	1.21	0.54	0.02	0.20
	2016	165	1.28	0.66	0.05	
Lying to a professor about illness, etc., when an exam or assignment is due	2006	578	1.42	0.68	0.03	0.55
	2016	164	1.38	0.82	0.06	
Copying homework from another student when the professor has instructed you to work independently.	2006	578	1.92	0.93	0.04	0.83
	2016	166	1.94	1.03	0.08	
Sharing your homework with another student when the professor has instructed you to work independently.	2006	577	2.29	0.96	0.04	0.56
	2016	166	2.23	1.05	0.08	
Using words from a journal, book, web site, etc., without naming your source	2006	577	1.41	0.68	0.03	0.00
	2016	166	1.59	0.82	0.06	
Borrowing another person’s speech, report or project and turning it in as your own	2006	578	1.10	0.37	0.02	0.74
	2016	166	1.11	0.47	0.04	
Asking for help from another student or professor when the instructions are to work alone.	2006	579	2.01	0.93	0.04	0.00
	2016	166	2.25	1.11	0.09	
Scale	1 (never) to 5 (very likely)					

may be due to students who are friends with each other and tend to do homework together or communicate via text or other social media platforms on a regular basis. Again, this behavior is difficult to detect unless the students all make the same errors on the homework.

Five of the 10 activities became significantly more common in 2016: asking for help when instructed to work alone, obtaining a copy of the exam, looking at

another student's paper or computer screen during an exam, using unauthorized crib notes, and using words without proper documentation (plagiarism). Four of these activities are severe, so the increase in admitted behavior is concerning.

Obtaining a copy of the exam before taking it can be related to the multiple-section problem discussed above. With the increase in camera phones, students may be sneaking photos to pass along to friends in later sections. Using crib sheets may also be related to the numerous phones in classrooms. Students may find it easy to have notes on their phones that can then be accessed during exams. Prohibiting students from utilizing phones for any purpose during exams can help alleviate some of these issues.

Looking at another student's paper or computer screen may be more common due to an increase in the number of classes utilizing computers during exams. It is much easier to look at someone's computer screen that is vertical versus a test paper that lies on a table. This behavior needs to be better monitored during courses using computers.

The increase in plagiarism can also be related to technology. The number of online sources for all types of college-related work has grown so that students can find answers to problems, case studies, essays, and most anything else online in some form. Using Turnitin[®] or other plagiarism-monitoring software can help alleviate the growing problem.

The final significant difference involves asking for help when instructed to work alone. The mean for asking for help in 2016 is similar to the mean for sharing homework when instructed to work alone. The prevalence of communication via technology is likely contributing to the increase in this activity. Students are more connected and can share information more easily than in the past using multiple different methods.

No significant change was found in the least likely behavior of borrowing someone else's work and turning it in as one's own (mean 1.09 vs. 1.13). This behavior remains very unlikely for students, which is encouraging.

The next set of survey questions asked about intent to cheat in the future. All the questions had means below 3.0, which means that students are not intending to cheat at high rates. The most common forms of cheating (asking someone for exam details, sharing homework, and asking for help when instructed to work alone) have the most likely intentions of being continued, with means above 2.0 (see Table 2). The only one of these with a significant difference from 2006 to 2016 was related to asking for help when instructed to work alone. Students intend to do this more in 2016 than they did in 2006. Just as in Table 2, the means for sharing homework and asking for help are very close in 2016. These two activities are likely to continue because students are going to maintain or increase their connectivity due to texting or use of other media platforms.

From 2006 to 2016, a significant increase was found in intention for three of four more serious behaviors: obtaining a copy of the exam, looking at another student's paper or computer screen, and plagiarism. This increase indicates that

cheating is not accidental or a spur-of-the-moment decision. Students intend to continue cheating at least sometimes using many different methods. There seems to be a lack of regret for cheating. If students regretted their cheating behavior, they would indicate a lesser intent to continue these behaviors.

The activities in which students admit the most past cheating and intend to commit future cheating are those which are perceived as less severe, which would be expected. Information on students' perceptions of cheating is provided in Table 4. With means below 2.0 in both 2006 and 2016, asking for test details, sharing homework, and asking for help when instructed to work alone are considered the least severe forms of cheating.

With a mean above 4, the most severe of all the behaviors is turning in another person's work as one's own; however, it is significantly lower in reported occurrence in 2016 than it was in 2006. Using crib notes on an exam is rated as the second most severe form of cheating, which is surprising because students reported a significant increase in using them. The severity of using crib sheets has also decreased significantly, which may lead to the increase in admitted usage.

Of all the activities, students rate seven of the 10 as significantly less severe in 2016 than in 2006. Only copying homework, sharing homework, and plagiarism were not significantly different. It is concerning that even the most severe activities have declined in severity in the eyes of students in the past 10 years. This is consistent with the literature on perceptions of cheating. As cheating is viewed as less serious an offense, it can lead to even more cheating behavior in the future.

In general, students tend to disagree, but not strongly disagree, with cheating justifications. All justifications have means below 3, as reported in Table 5. The strongest justification for cheating was if the student needs the course to graduate, with a mean of 2.73 and a median of 3.0. The weakest justification reported is if the student needs the course to be initiated into a sorority or fraternity.

Students have become significantly more lenient in justifying cheating for all stated reasons over time, and this lenience could be related to the increase in both admitted cheating and intent to cheat.

Table 6 compares how students and faculty perceive cheating behaviors. In all cases, faculty consider the actions to be more severe than students do; however, even faculty agree that the severity of cheating varies for the different activities. The difference in viewpoints reflects what Wotring and Bol [2011] and Wotring [2007] find in their studies on millennials.

The faculty perceive the same activities as less severe that students view as less severe. These less severe activities include asking for exam details and asking for help when instructed to work alone. Interestingly, faculty view lying about illness as less severe than many of the other activities.

The difference between student perceptions and faculty perceptions is significant in all but one case. The most significant difference involves asking details about an exam. The median response for students is 1.0 and 4.0 for faculty. This

Table 4. Student Ratings of Severity of Cheating Activities, 2006 to 2016

	Year	N	Mean	Std. Deviation	Std. Error	P-Value
Asking someone who has already taken an exam for details	2006	578	1.77	1.40	0.06	0.00
	2016	166	1.14	1.21	0.09	
Obtaining a copy of an exam before taking it in class	2006	577	3.96	1.44	0.06	0.08
	2016	166	3.73	1.60	0.12	
Looking at another student's paper or computer screen during an exam	2006	577	3.98	1.16	0.05	0.00
	2016	166	3.61	1.33	0.10	
Using unauthorized 'crib' notes during an exam	2006	579	4.05	1.09	0.05	0.00
	2016	166	3.76	1.25	0.10	
Lying to a professor about illness, etc., when an exam or assignment is due	2006	578	2.48	1.48	0.06	0.00
	2016	166	1.99	1.64	0.13	
Copying homework from another student when the professor has instructed you to work independently.	2006	577	2.23	1.34	0.06	0.81
	2016	166	2.26	1.44	0.11	
Sharing your homework with another student when the professor has instructed you to work independently.	2006	576	1.80	1.29	0.05	0.48
	2016	166	1.89	1.35	0.10	
Using words from a journal, book, web site, etc., without naming your source	2006	579	3.53	1.40	0.06	0.12
	2016	166	3.33	1.54	0.12	
Borrowing another person's speech, report or project and turning it in as your own	2006	577	4.50	0.92	0.04	0.01
	2016	166	4.27	1.25	0.10	
Asking for help from another student or professor when the instructions are to work alone.	2006	576	1.96	1.39	0.06	0.00
	2016	166	1.49	1.29	0.10	
Scale	0 (not cheating) to 5 (most severe)					

difference indicates that more communication needs to take place on what constitutes cheating.

Other activities are clearly considered severe cheating by both students and faculty. The one that shows students and faculty are closest in perception is borrowing someone else's work and turning it in as your own. Both students and faculty have a 5.0 median for this question. Faculty and student perceptions of

Table 5. Student Views on Justification for Cheating, 2006 to 2016

	Year	N	Mean	Std. Deviation	Std. Error	P-Value
A student needs a good grade to maintain a scholarship.	2006	575	2.27	1.15	0.05	0.03
	2016	164	2.49	1.22	0.10	
A student needs a good grade to keep athletic eligibility.	2006	577	2.06	1.15	0.05	0.00
	2016	163	2.44	1.30	0.10	
A student needs a good grade to be initiated into a sorority or fraternity.	2006	575	1.73	0.94	0.04	0.05
	2016	162	1.90	1.07	0.08	
The student’s cheating is not hurting anyone.	2006	563	2.01	1.01	0.04	0.00
	2016	162	2.28	1.09	0.09	
The course is not in the student’s major.	2006	563	2.06	1.02	0.04	0.00
	2016	162	2.40	1.14	0.09	
The student needs the course to graduate.	2006	564	2.44	1.24	0.05	0.01
	2016	159	2.73	1.32	0.11	
Scale	1 (strongly disagree) to 5 (strongly agree)					

plagiarism are not significantly different; thus, both view plagiarism as equally severe. The additional question on using electronic devices is viewed as severe cheating by students and faculty, although significantly more so by faculty. The question on sharing homework when instructed to work independently was inadvertently omitted from the faculty survey.

Table 7 shows how faculty interpretations of the severity of cheating have changed since 2016. In general, faculty have become less strict during the intervening decade but not significantly so. Faculty views of severity of cheating behaviors is lower for seven of nine actions. Only using crib notes is significantly lower in 2016 (mean 4.60 vs. 4.45). Significant increases in 2016 were noted in copying homework (means 3.69 vs. 4.02) and borrowing another's work (4.52 vs. 4.76). Once again, the question on sharing homework was inadvertently omitted from the 2016 survey, so the difference cannot be measured. Because the surveys were given at the same three institutions, some of the same faculty members participated both in 2006 and in 2016. As the students are becoming more lenient in their views on cheating, the faculty are not.

DISCUSSION

The results of this study are consistent with results found by other researchers. A longitudinal approach to cheating behaviors surveyed business students and

Table 6. Comparing Definitions of Cheating among Students and Faculty, 2016

	Students		Faculty		Sig.
	Mean	Median	Mean	Median	
Asking someone who has already taken an exam for details	1.14	1.00	3.47	4.00	0.00
Obtaining a copy of an exam before taking it in class	3.73	4.00	4.65	5.00	0.00
Looking at another student's paper or computer screen during an exam	3.61	4.00	4.39	5.00	0.00
Using unauthorized 'crib' notes during an exam.	3.76	4.00	4.45	5.00	0.00
Lying to a professor about illness, etc., when an exam or assignment is due	1.99	2.00	3.33	4.00	0.00
Copying homework from another student when the professor has instructed you to work independently.	2.26	2.00	4.02	4.00	0.00
Sharing your homework with another student when the professor has instructed you to work independently.	1.89	2.00	n/a	n/a	n/a
Using words from a journal, book, web site, etc., without naming your source	3.33	4.00	3.71	4.00	0.11
Borrowing another person's speech, report or project and turning it in as your own	4.27	5.00	4.76	5.00	0.01
Asking for help from another student or professor when the instructions are to work alone.	1.49	1.00	3.24	3.00	0.00
Using unauthorized electronic devices during an exam (including computer, cell phone, watch, tablet).	4.04	4.50	4.49	5.00	0.02
Scale	0 (not cheating) to 5 (most severe)				

Table 7. Comparing Faculty Views on Severity of Cheating, 2006 to 2016

	Year	N	Mean	P-Value
Asking someone who has already taken an exam for details	2006	58	3.55	0.50
	2016	51	3.47	
Obtaining a copy of an exam before taking it in class	2006	61	4.70	0.58
	2016	51	4.65	
Looking at another student’s paper or computer screen during an exam	2006	61	4.52	0.23
	2016	51	4.39	
Using unauthorized ‘crib’ notes during an exam.	2006	61	4.60	0.03
	2016	51	4.45	
Lying to a professor about illness, etc., when an exam or assignment is due	2006	60	3.58	0.18
	2016	51	3.33	
Copying homework from another student when the professor has instructed you to work independently.	2006	59	3.69	0.09
	2016	51	4.02	
Sharing your homework with another student when the professor has instructed you to work independently.	2006	61	3.55	n/a
	2016	n/a	n/a	
Using words from a journal, book, web site, etc., without naming your source	2006	60	4.43	0.16
	2016	51	3.71	
Borrowing another person’s speech, report or project and turning it in as your own	2006	60	4.52	0.00
	2016	51	4.76	
Asking for help from another student or professor when the instructions are to work alone.	2006	58	3.83	0.34
	2016	51	3.24	
Scale	0 (not cheating) to 5 (most severe)			

faculty ten years apart. Because of faculty longevity, several of the same faculty participated in both the 2006 and 2016 studies.

Students continue to admit to many cheating behaviors. The most common types of behavior occur in a non-monitored environment, such as sharing and copying homework. Students also let their friends know what will appear on an exam. They tend to label these activities as minor cheating and intend to continue this behavior. Technology makes these types of activities much easier. Students

no longer need to meet in person to share work or comments about exams. Text messaging, social media, and smartphones make collaborating easier for students and harder for faculty to monitor. Such activities may not even feel like cheating to the students as they are so accustomed to constant communication with peers.

Students are more accepting of cheating in 2016 than they reported being in 2006. Students in general admit to more cheating and intent to cheat. They also view cheating behavior as less severe in 2016 and accept more justification for cheating. In contrast, faculty consider cheating as more severe than students. However, faculty also view most behaviors as less severe in 2016 than they did in 2006. This difference is likely due to generational differences and shifts in cultural norms. Social media and the sharing of information may make cheating more acceptable. As news reports of many types of unethical behavior are becoming more common, they may desensitize individuals to the seriousness of their dishonest actions.

Regardless of the overall shifts in views, cheating is an ongoing concern among many in education. Faculty need to monitor laptops, smartphones, and, now, smart watches closely. As technology continues to evolve, new devices may emerge that will make this an ongoing concern, and faculty will need to remain vigilant. Faculty must clearly communicate their view of cheating and design environments to reduce the temptation to cheat. For example, some faculty encourage students to collaborate on homework, but other faculty expect independent effort. Without very clear standards, students may believe that cooperation is always acceptable. Ongoing commitment is necessary to align student perceptions with faculty perceptions of cheating.

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Student Perceptions and Learning Outcomes: Evidence from the Education Testing Service (ETS) Major Field Test in Business

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We examine course evaluation data from the core finance course and analyze how these data relate to performance on the finance portion of the Educational Testing Service (ETS) Major Field Test in Business. We find that gender, SAT scores, grade point average (GPA), and concentration all have significant impacts on student performance. We also find that aggregate student perceptions of teaching and of how much knowledge they gained do not relate to the finance ETS score. Finally, we find that students who study finance with an intellectually challenging professor do significantly better on the finance portion of the exam. This result is robust to different data partitions.

Keywords: Student Perception, Student Learning, ETS Major Field Test in Business, Student Demographics

Disciplines of Interest: Business Administration, Finance, Assessment, Education

INTRODUCTION

In this paper, we examine course and instructor evaluation data from the required core finance course in our curriculum and analyze how these data relate to performance on the finance portion of the Educational Testing Service (ETS) Major Field Test in Business. Specifically, we evaluate how ETS exam performance relates to aggregate student perceptions regarding the intellectual challenge of the course, increase in subject matter knowledge by the end of the class, and overall instructor teaching ability. To our knowledge, this is one of the first papers to examine how course evaluation scores relate to standardized exam performance in a particular subject area at a university.

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Numerous papers have examined the overall ETS results for insights into various questions, such as student knowledge relative to that at other institutions [Mirchandani et al., 2001], the correlation between SAT scores and ETS exam results [Mirchandani et al., 2001; Bean and Bernardi, 2002; Bycio and Allen, 2007; Bielinska-Kwapisz et al., 2012a, 2012b), and the importance of grade point average (GPA) in explaining test scores [Bycio and Allen, 2007; Terry et al., 2008; Settlage and Settlage, 2011]). More recently, Settlage and Wollschied [2015] found that the number of courses in a discipline impacted not only the total ETS score, but the subject subscores as well. A separate stream of literature [Ramsden, 1992; Marton and Booth, 1997; Prosser and Trigwell, 1997, 1999] has focused on how teacher effectiveness ratings impact learning outcomes and test performance. However, no papers have analyzed the relationship between teacher evaluations and ETS exam scores.

The paper focuses solely on the finance subscore of the ETS Major Field Exam in Business and extends the previous literature in several ways. First, we control for the typical variables employed in models of ETS determinants, such as standardized test performance, GPA, gender, and concentration. By focusing solely on finance, however, we also can control for the grade of the course where these concepts are taught. For non-finance majors we capture difference in exposure to finance by controlling for the number of finance courses, as well as the time since the core course was taken. Most importantly, however, we incorporate information from the student perception forms in this introductory finance class to assess if average student ratings on key variables relate to demonstrated finance knowledge as determined by their ETS finance subscore. Specifically, the student forms allow us to incorporate variables gauging student perceptions of teaching ability, knowledge attainment, and intellectual challenge.

The remainder of the paper is structured as follows. Section 2 summarizes the previous literature on ETS determinants. Section 3 provides descriptive statistics on ETS scores, as well as other factors that might impact student achievement on the finance portion of the test such as gender, concentration, course grades, GPA, and standardized test scores. Section 4 outlines three different testable hypotheses and provides the empirical results of our finance ETS models. We also examine the robustness of our results by examining several subsamples. Section 5 provides implications and concluding remarks and raises potential questions for future research.

LITERATURE REVIEW

The Educational Testing Service (ETS) Major Field Test in Business is a 120-question, timed, multiple-choice examination testing student knowledge in nine functional areas of business: accounting, economics, management, quantitative business analysis, finance, marketing, legal and social environment, information systems, and international issues. Questions can span more than one topic

area and are not equally weighted. Since 2013, more than 600 colleges and universities have administered the exam, and many use the results as part of their Association to Advance Collegiate Schools of Business (AACSB)-required assurance of learning initiative. A variety of researchers have examined factors affecting student performance on the ETS exam. Allen and Bycio [1997], in a study of 65 accounting students and 368 non-accounting majors, found that test scores were significantly and positively related to SAT scores (both verbal and math) and GPA in business classes. They found performance differences across majors but no differences in performance due to gender.

Bagamery et al. [2005] expanded the set of variables and found that gender (women did more poorly on the ETS exam than did men), GPA in pre-admission courses, GPA in core courses, and whether or not the student took the SATs were all significant contributors to exam performance. Bycio and Allen [2007] found no performance differences based on gender, but found that SAT-V, SAT-M, and GPA in business courses were all significant and positively related to ETS performance. They also constructed a measure of motivation based on surveys taken immediately after a presentation on the importance of AACSB reaffirmation and the use of the test in that effort and immediately before administering the exam. They found student motivation to be positively and significantly related to test performance.

In a similar study, Settlage and Settlage [2011] found that major (accounting majors did better than business administration or marketing majors), business course GPA, and ACT scores were significantly related to ETS scores. They also discovered that women significantly underperformed their male counterparts. Similar results were found by Chowdhury and Wheeling [2013], who examined separately the performance of four student cohorts between 2007 and 2010. They found that gender was a significant factor in explaining ETS scores, as were GPA and ACT scores, but that the magnitudes of the coefficients varied substantially over time. For example, the gender coefficient varied from 4.48 to 9.32 points (the exam is scored on a 120- to 200-point basis). Bielinska-Kwapisz and Brown [2013] explored the gender differences in some detail. Among other things, they discovered that male student exam scores increased given extra-credit incentives but female scores did not.

Ritchie et al. [2014] examined the relation between ETS scores and prerequisite general education course grades (which did not include a core financial management class) for 202 students at a Southeastern public liberal arts institution that evaluates student performance on six general education courses before offering admission to the School of Business. They found that the only factors affecting performance were grades in a second-semester English course (composition and literature), microeconomics and predicted GPA based on admissions criteria.

In one of the few studies to analyze ETS subsection scores, Settlage and Wollscheid [2015], using a relatively small sample of 129 students, find that many results of earlier studies hold at the subsection score levels. For

example, females underperform males in all content areas except marketing and do so significantly in the content areas of accounting, economics, quantitative analysis, finance, and information systems. GPA and ACT scores are significant and positive contributors to the scores in almost all content areas, and major field of study matters—marketing majors underperform management majors in all content areas, and do so significantly in five. It should be noted that most prior studies were constructed using relatively small samples, and the students were generally unique to one institution.

There is also a substantial body of literature on student perceptions of instructor quality and their relationship to learning outcomes. Centra [1977], in a study involving 44 instructors across 72 sections of seven college-level introductory courses, found that ratings of teacher effectiveness and the value of the course to students were highly correlated with mean exam performance. Other researchers [Ramsden, 1992; Marton and Booth, 1997; Prosser and Trigwell, 1997, 1999] have documented the influence that student perceptions of teaching have on learning approaches and learning outcomes. Hoffmann and Oreopoulos [2006] found no relationship between student outcomes and faculty rank, status, and salary, but found that instructors with high perceived quality experience lower dropout rates. Similarly, Cheng [2015] found that tenure status had no effect on undergraduate evaluations of instructor quality. De Paola [2009], in a study of almost 800 students assigned to a first-level business and economics class in an Italian university, found a positive relationship between learning (as measured by course grade) and teacher experience and research activity but little evidence whether or not instructor attributes relate to further study in the field.

In a study of 839 medical students, Stehle et al. [2011] found a strong positive relationship between student evaluations of teaching and scores on a practical exam but no significant relationship between evaluations and performance on a multiple-choice exam. Beleche et al. [2012], in a study of 1,100 students at a public university, found a positive relationship between students' perceptions of course quality and learning outcomes as measured by pre-and post-course test scores, controlling for student demographics. Braga et al. [2014], using standardized course grades as a measure of teaching effectiveness, found a negative and significant relationship between student perceptions of teaching quality and course outcomes. They suggest that the "results challenge the validity of students' evaluations of professors as a measure of teaching quality." (p. 82)

Finally, and perhaps most definitively, Uttl et al. [2017], in a meta-analysis, find that much of the evidence suggesting a relationship between student evaluations of teaching and learning outcomes is an artifact of small sample sizes and/or publication bias. They assert that an analysis of studies of papers involving large-sample, multisection courses reveals that no relationship exists between learning outcomes and perceived instructor quality.

THE DATA

This paper pulls together several data sources from a midsized regional university located in the northeast. The university is accredited by the New England Association of Schools and Colleges (NEASC) and AACSB International. The university is predominantly a business school; about 80 percent of its students achieve a B.S. in Business Administration or a B.S. in International Business degree. All students are required to take a business core class in financial management, which can be taken as early as sophomore year.

The first source of data is compiled from the ETS Major Field Exam in Business, which is administered as part of a capstone class in the first or second semester of the students' senior year. The ETS exam score ranges from 120 to 200 and assesses student competency in nine distinct subject areas: accounting, economics, finance, information systems, international issues, legal and social environment, management, marketing, and quantitative business analysis. Questions can overlap several of the subject areas; for example, a finance question could influence not only the finance score but economics and accounting scores as well, depending on the nature of the question. The ETS exam also reports subsection scores ranging from 0 to 100 for each of these respective areas, allowing faculty and administrators to easily assess areas of possible deficiency in the curriculum or in student comprehension. To ensure that students give their best effort, the university provides a grade increase in the capstone business policy course for superior performance on the ETS exam.¹

A second source of data is the student perception forms that university faculty are required to administer. The student perception surveys are administered online, and instructors are required to allot class time for their completion. Generally, the response rate is over 80 percent. The university employs a survey instrument developed and validated by scholars at another university and about which those scholars have conducted extensive research [Driscoll & Cadden, 2010; Simone et al. 2011]. The perception forms include open-ended questions on course design and content, the usefulness of the class, what students liked about the course, and ways in which the course could be improved. In addition, the student forms have questions with responses on a five-point scale (5 = excellent, 4 = very good, 3 = good, 2 = fair, and 1 = poor). We focus on three questions from the perception forms, which we deemed most important, in part due to the amount of attention paid by university administrators and faculty

1. I have increased my overall knowledge of the subject matter. (1 to 5)
2. I feel challenged intellectually by the course. (1 to 5)
3. Rate the instructor's teaching ability in this class. (1 to 5)

¹Students receive a half-letter grade increase in their course grade in BUS400 (Strategic Management capstone course required for seniors) if they score in the top 20% nationally on the ETS exam. They receive a half-letter grade decrease in their course grade if they score in the bottom 10% nationally on the ETS exam.

Since the surveys are anonymous to protect student identities, we constructed class means for each of these questions. Professor-level means were constructed over academic years (e.g., 2011 to 2012) and may include multiple sections taught during that time period.² Thus, student perceptions of teaching responses were dynamic over the time period, since professors can address student concerns over time. We specifically chose to use professor-level means for these three variables because we wanted to measure overall student perception about the instructor and his/her course, not a particular student's feelings. One student's perceptions may be skewed by idiosyncratic elements of their course, such as time of day.

A third source of student data was obtained from the university registrar. This information included information on student concentration, grades (final GPA and financial management course grade), and standardized test results, as well as information on the number of finance classes taken and their timing. We merged the following three data sets: ETS student scores, average student perception of professor performance, and student-level information from the registrar. Note that ETS periodically makes changes to the exam. In this data set, students took one version of the exam in the earlier years and then a new exam in the later years. We used a dummy variable to control for differences between these two tests.

Table 1 provides summary information on the total ETS scores and each of the subject subscores. The scores range from a low of 44 in the quantitative business questions to a high of 68 on the marketing subscore. We focus on the ETS finance score because the finance subscore represents the largest differential between males and females at our university.

In examining student performance on the ETS finance score we used the following variables:

- **FINSORE:** Reported score on the finance content area of the ETS exam, ranging from 6 to 100.
- **ATHLETE:** An indicator variable taking on a value of 1 if the student participated in National Collegiate Athletic Association (NCAA) Inter-collegiate athletics, and 0 otherwise.
- **HONORS:** An indicator variable taking on a value of 1 if the student participated in the University Honors program and 0 otherwise.
- **FEMALE:** An indicator variable taking on the value of 0 for males and 1 for females.³
- **CONCENTRATION:** A series of indicator variables allowing us to control for the student's field of study (concentration). Management is the default concentration.

²Faculty can teach from one to four sections per semester, and section size can vary from 10 to forty students. Aggregation across the sections taught by the instructor in any given academic year should mitigate small-sample problems for those professors teaching small classes or few sections.

³During the 2010 to 2016, no students were classified as transgendered.

Table 1. Descriptive Statistics

Variable	Panel A (full sample, <i>n</i> = 2,038)		Panel B (females, <i>n</i> = 809)		Panel C (males, <i>n</i> = 1,229)		Panel D (difference, females minus males)		Significance
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Difference	<i>t</i> difference	
ETS scores									
Total score	160.169	10.832	157.203	9.955	162.122	10.947	-4.919	-10.488	***
Finance score	50.917	16.369	45.716	14.094	54.340	16.858	-8.624	-12.490	***
Management score	64.178	11.743	64.147	11.845	64.199	11.680	-0.051	-0.096	
Accounting score	50.480	15.736	47.902	15.167	52.177	15.879	-4.274	-6.109	***
Economics score	47.808	15.334	43.467	13.988	50.665	15.516	-7.198	-10.879	***
Quantitative business score	44.201	14.953	41.794	14.283	45.785	15.176	-3.992	-6.021	***
Marketing score	68.562	13.487	67.428	13.821	69.308	13.216	-1.881	-3.058	***
Information systems score	57.979	14.933	56.713	14.498	58.812	15.160	-2.099	-3.140	***
Legal social environment score	63.806	14.781	61.381	14.516	65.402	14.743	-4.021	-6.081	***
International issues score	52.730	17.450	50.839	16.810	53.979	17.756	-3.140	-4.034	***
Demographics									
ATHLETE	0.153	0.360	0.150	0.357	0.155	0.362	-0.005	-0.310	
HONORS	0.106	0.308	0.130	0.336	0.090	0.287	0.039	2.746	***
Concentration									
Accounting	0.250	0.433	0.244	0.429	0.254	0.435	-0.010	-0.530	
Finance	0.219	0.414	0.100	0.300	0.297	0.457	-0.197	-11.733	***
Marketing	0.221	0.415	0.320	0.467	0.155	0.362	0.165	8.493	***
International Business	0.124	0.329	0.152	0.359	0.105	0.307	0.047	3.064	***
Computer Information Systems	0.024	0.153	0.011	0.105	0.033	0.178	-0.021	-3.419	***
Entrepreneurship	0.028	0.165	0.016	0.126	0.036	0.186	-0.020	-2.858	***
Management	0.135	0.342	0.157	0.364	0.120	0.326	0.037	2.312	**
Test scores/grades									
SAT-M	585.954	62.027	576.836	61.087	591.957	61.933	-15.121	-5.437	***
SAT-V	546.894	62.329	547.522	62.941	546.481	61.945	1.041	0.368	
GPA	3.164	0.391	3.259	0.364	3.101	0.396	0.158	9.274	***
FMGRADE	2.965	0.788	3.000	0.786	2.943	0.788	0.057	1.596	
NUMFIN	1.348	1.572	1.410	1.399	1.308	1.676	0.103	1.499	
TIME	10.800	8.689	12.231	7.986	9.858	9.002	2.373	6.236	***
VERSION	0.411	0.492	0.395	0.489	0.489	0.496	-0.094	-4.236	***
Student teaching perceptions									
TEACH	3.694	0.817	3.753	0.789	3.655	0.833	0.098	2.683	***
LEARN	4.014	0.474	4.055	0.461	3.986	0.481	0.069	3.235	***
CHALLENGE	4.299	0.364	4.323	0.347	4.284	0.374	0.039	2.404	**
TEACH-HIGH	0.568	0.496	0.550	0.498	0.595	0.491	-0.045	-1.986	**
LEARN-HIGH	0.584	0.493	0.565	0.496	0.613	0.487	-0.048	-2.171	**
CHALLENGE-HIGH	0.649	0.478	0.637	0.481	0.666	0.472	-0.029	-1.349	

*, **, and *** indicate significance at the 10%, 5%, and 1% levels of significance, respectively in two-tailed tests.

- SAT-V: Reported score on the verbal portion of the Scholastic Aptitude Test.⁴

⁴In the case of multiple test taking, the Office of Admission uses the highest score. We follow a similar path for both SAT-Verbal and SAT-Math.

-
- SAT-M: Reported score on the mathematics portion of the Scholastic Aptitude Test.
 - GPA: The student's overall GPA at graduation, reported by the Office of the Registrar.
 - FMGRADE: The student's grade in the university's introductory financial management course.⁵
 - NUMFIN: For non-finance majors, we report the number of finance classes taken.⁶
 - VERSION: A dummy variable coded 0 for those students who took the version of the ETS exam administered prior to June, 2013, and 1 for those students who took the new version of the ETS exam.⁷
 - TIME: The length of time (in months) between when the student completed the introductory financial Management class and the ETS exam. This number is reported for non-finance concentrators only.⁸
 - TEACH: Average student perception of professor's teaching ability, based on academic-year averages across all sections taught by the instructor.
 - LEARN: Average student perception of how much they learned in the course, based on academic-year averages across all sections taught by the instructor.
 - CHALLENGE: Average student perception of how challenging they perceived the course to be, based on academic-year averages across all sections taught by the instructor.
 - TEACH-HIGH: 0 if average student perception of professor's teaching ability fell below the academic-year average across all sections of the core finance class, 1 if it exceeded the average.
 - LEARN-HIGH: 0 if average student perception of how much they learned in a course fell below the academic-year average across all sections of the core finance class, 1 if it exceeded the average.
 - CHALLENGE-HIGH: 0 if average student perception of how challenging they perceived a course to be fell below the academic-year average across all sections of the core finance class, 1 if it exceeded the average.

⁵Students may take classes multiple times, either because of failure or to replace a lower grade. We use the recorded grade from the last time the student took the class.

⁶We exclude finance concentrators since they are continually exposed to finance concepts throughout their degree program.

⁷Exactly 1,200 students in our sample took the older version of the exam, 838 took the newer version.

⁸The exclusion of finance concentrators (who typically take 6 or more finance classes and are likely taking one or more concurrently with the ETS exam) lowers the averages reported in Table. In the regression models, the coefficients will relate to non-finance majors only; the TIME and NUMFIN effects for finance concentrators will be embedded in the coefficient on the finance indicator variable.

Many scholars have voiced concerns about using ordinal-level Likert data in ordinary least squares (OLS) regressions [Knapp, 1990; Jamieson, 2004; Carifio and Perla, 2007]. We recognize the possible limitations of using our Likert data from student surveys in our OLS regression analysis. Thus, we have conducted our regression analysis using two different methodologies. First, we conducted the analysis using the raw Likert data (see our TEACH, LEARN, and CHALLENGE variables). Second, we calculated the university means for each of our student perception variables (TEACH, LEARN, and CHALLENGE). Then, we created dummy variables for each element of student perception. We coded TEACH-HIGH as 0 if average student perception of a professor's teaching ability fell below the annual average across all sections of the required core finance class, and as 1 if it exceeded the average. We created similar dummy variables for LEARN-HIGH and CHALLENGE-HIGH. We conducted a second set of regression analyses using these dummy variables instead of the Likert data in the TEACH, LEARN, and CHALLENGE variables. In so doing, we aim to provide an alternative method of analysis to address possible concerns about using ordinal-level Likert data in OLS regressions.

Table 1 provides descriptive statistics for the full sample of over 2,000 students that took the ETS exam over the 2011 to 2016 time period. Panel B and C breaks this information down by gender; Panel D reports the significance of the differences between males and females. Table 1 shows that only 39.7 percent of the sample is female (809/2038). Although we focus on the finance subscore, Table 1 provides information for all ETS subsections. Females do significantly worse on all sections of the exam except for the management section. The greatest gender disparity in the section subscores, however, is the finance sections, with males significantly outperforming females by over 8.5 points (54.34 vs. 45.71).

Female students are significantly more likely be enrolled in the Honors program (13.0 percent vs. 10.6 percent) and have significantly higher GPAs (3.26 vs. 3.16) than their male counterparts. Standardized test scores of the students tell a different story. The sample mean for the Math SAT is 584, but males score significantly higher (591 vs. 576) than their female counterparts. There are no differences, however, in the groups' SAT verbal scores or in their introduction to finance grades.

Part of the finance ETS differential could be driven by the business concentration chosen by the male and female students. Male students are significantly more likely to choose to be a finance (29.7 percent vs. 10.0 percent) or computer information systems (CIS) (2.62 vs. 1.26 percent) major, while female students are more likely to earn degrees in management (15.7 percent vs. 12.0 percent), marketing (32.0 percent vs. 15.5 percent), and international business (15.2 percent vs. 10.5 percent).

When examining student perceptions of teaching, female students take classes that have professors with significantly higher teaching evaluations (3.73 vs. 3.65), learning (4.05 vs. 3.98), and challenge scores (4.32 vs. 4.28). It should be noted

that these evaluations are not student-level, but professor-level and averaged over the course of an academic year.

EMPIRICAL RESULTS

This section examines the determinants of student finance subscores on the ETS major field in business exam. We estimate an ordinary least squares model that controls for several factors, including student demographics, concentration, standardized testing results, and student performance. This paper, however, extends the previous literature by incorporating professor-level information from the student perception forms.

Previous empirical research has shown several factors to be important determinants of overall ETS scores. We follow a similar approach when examining the finance subscore. The general specification of the model can be shown as:

$$\begin{aligned} \text{FINSORE} = & \beta_0 + \beta_1 \text{FEMALE} + \beta_2 \text{ATHLETE} + \beta_3 \text{HONORS} \\ & + \beta_4 \text{ACCOUNTING} + \beta_5 \text{FINANCE} + \beta_6 \text{MARKETING} \\ & + \beta_7 \text{INTERNATIONALBUS} + \beta_8 \text{CIS} + \beta_9 \text{ENTREPRENEURSHIP} \\ & + \beta_{10} \text{SAT-M} + \beta_{11} \text{SAT-V} + \beta_{12} \text{GPA} + \beta_{13} \text{FSGRADE} \\ & + \beta_{14} \text{NUMFIN} + \beta_{15} \text{TIME} + \beta_{16} \text{TEACH} + \beta_{17} \text{LEARN} \\ & + \beta_{18} \text{CHALLENGE} + \beta_{19} \text{GPA} * \text{CHALLENGE} + \beta_{20} \text{VERSION} + \varepsilon \end{aligned}$$

We report the results for several different model specifications of the finance subscore determinant equation, incorporating different elements from the student perception forms, as well as the typical covariates employed in the ETS literature. For example, we control for gender (FEMALE) and hypothesize that there should be no difference in the performance between men and women, controlling for all other variables. Second, we control for intercollegiate sport participation (ATHLETE). Our expectation is that athletes pay a penalty for their sport-related time commitments. Thus, we expect the coefficient on ATHLETE to be negative. Conversely, we expect HONORS students, *ceteris paribus*, to do better on the finance portion of the ETS exam. We also control for student concentration via indicator variables for accounting, finance, CIS, marketing, and international business. The omitted concentration is management. Given that we are focusing on the finance score, we expect students concentrating in finance and other quantitative disciplines, such as accounting, to score higher than students concentrating in management and marketing.

Standardized test-taking ability and overall student knowledge might impact the ETS finance score. Thus, we include both SAT verbal and math scores

(SAT-V and SAT-M) as proxies for standardized test-taking abilities (or as proxies for cognitive intelligence), as well as the student's overall final GPA. We expect all three of these variables to be positively related to the ETS finance subscore. We also include the grade earned in the introduction to finance course (FMGRADE), which is the core course that provides coverage for the material for the exam. For non-finance concentrators only, we also include the time in months (TIME) since the student took the course and the number of finance classes taken (NUMFIN). We expect the higher introduction to finance grade, the higher the finance ETS score, while we expect the length of time since the course was taken to have a negative impact, since student finance knowledge might erode over time. Finally, we include an ETS version dummy, since the difficulty of the finance portion of the exam may differ over the various years.

Most importantly, we are the first paper to our knowledge to incorporate student perception forms into an analysis of the determinants of ETS scores. We pull three critical variables from the introduction to finance student perception forms. Specifically, we include measures of average student perceptions of teaching ability (TEACH), how challenged students feel in the course (CHALLENGE), and how much knowledge the students believed they gained in the course (LEARN). Each question from the course evaluations has associated with it at least one hypothesis about the sign of the relationship between the student perception scores and ETS performance.

Question 1: I have increased my overall knowledge of the subject matter. (1 to 5) (LEARN)

Hypothesis 1: Students will perform better on the finance subsection of the ETS exam if they take their core finance course with a faculty member who, on average, is rated higher in terms of the knowledge gained in his or her course. The sign on LEARN will be unambiguously positive.

Question 2: I feel challenged intellectually by the course. (1 to 5) (CHALLENGE)

Hypothesis 2a: Students will perform better on the finance subsection of ETS exam if they take their core finance course with a faculty member who, on average, is rated as providing a higher level of intellectual challenge in his or her course. The sign on CHALLENGE will be positive.

Hypothesis 2b: Students who take an intellectually challenging course may struggle at times, become frustrated, and lose confidence in their ability to learn key finance concepts. The sign on CHALLENGE will be negative.

Table 2. Regression Results

Variable	Panel A			Significance	Panel B			Significance
	Parm	Std Error	t-stat		Parm	Std Error	t-stat	
Intercept	-35.847	5.787	-6.19	***	-21.906	4.186	-5.23	***
Demographics								
Female	-7.598	0.664	-11.44	***	-7.541	0.665	-11.35	***
ATHLETE	-0.191	0.843	-0.23		-0.273	0.843	-0.32	
HONORS	2.049	1.096	1.87	*	1.998	1.097	1.82	*
Concentration								
Accounting	5.574	1.047	5.32	***	5.549	1.047	5.30	***
Finance	13.296	1.261	10.55	***	13.359	1.254	10.65	***
Marketing	1.368	1.028	1.33		1.461	1.029	1.42	
International Business	1.354	1.448	0.94		1.939	1.406	1.38	
Computer Information Systems	1.315	2.091	0.63		1.604	2.091	0.77	
Entrepreneurship	0.567	1.962	0.29		0.754	1.962	0.38	
Test scores/grades								
SAT-M	0.033	0.006	5.96	***	0.033	0.006	5.86	***
SAT-V	0.028	0.005	5.11	***	0.028	0.006	5.11	***
GPA	9.105	1.120	8.13	***	9.009	1.129	7.98	***
FMGRADE	1.224	0.536	2.28	**	1.271	0.535	2.38	**
NUMFIN	2.188	0.269	8.12	***	2.183	0.270	8.09	***
TIME	-0.026	0.050	-0.53		-0.025	0.049	-0.51	
VERSION	0.082	0.630	0.13		0.316	0.629	0.50	
Student perceptions								
TEACH	-0.305	0.797	-0.38					
LEARN	-0.063	1.498	-0.04					
CHALLENGE	3.780	0.980	3.86	***				
TEACH-HIGH					-0.593	0.882	-0.67	
LEARN-HIGH					-0.328	0.923	-0.36	
CHALLENGE-HIGH					2.497	0.664	3.76	***
No. of observations		2,038			2,038			
R squared		0.334			0.338			
Adjusted R squared		0.333			0.332			

*, **, and *** indicate significance at the 10%, 5%, and 1% levels of significance, respectively, in two-tailed tests.

Question 3: Rate the instructor's teaching ability in this class. (1 to 5)
(TEACH)

Hypothesis 3a: *A priori*, we expect students will learn more and do better on the ETS finance portion from finance teachers receiving high course evaluations on average. Thus, we expect a positive sign on TEACHING.

Hypothesis 3b: Students give high evaluation marks to teachers who require little work and provide high grades. The coefficient on TEACH will be negative.

Table 2 presents from the finance ETS determinant equation that incorporates variables from previous studies as well as the new information from the student perception forms. The table has two panels. Panel A includes three variables (TEACHING, KNOWLEDGE, and LEARN) using ordinal-level Likert data. In contrast, Panel B uses dummy variables indicating whether a professor was above

or below the university average with regard to student perceptions of teaching, knowledge, and challenge.

Student Demographics

Table 2 confirms several results from the previous literature on ETS determinants. First, similar to overall ETS scores, female student score on average seven points lower than their male counterparts on the finance part of the ETS exam. This result is consistent across both panels. Second, student participants in NCAA athletics (ATHLETE) score no differently than their counterparts. This suggests that even with the time commitment associated with athletics, these students appear to manage their time effectively and perform equally to peers in the finance portion of the exam. Finally, student who are in the Honors program (HONORS) score significantly higher than their counterparts. The students completing this program are among the smartest and most conscientious students at the university.

Student Concentration

As expected, the student's chosen concentration significantly impacts the finance ETS score. Specifically, students concentrating in finance will score on average thirteen points higher relative to the omitted management group. This result is not surprising, since these concentrators take a minimum of 6 courses in finance after the introductory course and are exposed to key finance concepts repeatedly during their tenure at the university. As expected, accounting students also score significantly higher, roughly 5.5 points higher in both panels. Given the overlap between accounting and finance concepts, this result is not surprising. There are no other statistically significant differences in finance subscores for any of the remaining concentrations.

Standardized Test Scores/Grades

Both SAT-Verbal and SAT-Math scores are significant and positive contributors to ETS finance subscore performance. Students exhibiting the ability to succeed on standardized tests in the past tend to do better on the finance portion of the ETS exam. Student GPA also has a significant positive impact on the subscore. Students earning overall higher grades do better on the exam. Third, since the finance material covered on the ETS exam is supposed to be included in the introductory finance course, we expect higher course grades to result in a higher ETS finance subscore. This positive relationship holds across both panels. Fourth, the number of finance courses taken may also impact the ETS finance score. We disentangle finance concentrators from this measure by setting this variable equal to zero, since they all take a minimum of six finance courses. Each additional finance course results in a significant increase in the finance subscore

of roughly two points. This result is robust across both model specifications. Finally, given that the knowledge of those students who are not consistently exposed to finance might decline over time, we include a variable that captures the time since the introductory course was taken. The variable has no impact on the finance subscore in either specification.

Exam Version Effects

We control for the difference between the two ETS exams used in this sample (the old exam in the earlier years and then the new exam in the later years). We include this control because ETS states clearly that the subscores from different versions of the exam are not comparable to one another. We find no significant effects for this dummy variable.

Student Perception Form Responses

The major contribution of the paper is the incorporation of student perception form data as an explanatory variable with regard to ETS exam performance. First, and surprisingly, the overall teacher rating (TEACH) in the introductory finance is unrelated to the ETS finance score. In other words, the average student perception of a professor's teaching ability has no impact on the finance subscore. Second, we find that the average student perception of how much knowledge they gained through taking the introductory finance course (LEARN) also has no relationship to the finance subscore. Most importantly, however, when we include a variable capturing the average level of how challenged the student feels in the course, it has a significant impact on the finance ETS score. This effect holds for both Panel A and Panel B, with a high degree of statistical significance for both CHALLENGE and CHALLENGE-HIGH. In fact, CHALLENGE (or CHALLENGE-HIGH) is the only variable from the perception forms to be significantly related to the finance sub-section score.

Robustness Checks

The impact on finance score may be affected by the choice of concentration, especially for finance and accounting concentrators. Second, the finance result score may also differ for students taking more than one finance course. Table 3 provides some robustness checks for our "CHALLENGE" result. Panel A omits finance concentrators from the sample. The CHALLENGE and CHALLENGE-HIGH variables remain positive and significant. Panel B omits both finance and accounting concentrators from the regression, and we get identical results.

Given the significant differences between males and females on their ETS finance scores, Table 4 provides another robustness check by estimating the model for males and females separately. Results are similar to those in previous tables. Most importantly, however, the CHALLENGE variable is similar in magnitude

Table 3. Results Omitting Finance or Finance and Accounting Majors

Variable	Panel A. Omit finance majors								Panel B. Omit finance and accounting majors							
	Parm	Std error	t-stat	Significance	Parm	Std error	t-stat	Significance	Parm	Std error	t-stat	Significance	Parm	Std error	t-stat	Significance
Intercept	-27.884	6.015	-4.64	***	-16.695	4.525	-3.69	***	-17.920	7.376	-2.43	***	-7.270	5.253	-1.38	***
Demographics																
Female	-6.074	0.706	-8.60	***	-6.028	0.706	-8.54	***	-5.045	0.855	-5.90	***	-5.002	0.854	-5.86	***
ATHLETE	-1.004	0.939	-1.07		-1.024	0.939	-1.09		-0.959	1.070	-0.90		-0.945	1.068	-0.89	
HONORS	1.683	1.192	1.41		1.642	1.192	1.38		1.903	1.544	1.23		1.834	1.543	1.19	
Concentration																
Accounting	5.990	1.027	5.84	***	5.986	1.027	5.83	***								
Marketing	1.194	1.003	1.19		1.276	1.004	1.27		1.046	0.990	1.06		1.135	0.990	1.15	
International Business	1.449	1.378	1.05		1.745	1.362	1.28		0.372	1.450	0.26		0.593	1.423	0.42	
Computer Information Systems	1.433	2.043	0.70		1.661	2.041	0.81		1.763	2.020	0.87		1.978	2.015	0.98	
Entrepreneurship	0.579	1.914	0.30		0.722	1.914	0.38		0.400	1.891	0.21		0.544	1.889	0.29	
Test scores/grades																
SAT-M	0.036	0.006	5.79	***	0.035	0.006	5.73	***	0.024	0.007	3.34	***	0.024	0.007	3.26	***
SAT-V	0.026	0.006	4.35	***	0.027	0.006	4.44	***	0.028	0.007	3.93	***	0.029	0.007	4.07	***
GPA	6.929	1.238	5.60	***	6.766	1.244	5.44	***	5.459	1.494	3.65	***	5.201	1.503	3.46	***
FMGRADE	0.961	0.573	1.68	*	1.034	0.577	1.79	*	0.795	0.674	1.18		0.938	0.680	1.38	
NUMFIN	2.297	0.264	8.72	***	2.284	0.264	8.66	***	2.940	0.316	9.29	***	2.921	0.316	9.23	***
TIME	-0.003	0.048	-0.06		0.001	0.048	0.03		-0.026	0.061	-0.43		-0.015	0.061	-0.25	
VERSION	0.750	0.688	1.09		0.862	0.683	1.26		0.444	0.817	0.54		0.489	0.812	0.60	
Student Perceptions																
CHALLENGE	2.925	0.979	2.99	***					2.853	1.279	2.23	**				
CHALLENGE-HIGH					2.195	0.732	3.00	***					2.404	0.909	2.64	***
No. of observations	1592				1592				1083				1083			
R squared	0.298				0.298				0.288				0.289			
Adjusted R squared	0.291				0.291				0.278				0.278			

*, **, and *** indicate significance at the 10%, 5%, and 1% levels of significance, respectively, in two-tailed tests.

and statistically significant for both genders. Again, the result holds whether we use ordinal-level Likert data (CHALLENGE) or the dummy variable indicating whether a professor is above or below the university average (CHALLENGE-HIGH).

CONCLUSIONS

This study supports earlier studies examining student performance on the business ETS exam. Focusing only the finance portion of the exam, we find very similar results; gender, SAT scores, GPA, and business concentration all have significant impacts on student performance. The important contribution of this paper, however, is the assessment of the relationship between student perception form information and ETS results. Using the average professor ratings from the introductory finance course allows us to examine several interesting hypotheses. First, do students who take finance with a faculty member with a high average score for teaching ability do better on the finance portion of the ETS exam? Second, do students who enroll in a core finance course where, on average, students report a high level of attained knowledge exhibit higher finance sub-

Table 4. Results by Gender

	Panel A. Males								Panel B. Females							
	Parm	Std error	t-stat	Significance	Parm	Std error	t-stat	Significance	Parm	Std error	t-stat	Significance	Parm	Std error	t-stat	Significance
Intercept	-42.529	7.280	-5.84	***	-28.075	5.551	-5.06	***	-33.820	8.103	-4.17	***	-19.574	6.146	-3.18	***
Demographics																
ATHLETE	-0.069	1.130	-0.06		-0.240	1.128	-0.21		-0.834	1.243	-0.67		-0.737	1.244	-0.59	
HONORS	2.210	1.530	1.44		2.132	1.531	1.39		2.057	1.531	1.34		1.970	1.532	1.29	
Concentration																
Accounting	4.886	1.459	3.35	***	4.889	1.461	3.35	***	6.533	1.458	4.48	***	6.511	1.459	4.46	***
Finance	13.945	1.639	8.51	***	13.997	1.642	8.52	***	9.748	2.007	4.86	***	9.863	2.010	4.91	***
Marketing	-1.094	1.537	-0.71		-0.986	1.539	-0.64		3.520	1.335	2.64	***	3.573	1.337	2.67	***
International Business	0.735	2.001	0.37		1.226	1.986	0.62		2.115	1.926	1.10		2.496	1.909	1.31	
Computer Information Systems	1.200	2.504	0.48		1.525	2.506	0.61		0.438	4.260	0.10		0.500	4.263	0.12	
Entrepreneurship	-0.319	2.410	-0.13		-0.200	2.414	-0.08		3.747	3.605	1.04		4.036	3.602	1.12	
Test scores/grades																
SAT-M	0.033	0.007	4.48	***	0.033	0.007	4.49	***	0.035	0.009	4.07	***	0.033	0.009	3.90	***
SAT-V	0.030	0.007	4.22	***	0.030	0.007	4.21	***	0.028	0.008	3.35	***	0.029	0.008	3.47	***
GPA	11.109	1.460	7.61	***	11.003	1.466	7.51	***	4.816	1.730	2.78	***	4.717	1.737	2.72	***
FMGRADE	0.932	0.709	1.32		0.939	0.711	1.32		1.467	0.753	1.95	*	1.557	0.762	2.04	**
NUMFIN	2.147	0.346	6.20	***	2.131	0.347	6.15	***	2.233	0.431	5.18	***	2.238	0.432	5.18	***
TIME	-0.018	0.067	-0.27		-0.016	0.067	-0.24		0.011	0.070	0.16		0.016	0.070	0.22	
VERSION	-0.926	0.844	-1.10		-0.745	0.838	-0.89		1.409	0.910	1.55		1.561	0.903	1.73	*
Student perceptions																
CHALLENGE	3.703	1.136	3.26	***					3.644	1.362	2.67	***				
CHALLENGE-HIGH					2.443	0.865	2.82	***					2.424	0.982	2.47	***
No. of observations		1229				1229				809				809		
R squared		0.327				0.326				0.257				0.256		
Adjusted R squared		0.318				0.317				0.242				0.241		

*, **, and *** indicate significance at the 10%, 5%, and 1% levels of significance, respectively, in two-tailed tests.

scores on the ETS exam? Finally, do students who study finance with an intellectually challenging professor do significantly better on the finance portion of the ETS exam?

We find several new and important results. First, the overall student perception of teaching ability has no impact on the finance ETS score. Second, the average student perception of how much knowledge they gained in the course is not related to the finance ETS score when controlling for other factors. Finally, we find that students who enroll in a core finance course with an intellectually challenging professor do significantly better on the finance portion of the ETS exam. This result is very robust to different subsamples, as well as for gender-specific models. This result has important implications for both student learning, as well as faculty assessment.

This paper extends the literature regarding the relationship between student self-assessment of knowledge acquired in a course and objective measures of learning. Sitzmann et al. [2010] conducted a meta-analysis of studies conducted on this topic. They concluded that, “Self-assessed knowledge is generally more useful as an indicator of how students feel about a course than as an indicator of

how much they learned from it” [Sitzmann et al. 2010, p. 180]. Our results regarding perceptions of knowledge attained and perceptions of overall teaching ability confirm their conclusion. We find no relationship between these variables and our objective measure of student learning (the ETS exam finance subscore). However, our findings regarding student perceptions of intellectual challenge provide a new result that warrants further investigation, as this self-assessment, in the aggregate, is positively related to an objective measure of student learning in our study. The paper, however, suffers from several limitations. First, the results are only from one AACSB-accredited university in the Northeast that primarily graduates student with business degrees. Thus, the results may not be generalizable to other schools with different missions, accreditation status, or underlying student attributes. Second, given the anonymity of student perception forms, we were forced to employ class averages. These averages do enable us to measure overall perception of a faculty member and his or her course, rather than a particular student’s perception which may be shaped by idiosyncratic concerns or issues. On the other hand, in a perfect world, we would also have examined student-specific measures of perceived teaching ability, knowledge gained, and course challenge. In that way, we could have examined whether a student who personally feels intellectually challenged exhibited stronger performance on the exam.

Future research should attempt to see if these results are generalizable across different disciplines or if the finance results are outliers. Second, the gender puzzle of why females have higher GPAs yet lower ETS scores holds for finance scores. Is there bias in the ETS test or differences in knowledge retention by gender? Finally, given the limited amount of research tying student perceptions to actual learning, work needs to be done to examine this important link in more detail.

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The Need to Teach the “Qualitative” Option for Determining the Impairment of Goodwill: A Pilot Study Using the Dow 30 Companies

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Accounting educators will need to inform their students of the significant impact of Accounting Standards Update (ASU) No. 2011-08, September, 2011, Intangibles-Goodwill and Other (Topic 350), Testing Goodwill for Impairment (ASU, 2011-08). In 2011, the Financial Accounting Standards Board (FASB) promulgated ASU, 2011-08 [FASB, 2011] to provide relief for reporting entities by reducing the significant accounting costs of determining the annual potential impairment of goodwill. This pilot study attempts to measure the cost savings by using disclosures by the Dow 30 companies. The study also reveals the disparate disclosures of the “qualitative” assessment option. Although this empirical study indicates a positive trend in “Step 0” adopters, many companies did not clearly disclose their application of the “qualitative” assessment option.

Keywords: ASU2011-08, FASB, Goodwill Impairment, Qualitative Option, “Step 0”

Disciplines of Interest: Accounting and Pedagogy

INTRODUCTION

When teaching goodwill accounting, educators need to understand the impact of Accounting Standards Update (ASU) No. 2011-08, September, 2011, Intangibles-Goodwill and Other (Topic 350), Testing Goodwill for Impairment, hereafter referenced as ASU, 2011-08 [Financial Accounting Standards Board (FASB), 2011]. The measurement of goodwill and its potential impairment is complex, and it is therefore difficult for students to master. Goodwill accounting has been transformed by the FASB and the accounting profession from a complex and costly process to a simplified procedure resulting in significant cost savings. Unlike the purchase of any tangible asset, such as a real estate property, or an identifiable intangible asset, in the form of a patent or a

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copyright, goodwill is a residual asset resulting from the acquisition of an entity. Once acquired, goodwill cannot be directly measured; however, like any other asset, it must be at least annually reviewed for potential impairment.

Prior to 2001, under the provisions of Accounting Principles Board Opinion 17 (APB 17), goodwill was viewed as an intangible asset with a finite life and required an annual amortization over a maximum period of 40 years [Accounting Principles Board, 1970]. Under the Statement of Financial Accounting Standards (SFAS) No. 142, June 2001, Goodwill and Other Intangible Assets [FASB, 2001], goodwill was viewed as an intangible asset with an infinite life and required annual assessment of its potential impairment. This annual assessment required a “two-step” procedure that was both complex and costly. In 2011, the FASB issued ASU, 2011-08 [FASB, 2011]. Under the provisions of this update, entities were permitted to apply a “qualitative” option in assessing the potential impairment of goodwill. The objective of this update was to simplify the costly and complex procedures of “Step 1” and/or “Step 2”. In the spirit of simplifying goodwill accounting, in 2014 the FASB issued Accounting Standards Update No. 2014-02, January 2014, Intangibles-Goodwill and Other (Topic 350), Accounting for Goodwill: A Consensus of the Private Company Council. This update allows nonpublic companies the option to treat goodwill as a finite asset and amortize it over a maximum period of 10 years [FASB, 2014].

Recently, the FASB issued ASU No. 2017-04, January, 2017, Intangibles-Goodwill and Other (Topic 350), Simplifying the Test for Goodwill Impairment [FASB, 2017].¹ This update further simplifies the measurement of goodwill impairment by eliminating the second step of the “two-step” process. This second step generally requires the costly services of various valuation specialists, such as real estate appraisers and business valuation experts. We are now at a crossroads where there may be different methods in measuring goodwill. Entities will have the option to measure their goodwill using a “qualitative” approach or using the conventional “Step 1” from the original “two-step” method.

The “two-step” method for measuring the potential impairment of goodwill is costly for the following reasons: “Step 1” requires companies to value each of their reporting units. Large public companies generally have numerous subsidiaries and independent divisions that require valuations. “Step 2” is particularly costly and burdensome, because it requires the valuation of each of the organization’s identifiable assets and liabilities. This second step requires the entity to determine the fair market value of each reporting unit as if it were purchased in a new acquisition [FASB, 2001b].

After the enactment of ASU, 2011-08 [FASB, 2011], we commenced an empirical study on how this update affects the measurement of goodwill impair-

¹Although ASU No. 2017-04 eliminates the costly and complex procedures required under “Step 2,” companies may still use the “qualitative” option under ASU No. 2011-08.

ment for public companies. The motivation for the FASB permitting a firm to apply the “qualitative” assessment of goodwill impairment is to avoid the excessive costs of quantifying the fair value of each company’s reporting unit (“Step 1”) as well as the potential additional costs of valuing the identifiable net assets (“Step 2”).

A sufficient period has elapsed that now allows us to observe whether entities have applied the provisions of ASU, 2011-08 [FASB, 2011], and have achieved the cost savings envisioned by the FASB. Public companies do not disclose the specific costs involved in measuring the goodwill asset; therefore, we use a surrogate measurement of the cost savings expected in applying the “qualitative” assessment option. Our method of operationalizing the cost savings is to observe the number of companies that have passed the “Step 0” test.

The initial objective of our research was to determine the number of companies that have adopted this “qualitative” assessment option in attempting to avoid the significant costs involved in measuring the impairment of goodwill. Using the Compustat database, we applied a simple probability sampling method to select the empirical data for reporting years 2007 to 2014 (approximately 335 sampled companies per year). After examining some of the data, we identified diverse and inconsistent disclosures. In view of these inconsistencies, we decided to commence an initial study comprising the Dow 30 companies’ annual reports to facilitate our extended study. The primary objectives of this initial study are to gain some insight into any difficulties and research limitations and to refine our extended study regarding the research design, such as the selection of relevant and reliable variables affecting the impairment of goodwill, coding schematics, and operationalization.

The paper proceeds as follows. In the next section, the background and literature are reviewed. In section three, we discuss the research design and methodology used in this study. In section four, we analyze the data and provide the empirical results. We will provide a detailed discussion of the results in section five. The last section presents our conclusions.

BACKGROUND AND LITERATURE REVIEW

Goodwill is the collective value that is developed by an entity throughout its history and is attributed to the various intangible characteristics that cannot be separated from the entire valuation of the company. These attributes include such resources as a firm’s geographic location, its customer loyalty, a firm’s relationship with its employees, a firm’s trade secrets, and its talented management, particularly if the company is managed by a generational visionary, such as Steve Jobs or Bill Gates. Often, the most prevalent component is the entity’s employees, especially those with exceptional expertise. For example, exceptional employee talent is present in the computer and internet giants, such as the “FANG” companies: Facebook, Apple, Netflix, and Google. Professional organizations,

such as law and accounting firms, as well as pharmaceutical companies, also have enormous amounts of goodwill represented by their employee talent pool. These characteristics are inseparable from the firm and can only be measured after determining the fair value of each of the company's reporting units. After assigning the fair value of the identifiable assets and liabilities to a company's reporting units, any residual value is classified as goodwill [FASB, 2001a; Wen and Moehrle, 2016]. The costs of internally developed goodwill by a company must be expensed and may not be capitalized as an asset on the balance sheet. Goodwill may only be capitalized through the acquisition of an entity.

In general, an asset may not be reported on an entity's balance sheet at an amount that exceeds its fair market value. In other words, the carrying value of any asset, including goodwill, may not exceed its fair market value. Unlike most assets, such as accounts receivable and inventory, whose fair value can be objectively determined, goodwill can only be recognized in the acquisition of an entity. The following chronological review depicts the accounting profession's efforts in measuring this asset.

Post June 2001 to December 15, 2011, FASB 142 required an enterprise to at least annually measure the valuation of the goodwill asset using a "two step" procedure. The goodwill asset initially had to be identified to a "reporting unit," which is an operating segment of the company or a component where discrete financial information is available, and management routinely reviews its operations in accordance with SFAS 142 [FASB, 2001b]. Large public companies could potentially have hundreds of reporting units, which would entail significant complexity in identifying the location and the valuation of goodwill. Once the goodwill could be identified to each reporting unit, a "two-step" procedure was required as follows:

- (1) An entity is required to measure the fair value of each reporting unit and compare the result to its carrying value. Where the carrying value of the reporting unit exceeds the fair value, the goodwill asset is presumed to be impaired.
- (2) Failing to satisfy "Step 1" requires the entity to value all the identifiable assets and liabilities of each reporting unit, and to attribute any residual value to the goodwill asset. This procedure usually requires the services of various appraisal specialists. This second step attempts to value the reporting unit as if it were hypothetically purchased in a new business acquisition [FASB, 2001b].

Thus, the "two-step" test requires additional resources to value all the identifiable assets and liabilities and then "plug" any residual value to the goodwill asset. Companies such as Coca Cola Company and United Technologies Corporation generally use valuation methods such as the discounted cash flow model (DCF), also referred to as the "income approach" [Coca Cola Company, 2010]. Other companies, such as Verizon Communications Inc., use a "market approach," which uses com-

parative “multiples,” such as earnings and sales data, in determining the unit’s fair market value [Verizon Communications Inc., 2010].

However, nonpublic companies found this “two-step” procedure particularly onerous and costly. In addressing these concerns, the FASB through ASU, 2011-08, provides the “Step 0” option [FASB, 2011]. This option allows an entity to assess the potential impairment of goodwill using a list of suggested “qualitative” factors. Large international CPA firms, such as Ernst & Young LLP and Deloitte & Touche LLP provide detailed guidance in how to apply the provisions of this test [Ernst & Young LLP, 2011; Deloitte & Touche LLP, 2012]. Where an entity satisfies the “qualitative” assessment procedures, the conventional “two-step” test would not be required. In facilitating the potential cost savings for all enterprises, the FASB allows this “qualitative” assessment option not only for nonpublic companies but also for publicly listed companies.

Under the “qualitative” assessment approach, an enterprise has the option of using the following factors in determining the potential impairment of goodwill [FASB, 2011]:

- Macroeconomic conditions
- Industry and market considerations
- Cost factors
- Overall financial performance
- Other relevant entity-specific events
- Events affecting a reporting unit
- A substantial decrease in share price

After reviewing these “qualitative” factors, where a company determines it is “more likely than not” (greater than 50 percent probability) that the carrying value of the entity’s reported net assets does not exceed its fair market value, the entity may conclude that its goodwill asset is not impaired. If an entity fails the “Step 0” test, the costly “Step 1” and/or “Step 2” tests will be required. If an entity passes the “Step 0” test, the costly “two-step” process is avoided, resulting in significant cost savings. Recent studies have indicated a positive trend of companies adopting the “qualitative” assessment approach and reducing the costs of determining goodwill impairment [Duff and Phelps, 2015; Roland, Nunes and Todorova, 2014].

RESEARCH DESIGN AND METHODOLOGY

Our original research objective attempted to determine whether there was a significant decrease in the reported amount of goodwill impairment after the issuance of ASU, 2011-08 [FASB, 2011]. After collecting and analyzing the data, we realized that the focus of our original study missed more significant research opportunities. Our initial research was to compare the reporting of the goodwill

impairment for a random sample of publicly listed corporations for four reporting periods before and after the enactment of ASU, 2011-08 [FASB, 2011]. In determining the cost savings of the qualitative assessment option, we expected that there would be fewer companies reporting an impairment of the goodwill asset, as well as a decrease in the dollar amount of the impairment.

Upon reviewing a sample of the footnote disclosures, we realized that a superior research objective was to ascertain the number of companies that passed the “Step 0” test and secured the cost savings envisioned by the FASB. In determining which companies were “qualitative” assessment adopters under ASU, 2011-08 [FASB, 2011], an intensive review of some of the footnotes on goodwill impairment was completed.

After observing the diverse disclosures regarding the adoption of the “Step 0” option, we decided to conduct an initial test using the Dow 30 companies. The purpose was to uncover any difficulties and research limitations and to provide some guidance to refine our extended study in the following areas:

- (1) Research design
- (2) Data collection method
- (3) Data coding scheme
- (4) Data analysis procedures

In our initial study, we were expecting that after a passage of time, fewer companies would report the impairment of goodwill, as well as a decline in the dollar amount of the impairment. With this revised research objective, which is to observe the number of companies that passed the “Step 0” test, we completed an intensive review of each entity’s footnotes on goodwill impairment. We calculated the percentage of cost savings on accounting for goodwill impairment by dividing the number of firms that tested and passed the “Step 0” test over the population.

This initial study addresses the following research questions:

- (1) How do companies disclose the “Step 0” option in their annual financial reports?
- (2) How many companies have transitioned to the “qualitative” assessment approach since its introduction in 2011?

Theoretical Framework

Our original research objective was to determine the expected decrease in goodwill impairment due to the “qualitative” option available for U.S. Securities and Exchange Commission (SEC) registrants. However, the empirical data extracted from the companies’ financial statements and footnote disclosures did not provide adequate information to directly measure this metric. We therefore were compelled to modify our research objective to estimate the savings on accounting costs for goodwill impairment. We also cannot directly measure the savings by

adopting the “qualitative” option because accounting cost on goodwill impairment is not explicitly reported on the companies’ financial statements. We addressed this limitation by using a surrogate measurement. We counted the number of companies that successfully adopted the “qualitative” option. This allowed us to calculate the percentage in lieu of the actual amount of accounting costs for goodwill impairment.

We retrieved the annual reports of the Dow 30 companies either from the SEC’s New Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system or directly from the company’s official website. In reviewing the footnotes of these companies, we observed significant variations on the disclosure of the application of the “qualitative” assessment option. Disclosures related to the “qualitative” option were either clear and transparent or confusing and ambiguous. We designed the following coding scheme to collect and process the empirical data:

Clear disclosures:

- “Step 0” test was passed, and the company avoided the costly quantitative procedures of “Step 1” and/or “Step 2” (coded as C1).
- “Step 0” test was not passed, and the company was required to perform the costly quantitative procedures of “Step 1” and/or “Step 2” (coded as C2).
- “Step 0” test was bypassed, and the company performed the costly quantitative procedures of “Step 1” and/or “Step 2” (coded as C3).

Ambiguous and confusing disclosures:

- “Step 0” test was discussed, but the company failed to indicate whether “Step 0” was tested or not before applying the costly quantitative procedures of “Step 1” and/or “Step 2” (coded as A1).
- “Step 0” test was not discussed, and the entity applied the costly quantitative procedures of “Step 1” and/or “Step 2” (coded as A2).

Disclosures not required:

- The company had no goodwill (coded as N/A).

The following section provides some examples from our data collection:

The 2014 Goldman Sachs Group, Inc.’s footnote disclosure included the following: “The qualitative assessment required management to make judgments and to evaluate several factors, which included, but were not limited to, macroeconomic conditions . . . we determined that goodwill was not impaired and that a quantitative goodwill impairment test was not required” [The Goldman Sachs Group, Inc., 2014]. This indicated that for the fiscal year ended December 31, 2014, the company tested and passed the “Step 0” option. For companies that provided the same or similar clear disclosures, we coded the data points as “C1”. Below is a list of the companies that were coded as “C1”:

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- Boeing
 - Coca-Cola
 - Goldman Sachs
 - Home Depot
 - Intel
 - IBM
 - Nike
 - Visa
 - Walmart

The 2015 Merck & Co., Inc.'s footnote provided the following disclosure: "The Company tests its goodwill for impairment on at least an annual basis, or more frequently if impairment indications exist, by first assessing qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount" [Merck & Co., Inc., 2015]. This wording indicated that for the fiscal year ended December 31, 2015, the company elected the "Step 0" option. However, in reviewing the accompanying schedule, the company reported a goodwill impairment loss of \$47 million. This implied that one or more of its reporting units failed the "Step 0" test and the company was required to apply the "Step 1" and or "Step 2" procedures in calculating the impairment of goodwill. For companies that provided the same or similar clear disclosures, we coded the data points as "C2". For 2014, only Merck & Co., Inc was coded as "C2".

The 2014 3M Company's footnote disclosure provided the following: "Companies have the option to first assess qualitative factors to determine whether the fair value of a reporting unit is not more likely than not less than its carrying amount, which is commonly referred to as Step 0. 3M Company has chosen not to apply Step 0 for 2014 or prior." [3M Company, 2014]. This indicated that for the fiscal year ended December 31, 2014, the company chose not to take the "Step 0" option. For companies that provided the same or similar clear disclosures, we coded the data points as "C3". The following is a list of the companies that were coded as "C3":

- 3M
- United Health Group
- United Technologies
- Verizon

The 2014 Caterpillar Inc.'s footnote provided the following disclosure: "We have an option to make a qualitative assessment of a reporting unit's goodwill for impairment. If we choose to perform a qualitative assessment and determine the fair value more likely than not exceeds the carrying value, no further evaluation is necessary" [Caterpillar Inc., 2014]. Although this company discussed the "Step 0" option, there was no clear indication whether the test was performed. Any

company that provided the same or similar ambiguous disclosures were coded as “A1”. In this pilot study, only Caterpillar Inc. was coded as “A1”.

The 2015 Apple Inc.’s footnote disclosure provided the following: “The Company does not amortize goodwill and intangible assets with indefinite useful lives, rather such assets are required to be tested for impairment at least annually or sooner whenever events or changes in circumstances indicate that the assets may be impaired. The Company performs its goodwill and intangible asset impairment tests in the fourth quarter of each year. The Company did not recognize any impairment charges related to goodwill or indefinite lived intangible assets during 2015, 2014 and 2013” [Apple Inc., 2015]. There was no discussion regarding the “Step 0” option in any section of the company’s footnote disclosures or management discussion and analysis (MD&A). For companies that provided the same or similar ambiguous disclosures, we coded the data points as “A2”. The following is a list of the companies that were coded as “A2”:

- American Express
- Apple
- Chevron
- Cisco
- Disney
- DuPont
- GE
- Johnson & Johnson
- JP Morgan
- McDonalds
- Microsoft
- Pfizer
- Proctor & Gamble
- Travelers

The last category of our data was coded as “N/A” for companies that did not report any goodwill. In this pilot study, only Exxon Mobil Corporation was coded as “N/A” [Exxon Mobil Corporation, 2015].

Hypothesis

H1:

As time passes, more companies will adopt the “Step 0” option and avoid the costly quantitative procedures of “Step 1” and/or “Step 2” valuation process for goodwill impairment.

Study Design

Presumably, large cap companies have more available financial resources and accounting talent for taking advantage of new accounting rules and regulations. Thus, to refine the research design for our extended study, we used the Dow 30 companies to test the validity and reliability in every aspect of our research design and methodology.

In this longitudinal study, footnote disclosures and management discussion and analysis (MD&A) on accounting for goodwill are extracted from the annual reports of the Dow 30 companies. These annual reports are published in the SEC's New EDGAR system, or on the companies' websites.² After analyzing the data, we coded each footnote disclosure in conformity with the coding scheme discussed earlier.

Variables and Measures

As discussed in the previous section, there is no direct method to measure a firm's annual cost savings on accounting for goodwill because these costs are not itemized on the financial statements. We borrowed an approach used in marketing research, where abstract constructs are measured by using observable dimensions. For example, to measure the degree of thirst of an individual, we may count the number of cans of Coke or glasses of water that a person ingests in ten minutes [Price and Mueller, 1986; Sekaran and Bougie, 2013]. We operationalized the total annual cost savings on accounting for goodwill for the Dow 30 companies as a group by counting and comparing the number of companies that passed the "Step 0" test. We then used the following formula to scientifically estimate the percentage of the savings on accounting costs for goodwill impairment:

$$Y_n = X_n / 29 \quad (1)$$

The dependent variable, Y_n , is the percentage of the savings on the accounting costs on goodwill for the Dow 30 companies as a group for each applicable year. The independent variable, X_n , is the number of companies that passed the "Step 0" test for the Dow 30 companies as a group for each applicable year. The denominator is the total number of companies included in this study.³

Data and Data Collection Method

In examining each company's annual report, we applied a keyword search of "qualitative," "goodwill," and "impairment" to identify all relevant references in

²In instances, we acquired the necessary information by directly retrieving the annual reports from the company's website because it was not reported in the SEC's New EDGAR system.

³We used 29 companies in lieu of 30 companies because Exxon Mobil Corporation did not report goodwill for each year in our study.

Table 1. Summary of “Step 0” Disclosures

Code	Year										Grand Total	
	2011		2012		2013		2014		2015			
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
A1	2	6.9	3	10.34	3	10.34	1	3.45	1	3.45	10	6.9
A2	20	68.97	16	55.17	15	51.73	14	48.28	15	51.72	80	55.17
C1	3	10.34	7	24.14	8	27.59	9	31.03	8	27.59	35	24.14
C2	1	3.45	1	3.45	0	0	1	3.45	2	6.9	5	3.45
C3	3	10.34	2	6.9	3	10.34	4	13.79	3	10.34	15	10.34
Subtotal	29	100	29	100	29	100	29	100	29	100	145	100
N/A	1		1		1		1		1		5	
Total	30		30		30		30		30		150	

the company’s footnotes and the Management’s Discussion and Analysis of Financial Condition and Results of Operations (MD&A). In reviewing and analyzing this information regarding the disclosures of the “qualitative” assessment option for testing goodwill impairment, we coded and recorded each data point as discussed in the theoretical framework section. Table 1 summarizes the distribution of our data.

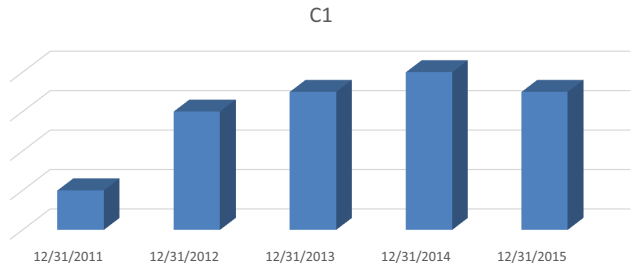
DATA ANALYSIS AND RESULTS

After examining each of the footnote disclosures and MD&A on accounting for goodwill, we assigned an appropriate category or code (see coding scheme in the Theoretical Framework section). Refer to the summary of the results reported in Table 1.

Applying the results of Table 1 for each applicable year, we can estimate the percentage of cost savings on accounting for goodwill impairment for reporting years 2011 through 2015. For 2011, the cost savings are 10.34 percent ($Y_{2011} = 3/29$). For 2012, the cost savings are 24.14 percent ($Y_{2012} = 7/29$). For 2013, the cost savings are 27.59 percent ($Y_{2013} = 8/29$) and for 2014, the cost savings are 31.03 percent, ($Y_{2014} = 9/29$). For 2015, the cost savings are 27.59 percent ($Y_{2015} = 8/29$).

After capturing the annual cost savings of goodwill accounting for the Dow 30 companies, we also examined the trend of the “Step 0” adopters. Referring to Table 1, we summarized the disclosures for the reporting years from 2011 through 2015. In general, 6.90 percent of the Dow 30 companies discussed the “Step 0” test, but failed to indicate whether “Step 0” was tested or not before applying the costly quantitative procedures of “Step 1” and/or “Step 2”. In addition, 55.17 percent of the Dow 30 companies did not discuss the “qualitative” assessment option at all, and these entities applied the costly quantitative procedures of “Step 1” and/or “Step 2”. The results indicate that the majority of the Dow 30 companies, 62.07 percent (6.90 percent + 55.17 percent), failed to indicate whether they applied the “Step 0” option.

Figure 1. Annual Total of Companies Passing the “Qualitative” Assessment



For the clear disclosure group, 24.17 percent of the Dow 30 companies reported that the “Step 0” test was passed and the company avoided the costly quantitative procedures of “Step 1” and/or “Step 2”. The “Step 0” test was not passed by 3.45 percent of the Dow 30 companies, which were required to perform the costly quantitative procedures of “Step 1” and/or “Step 2”. The “Step 0” test was bypassed by 10.34 percent of the Dow 30 companies, which were required to performed the costly quantitative procedures of “Step 1” and/or “Step 2”. In summary, 27.59 percent (24.14 percent + 3.45 percent) of the Dow 30 companies tested the “Step 0” option. We used 29 as our denominator in lieu of 30 to compute the aforementioned percentages because Exxon Mobil Corporation did not report goodwill in any of the fiscal years included in the study. We coded its disclosure as “N/A” in Table 1. We also provide a visual overview of the trend in adopting “Step 0” in a bar graph in Figure 1.

DISCUSSION OF RESULTS

The results of the study indicate that companies are achieving cost savings by adopting the “qualitative” assessment approach. In addition, Table 1 demonstrates that three companies, or 10.34 percent, of the Dow 30 group tested and passed the “qualitative” assessment in the transitional year of 2011. Seven companies, or 24.14 percent, tested and passed the “qualitative” assessment in 2012. Eight companies, or 27.59 percent, tested and passed the “qualitative” assessment in 2013, and nine companies, or 31.03 percent, tested and passed the “qualitative” assessment in 2014. Eight companies, or 27.59 percent, tested and passed the “qualitative” assessment in 2015. In general, the results suggest that the majority, or 75.86 percent, of the Dow 30 companies failed to benefit from the cost savings provided by ASU, 2011-08. Therefore, only 24.14 percent of the Dow 30 companies realized the cost savings provided by ASU, 2011-08. However, as depicted in Figure 1, there is a positive trend of “Step 0” adopters from the transitional year of 2011 to subsequent years through 2015, with the exception of a slight decline in the final year of the study. Thus, the alternative hypothesis that

as time passes, more companies will adopt the “Step 0” option and avoid the costly quantitative procedures of “Step 1” and/or “Step 2” valuation process for goodwill is supported.

Although there were fewer companies that elected the “Step 0” option in the earlier years, this may be attributed to the recession and downturn in the economy. Many companies may have expected to fail the “step 0” option and therefore decided not to use it. As the economy recovers, we anticipate an increase in the number of companies that will elect to apply the “Step 0” option.

CONCLUSIONS

As discussed, goodwill is the most complex asset to evaluate because it consists of various economic resources, such as the talent pool of a company’s employees and the loyalty of the entity’s customers. Goodwill represents a “bundle” of resources that cannot be separated from the going concern of the company. Consequently, it may only be reliably measured when an entity is purchased through a business acquisition. Goodwill represents the consideration that the acquirer is willing to pay in excess of the fair value of the company’s identifiable assets and liabilities. One of the bedrocks of our conceptual framework requires that firms report “relevant” information. The impairment of any asset, including goodwill, must be recognized. Educators will need to teach their students of our profession’s attempt to simplify goodwill accounting. Students will need to be informed that these alternative procedures may not be clearly reported or even used by filers. This empirical study demonstrates that there is often a gap between the availability of an accounting standard and the disclosures reported by the SEC filers.

Our study revealed that the majority (75.86 percent) of the Dow 30 companies failed to take advantage of the “qualitative” assessment option. In addition, many companies did not provide clear disclosure regarding the adoption of ASU, 2011-08. The empirical results of this study indicated that companies were achieving cost savings by adopting the “Step 0” assessment approach. In addition, the study suggested a positive trend of adopters from the transitional year of 2011 to subsequent years through 2014.

Our primary motivation for this initial study was to provide evidence on the ability and willingness of firms to choose the “Step 0” option and realize cost savings on goodwill accounting. Although the Dow 30 companies represent a small sample, we selected these companies in anticipation that they would have the most comprehensive disclosures regarding ASU, 2011-08, because they would have adequate financial resources and sophisticated accounting professionals. Our future study will comprise a representative sample of all the companies registered with the Securities Exchange Commission. We also plan to improve the research methodology employed in this pilot study and apply it to our extended study.

ACKNOWLEDGMENTS

We thank Ms. Mingzhu Liu for her invaluable assistance in this project.

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A “Grey Zone” in Teaching Variance Analysis Survey Evidence in Accounting and Finance

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One tool for analyzing operational performance is accounting variance analysis. In corporations, variance analysis is part of Financial Planning and Analysis [FP&A]. Its domain is less apparent in academia. We survey academics and practitioners about this tool. More than 90 percent of business professionals surveyed use accounting variance in some form, typically for analyzing deviations in a company’s actual results versus the firm’s forecast. This is an area that universities can emphasize to improve alignment with the skills that modern employers are looking for in graduates and improve cross-disciplinary education. We offer suggestions on how to achieve these goals.

Keywords: Variance Analysis, Financial Planning and Analysis, Budgeting

Disciplines of Interest: Corporate Finance

INTRODUCTION

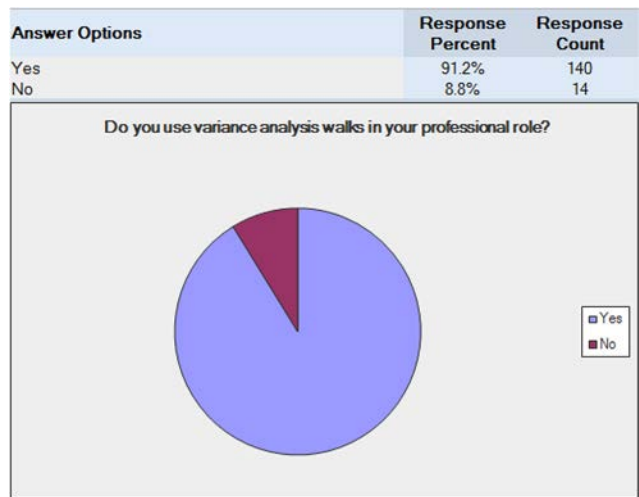
A major argument in the academic pedagogy literature focuses on the degree to which the business curriculum should be separated into distinct silos or integrated. Campbell, Heriot, and Finney [2006], for instance, argue that specialized depth in courses plays an important role in business training despite the need for multidisciplinary projects within each specialized course. Navarro [2008] argues that despite efforts at cross-disciplinary training, Master of Business Administration (MBA) programs largely provide a homogenous product lacking in differentiation *vis-a-vis* thematic elements like branding and lacking important experiential components.

From the extant pedagogical literature, it is clear that while there is limited consensus about the need for cross-disciplinary education, there is also profound

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Figure 1. Use of Variance Analysis by Corporate Finance Professionals



disagreement about what elements of business are important to a sound business education and whether those elements should differ between different universities. Laster and Russ [2010] survey instructors at a broad swath of business schools and call for cross-disciplinary uniformity in business education. Similarly, Freeman [2008] explores how cross-disciplinary training in MBAs can improve educational outcomes.

We waded into this debate by pointing out an important and sometimes overlooked area of finance and accounting—variance analysis. Variance analysis includes analyzing bar charts showing differences or variances between profit, sales, or margin over time against a corporate forecast. These charts are sometimes referred to as “walk,” “bridge,” “waterfall,” and/or “floating bar” charts. Examples of corporate use of such charts and the associated analysis are provided in Appendix 1. Despite the prevalence of variance analysis in many corporate finance functions, the area is more often taught by accounting professors. This juxtaposition of educational home versus professional home results in what we label a “grey zone”—an area primarily used by one discipline in practice but primarily taught by another.

It is possible that business schools may be able to avoid grey zones like the one examined here by using a cross-disciplinary approach to corporate finance and accounting, involving greater collaboration between faculties in different departments. The variance analysis tool examined here plays an important role in industry, as evidenced by the fact that more than 90 percent of corporate finance professionals surveyed by Conine and McDonald [2017] use the variance analysis tool, as shown in Figure 1, below. As part of a separate survey on industry

participants, we talked to Donald Allan, the chief financial officer (CFO) of industrial company Stanley Black & Decker. He said “One of the most important elements to drive agility in today’s dynamic business environment is the ability to execute operating performance commitments within a particular planning period despite changes in business conditions. At Stanley Black & Decker, we place a heavy emphasis on the development of a robust set of business drivers that provide a strong foundation for reality-based performance expectations. These drivers are developed using internal and external factors relative to the business segments that we participate in and complemented by a variance analysis process that continuously evaluates our performance vs. these drivers. This is one of the most critical value-added activities led by the Finance team to effectively track performance and, importantly, make adjustments as necessary to stay on track to deliver our financial commitments.” Unfortunately, this area of business is overlooked, perhaps because of a lack of cross-disciplinary collaboration.

Variance analysis is a tool that is widely used in corporate finance roles in analyzing variances on pricing, operational cost, sales, and profitability at firm and department levels. An illustration of the importance of variance analysis comes from Mark Guinan, the chief financial officer (CFO) of Quest Diagnostics, who told us, “Variance analysis is a fundamental tool for business decision-making. Whether it is comparing performance to budget or to the prior year, it is the best way to understand the robustness of your ability to forecast, as well as how well controlled your key business processes are. Using high-level BVA [Budget Variance Analysis] tools enables the organization to understand emerging deviations and point one’s resources towards the key risks and opportunities as quickly as possible.”

Hansen, Otley, and van der Stede [2003] point out the practicality and use in industry budgeting of variance analysis. The tool is often taught in corporate entry-level accounting and finance programs because of its usefulness in evaluating standard cost-volume-profit relationships and the degree of operating leverage. These variances are commonly used not only in internal corporate documents but also in documents geared towards investors, such as quarterly investor relations presentations from publicly traded firms. As Balkrishnan and Sprinkle [2003] show, variance analysis can be used as part of a framework to improve managerial information and decision making. In light of the importance of variance analysis to other areas of finance and accounting, the topic would seem to fit well with the business process approach towards education advocated by Walker and Ainsworth [2001], among others.

Conine [2013] introduced the idea of a “grey zone” between accounting and finance related to the various curriculums that teach variance analysis. That work showed a widespread lack of attention to variance analysis in finance texts and courses. Many finance professors viewed variance analysis

as an accounting function. This leaves open the question of how accounting professors view variance analysis and the degree to which they are teaching what is traditionally a skill used most commonly in corporate finance functions. Given the operational importance of variance analysis for many graduating finance majors, the subject matter needs to be covered for students at some point in the business curriculum.

Interestingly, variance analysis in a meeting-commitments framework is typically a fundamental pedagogy in the financial and accounting entry-level training programs of numerous global corporations. Fowler [2011] and Fowler, Tan, and Hawkes [2004] show survey evidence that clearly demonstrates that accounting variance analysis ranks consistently higher in importance to practitioners than to educators, and that its practical importance has increased between 2001 and 2010. These findings are consistent with the research by Adler, Everett, and Waldron [2000]. Overall, of 21 significant managerial accounting techniques, practitioners rank variance analysis as 3rd to 4th most important, while educators rank the tool at 10th to 13th most important, according to Fowler's findings in 2001 and 2010.

One of the largest finance career opportunities in modern America with major companies is in the financial planning and analysis (FP&A) area. Variance analysis is a crucial part of FP&A in numerous companies. Chenhall and Langfield-Smith [1998, 1999] show that 95 percent of firms use variance analysis for business control purposes. Yet, despite its use in the finance domain in corporate settings, there seems to be an implicit expectation among finance educators that it be taught in the accounting discipline [Conine, 2013]. This may be due to the fact that, historically, variance analysis research has primarily been a topic among accounting researchers. The surveys done for this paper suggest that this domain needs to be expanded beyond accounting. Understanding variances can enhance a firm's competitive advantage, improve risk management, and increase the probability of meeting commitments. All of these outcomes could plausibly create shareholder value. For a practitioner's arguments supporting the value of variance analysis see Putra [2009]. Aruomoghe and Agbo [2013] provide a thorough analysis of the uses of variance analysis in practice.

Conine [2013] found that only 59 percent of finance faculty members were familiar with the concepts of accounting variance analysis, yet 71 percent recognized the criticality of accounting variance analysis to their finance major's career in their next three to five years. In the survey summary, Conine [2013] stated "Survey responses indicate that a Grey Zone may exist between finance and accounting as to the teaching of variance analysis." To the best of our knowledge, there are no other surveys on the teaching of variance analysis. This paper presents the results of a survey of accounting educators and adds additional context to the work of Conine [2013] with finance educators.

Table 1. Results of Faculty Survey on Teaching Variance Analysis

Question	Faculty	
	Finance	Accounting
In what type of course do you teach variance analysis?	Managerial Finance, Financial Controls, Management Control Systems, Corporate Finance (CVP Analysis, Financial Modeling), Managerial Accounting, Venture Capital, Corporate Restructuring, Financial Reporting & Analysis, and Finance for Managers	Cost Accounting, Management Control Systems, Managerial Accounting
What methods do you use to teach variance analysis?	Lectures, cases, readings, simulations, Excel modeling	Lectures, cases, problem sets

CVP, cost-volume-profit.

SURVEY METHODOLOGY AND RESULTS

The accounting faculty survey consists of 95 survey responses from 72 different schools around the world.¹ These results were combined with a previous survey of finance faculty from Conine [2013]. The two surveys used were the same, except where additional questions were added to the accounting survey based on the initial findings of Conine [2013]. Of the schools in the sample, most were large public (state) universities—approximately 60 percent (58 responses). Large private universities accounted for roughly 25 percent of the sample (23 responses), with small private universities representing 5 percent (5 responses), and foreign universities (United Kingdom and Australia) represented just under 10 percent of responses (9 responses). A third-party online survey service was used to handle all surveying and compiling of responses.

Table 1 shows the responses to where and how finance and accounting faculty teach variance analysis. This table illustrates the range of areas where variance analysis is taught and the inconsistency compared to a tool like weighted average cost of capital, which is consistently taught starting in intermediate level finance classes.

It would appear that accounting variance analysis is restricted to fewer courses in an accounting curriculum than in a finance curriculum. While a simple count of classes where material is taught belies the reality that teaching is more

¹Survey is found in Appendix 2.

Figure 2. Sample Operating Margin Variance Walk Chart



than just repeatedly presenting material in a class, the class count does offer a proxy on where material is being presented, and that proxy suggests it is in the accounting realm, rather than in finance. That result is logical, given the practical application of the subject matter by financial users. The use of problem sets to teach variance analysis in an accounting curriculum appears to be standard pedagogy. However, the course material being taught in accounting does not always reflect the manner in which FP&A practitioners use variance analysis. In practice, variance analysis is often used for forecasting purposes, whereas in accounting, the tool may be seen as more backward looking. In fact, there appears to be substantial variation in how and where variance analysis is taught between different universities. The wide array of courses in finance that examine variance analysis in some context leads to less standardization of the material compared with that in accounting. Yet, as Figure 2 below reveals, despite the fact that more types of finance courses are teaching variance analysis, a much smaller proportion of finance professors teach variance analysis compared with accounting educators.

It is noteworthy that despite the widespread use of variance analysis in corporate finance careers, almost one-third of finance professors do not feel the subject matter is worthwhile for finance majors. By contrast, roughly 95 percent of accounting professors see the subject as useful.

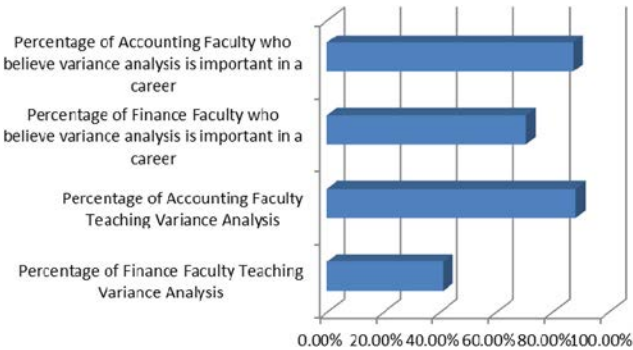
In Table 2, we show the survey results for familiarity with the operating margin variance graphic used in both the Conine [2013] survey and this survey. A sample operating margin variance walk chart as used in the survey is shown in Figure 3. Understanding of this type of graphic is critical to understanding variance analysis, as the “walk chart” shown here is typical of the type of corporate presentation that amplifies variance analysis. Appendix

Table 2. Results of Faculty Survey on Familiarity with Variance Walks

		Are you familiar with the enclosed graphics, often referred to as floating bars, brick charts, or, more commonly, variance walks?					
		Finance faculty			Accounting faculty		
		Yes	No	Total	Yes	No	Total
Would your students be familiar with these graphics?	Yes	19 (37.2%)	3 (5.9%)	22 (43.1%)	25 (30.1%)	1 (1.2%)	26 (31.3%)
	No	11 (21.6%)	18 (35.3%)	29 (56.9%)	15 (18.1%)	42 (50.6%)	57 (68.7%)
	Total	30 (58.8%)	21 (41.2%)	51 (100%)	40 (48.2%)	43 (51.8%)	83 (100%) ^a

^aA total of 83 of 95 respondents—the remaining 12 respondents had a combination of other replies beyond yes and no.

Figure 3. Faculty Usage and Perceived Relevance of Accounting Variance Analysis

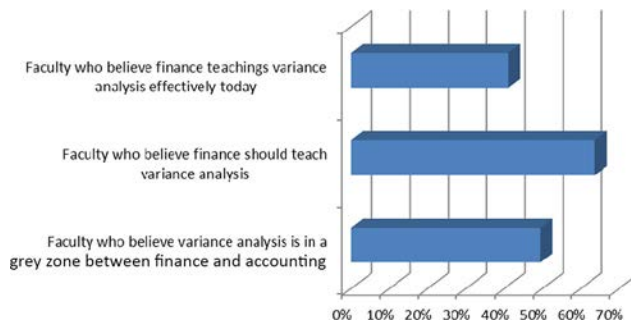


1 illustrates a number of examples of this type of chart taken from actual corporate presentations.²

The binary categorical values (i.e. yes or no responses) indicate that faculty familiarity with the material in question leads to student familiarity with the material. In Table 2, the source of a possible “grey zone” for variance analysis may result from differing levels of familiarity with variance analysis. While accounting courses are far more likely to cover variance analysis (see Figure 2 above), Table 2 shows that only about half of accounting faculty are familiar with variance analysis-type graphics used by corporate financial professionals, such as those shown in Figure 3 (see Aruomoaghe and Agbo [2013] for a discussion of contemporary variance analysis in practice). By contrast, almost 60 percent of finance faculty are familiar with the graphics. Similarly, more finance faculty (43.1 percent) than accounting faculty (31.3 percent) felt that students would be

²The survey used binary categorical variables rather than a continuum of categorical variables, largely to avoid subjective decisions around interpretation. For example, it might be difficult to interpret the meaning of a 6 versus an 8 for a respondent saying they are familiar with variance analysis.

Figure 4. Faculty Placement of Variance Analysis into Discipline



familiar with variance graphs. This dichotomy highlights the basic disparity that results in a grey zone; accounting faculty are being asked to teach material that they are less familiar with to students, while the finance faculty who are familiar with the material are less likely to teach it. Even the common term—accounting variance analysis—implies that the tool is an accounting tool, although it is more often used in finance in practice, as shown by Aruomoaghe and Agbo [2013]. Despite 95 percent of firms using variance analysis in their corporate finance roles [Chenhall and Langfield-Smith [1998, 1999], only about one-third of students are estimated to be familiar with the material and are taught by a professor who is also familiar with it (37.2 percent in the finance faculty survey and 30.1 percent in the accounting faculty survey).

The resulting grey area that variance analysis occupies was the primary motivation for adding additional questions to the accounting survey over the finance survey used in Conine [2013].

Figure 4 shows that 50 percent of accounting faculty agreed that accounting variance analysis could fall into both the domains of accounting and finance. An even greater percentage (64 percent) felt that finance curricula should include some aspect of accounting variance analysis. Yet only 41.1 percent of accounting faculty felt that the finance curriculum did indeed include some variance analysis. The overall implication of Figure 4 is that the academic profession should attempt to engender greater communication between accounting and finance faculty regarding topical coverage in courses. This is consistent with past research done by Crittenden [2005]. One approach to this problem might be to provide syllabi from prerequisite courses to professors teaching followup courses to provide greater clarity around where various topics are being covered. An additional option could be to have complimentary departments like accounting and finance meet and mutually agree on which topics would be covered in which courses throughout a student's career. This level of

communication could help to ensure that students received the training they need in crucial areas like variance analysis.

CONCLUSIONS

All surveys have well-known positives and negatives, and of course a small survey can have significant biases. Nonetheless, from a pedagogical standpoint, the issues noted here do represent a significant concern, especially given the ongoing challenges to higher education as a whole. Given this issue, a number of suggestions are germane in this context.

- (1) Where practical, faculty in both accounting and finance should try to link cost-variance-price analysis, degree of leverage analysis, and accounting variance analysis to the courses they teach. Corporate finance texts in particular tend to be devoid of this material, which presents a challenge for many professors, but one that should not be avoided given the importance of the subject matter. For instance, a review of the appendix of *Fundamentals of Financial Management* [Brigham and Houston, 2014] shows no mention of variance analysis or any of the related terms, despite the popularity of the text. Reviews of *Fundamentals of Corporate Finance* [Ross, Westerfield, and Jordan, 2003] and *Corporate Finance, an Introduction* [Welch, 2009] shows a similar lack of material.
- (2) Faculty teaching case study classes in particular should consider adding a case devoted specifically to using the tools of variance analysis, if they do not already have such a case in their course. These tools will serve many students well in future corporate finance roles.
- (3) Faculty should consider incorporating the variance analysis used in many investor relations pitches into their courses. This is a great way to highlight a “real-world” application of a tool students should learn. Hansen, Otley, and van der Stede [2003] offer an excellent overview of how the tool is used in practice.
- (4) Accounting and finance faculty should seek each other out and talk about how and where variance analysis is being taught. Cross-disciplinary collaboration is critical to making sure that students are taught variance analysis from at least one perspective in either finance or accounting. A better approach would be to teach the tool from both perspectives in finance and accounting, but again, this requires cross-disciplinary collaboration to effectively accomplish.
- (5) Both accounting and finance faculty should stress the operational use of variance analysis, albeit from different perspectives. Variance analysis can be used in discussions of pricing, managing the supply chain, manufacturing costs, inflation/deflation around cost inputs, and risk management. These discussions can help students understand tradeoffs and the need to balance short-term and long-term goals in business.

Of course these suggestions are not mutually exclusive or exhaustive, and individual faculty members can certainly contribute their own unique perspectives on the topic. The goal of this note has been to explore how finance and accounting faculty view variance analysis, but it would be remiss to suggest that this completes the discussion of this important topic. Variance analysis is a powerful tool for students to learn, and a lot remains to be done in terms of understanding the best pedagogical techniques to help students learn the subject matter.

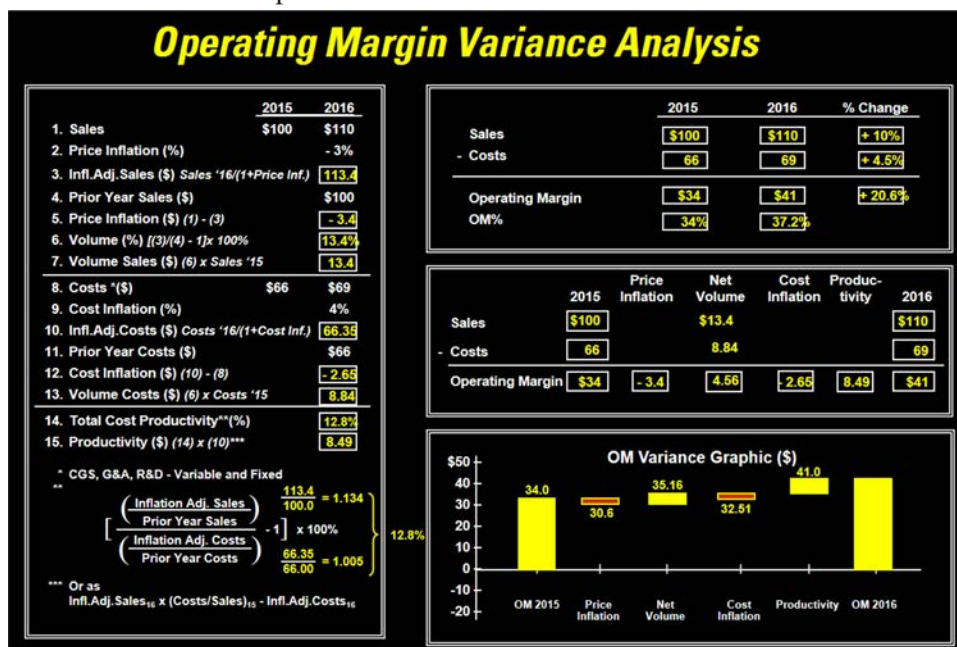
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APPENDIX 1: EXAMPLES OF VARIANCE ANALYSIS

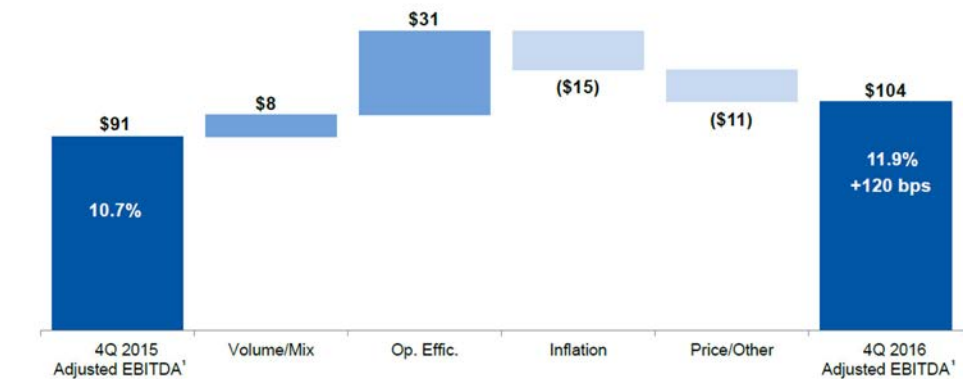
1 – Generic Example of Variance Buckets



2 – Cooper Standard IR Presentation with Variance Buckets (note similarity to 1)– Generic Example)

Quarter-Over-Quarter Adjusted EBITDA Bridge

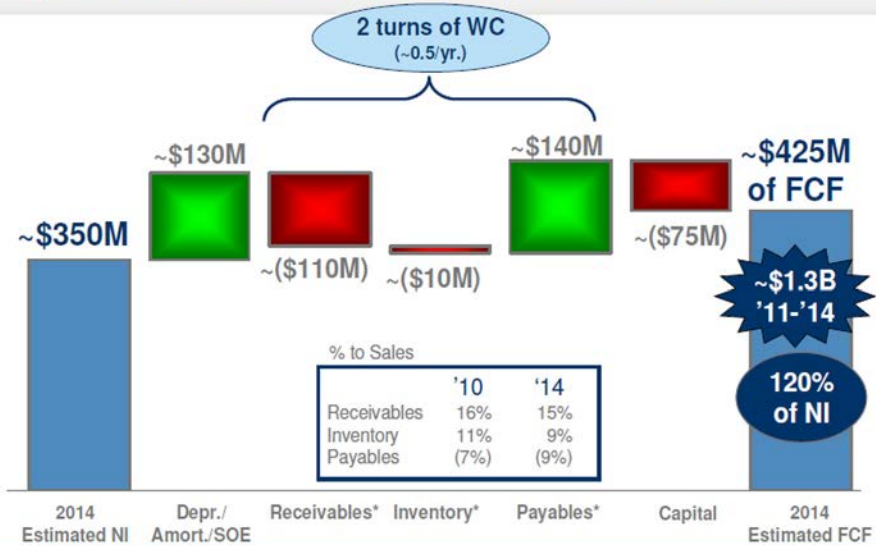
(USD millions)



¹ Adjusted EBITDA is a non-GAAP measure. See reconciliation in this appendix.

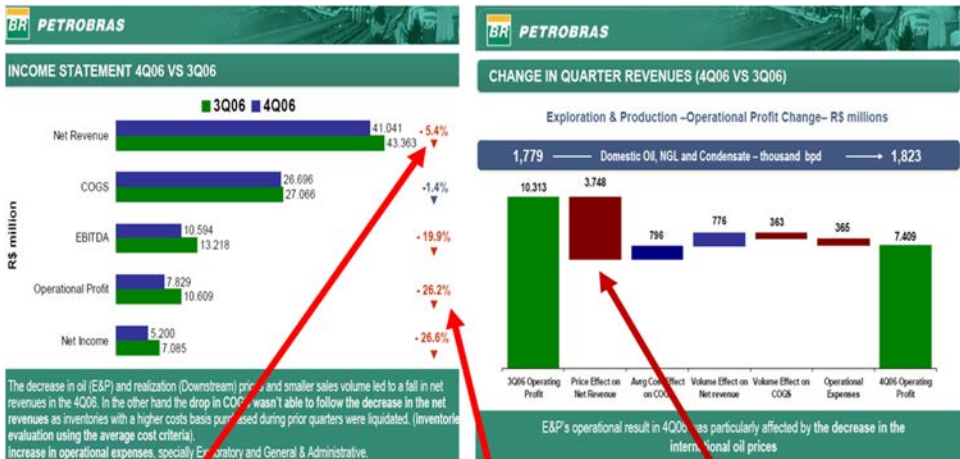
3 – Pentair Cash Flow Variances

2014 Cash Flow Generation Potential



“ Significant Cash Generation Potential; NI + Working Capital ”

4 – Petrobras KPIs and Variance Walk with Price Variance Linkage



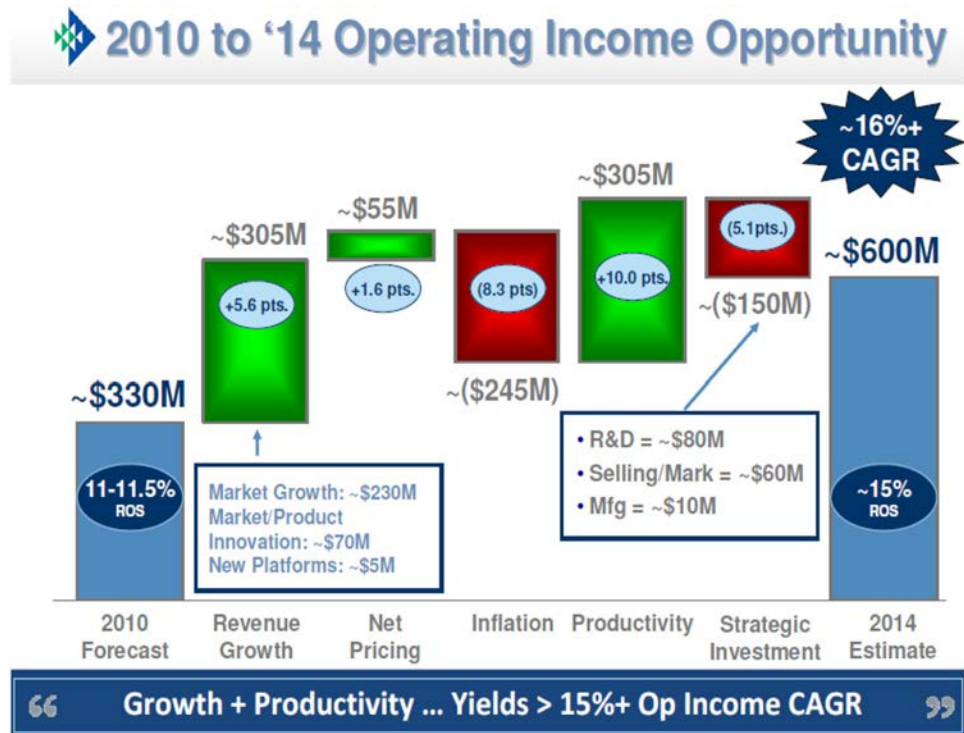
Net Rev is Off 5.4% while Operating Profit is Down 26 % ... Note the Impact of Negative Price on Walk

5 – Generic 3 Up Variance Walk . . . Look for Risk in Planning Not Post

2017 “OM” Variance Analysis – Risk Perspective							
Variances (\$000s)							
		Planning	Meeting Commitments		Growth	Comments on Plan to Actual	
OM	2016 Actual	100	2017 Plan	110	2016 Actual	100	
+Σ	Price*	2	+	-1	= *	1	Competitive pressure...failed to lock in forward price contract
	Volume*	4	+	-6	= *	-2	Lost anticipated national account
	Cost*	2	+	4	= *	6	E-Buy auction process expedited
	Productivity*	1	+	-1	= *	0	Driver strike in Q3
	Mix*	0	+	1	= *	1	Remote Diagnostics Service offered in Q4 ahead of schedule
	FX*	1	+	-1	= *	0	EURO did not strengthen
= OM	2017 Plan	110	2017 Actual	106	2017 Actual	106	
* This is an approximation to technically correct on the summation							

Where Do We Look for the Risk ?

6 – Pentair Pro Forma Operating Income Walk (note variance similarity to generic in 1) . . . Can you see any points of risk in plan?



7 – BHP Billiton Uncontrollable (external) and Controllable Variances Group EBITDA waterfall



APPENDIX 2: SURVEY

Survey of Pedagogical Applications of Variance Analysis

The purpose of this brief survey is twofold:

- 1) To find out whether you teach variance analysis, and
- 2) To better understand your perspective on its importance in the profession.

Variance analysis, in the context herein, is defined as prior year to plan, plan to actual and/or prior year to actual with regard to financial metrics, most likely operating profit. In a typical variance analysis, often found in a business review, operating profit is decomposed into price, volume, mix, cost, productivity, and foreign exchange.

In practice, variance analysis is typically part of a corporation's business reviews on a monthly, quarterly and/or annual basis. It would be routinely done by the FP&A corporate staff (Financial, Planning and Analysis).

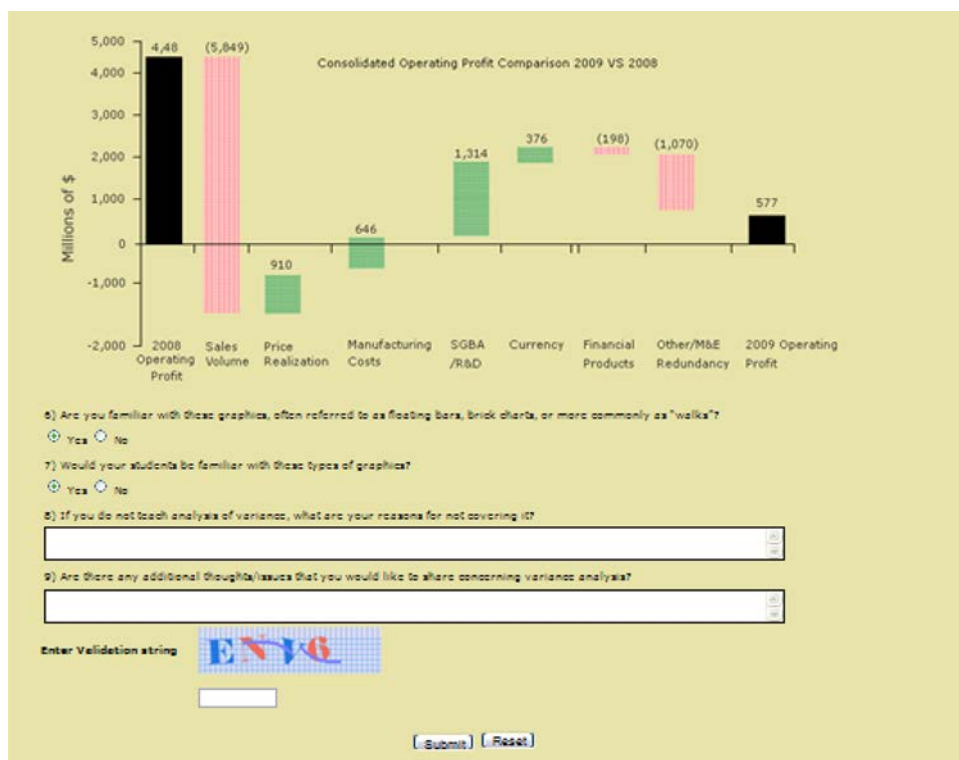
See a sample FP&A year over year variance below. I will gladly send you, upon request, the theoretical structure and some teaching examples if you complete the survey.



Thank You!

Tom Conine
tconine@fairfield.edu
Professor of Finance
Fairfield University
Fairfield, Connecticut, (USA)

Click here to complete the survey



Survey of Accounting Faculty Regarding Pedagogical Applications of Variance Analysis for Finance Majors

The purpose of this brief survey is threefold:

- 1) To find out whether you teach variance analysis, and
- 2) To better understand your perspective on its relevance to finance majors in your classes.

Variance analysis, in the context herein, is defined as prior year to plan, plan to actual and/or prior year to actual with regard to financial metrics, most likely operating profit. In a typical variance analysis, often found in a business review, operating profit is decomposed into price, volume, mix, cost, productivity, and foreign exchange.

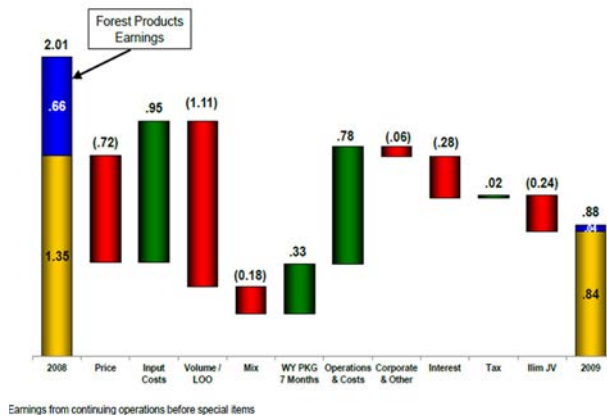
In practice, variance analysis is typically part of a corporation's business reviews on a monthly, quarterly and/or annual basis. It would be routinely done by the FP&A corporate staff (financial, planning and analysis).

See a sample FP&A year over year variance below. I will gladly send you, upon request, the theoretical structure and some teaching examples if you complete the survey.

2009 Earnings per Share

Weak Demand, Input Cost Relief, Strong Operations

INTERNATIONAL PAPER



Question Form:-

Please take a few minutes to complete the following questions. All responses are confidential. We will provide each respondent with the results once the study is completed. If you complete the survey, I will gladly, upon request, email you the theoretical structure of variance analysis as well as some simple numerical examples.

1) Do you teach accounting variance analysis in any of your courses?

___Yes

___No

2) In what type of course (e.g. financial accounting, cost accounting, management accounting, etc.) do you teach accounting variance analysis? At which levels (e.g. undergraduate, graduate, executive/corporate) do you teach accounting variance analysis?

3) What methods/tools do you use to teach accounting variance analysis (e.g. lecture material, case study, simulation, other)?

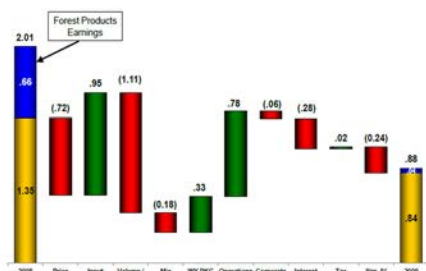
4) Do you feel the topic of variance analysis is worthwhile to a Finance Major's career over the first 3 to 5 years? Why or Why not?

5) Taking into account its real world applicability, where should accounting variance analysis be taught in a business school's curriculum?

For Questions 6 and 7, please consider the following graphics:

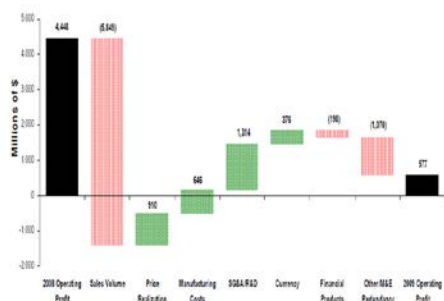
2009 Earnings per Share

Weak Demand, Input Cost Relief, Strong Operations



Consolidated Operating Profit Comparison

2009 vs 2008



6) Are you familiar with these graphics, often referred to as floating bars, brick charts, or more commonly as “walks”?

__Yes

__No

7) Would finance majors in your school be familiar with these types of graphics?

__Yes

__No

8) Would your accounting majors in your school be familiar with these types of graphics?

__Yes

__No

9) If you do not teach analysis of variance, what are your reasons for not covering it?

10) Do you feel the teaching of accounting variance analysis could fall into a “grey area” (between accounting and finance) in Business school curriculums as presented within?

__Yes

__No

11) Should the finance curriculum in your school also include the teaching of accounting variance analysis?

12) To the best of your knowledge, does the finance curriculum include accounting variance analysis?

__Yes

__No

12) Are there any additional thoughts/issues that you would like to share concerning variance accounting analysis?

Lone Wolf Tendencies and Perceived Value and Satisfaction with Team Projects: A Study of Business Students Majoring in Accounting and Marketing

Konrad Gunderson and Vivek Madupu

Steven L. Craig School of Business, Missouri Western State University; Austin E. Cofrin School of Business, University of Wisconsin-Green Bay

This study investigates the perceived value and satisfaction that students derive from team projects and the effect of lone-wolf tendencies on perceived value and satisfaction. Results reveal a significant negative correlation between lone-wolf tendencies and perceived value and satisfaction. We also address the issue of whether student major (i.e., accounting, marketing) can be used as a heuristic for identifying students with lone-wolf tendencies. Among the traditional business majors, accounting and marketing are considered opposites in personality, and accountants in particular are stereotyped as having lone-wolf traits. However, our results reveal that accounting and marketing students do not differ significantly on lone-wolf tendencies.

Keywords: Lone-Wolf Tendencies, Team Projects, Accounting, Marketing, Students

Disciplines of Interest: Accounting, Marketing, All Business Disciplines

INTRODUCTION

The popularity of team projects in business schools is well documented in the literature [Barr, Dixon, and Gassenheimer, 2005; McCorkle, Reardon, Alexander, Kling, Harris, and Iyer, 1999; Pragman, Bowyer, and Flannery, 2010], and many papers that deal with design and implementation of team projects have been published. However, few scholars have focused on personal characteristics that could have an impact on team projects. One such individual characteristic that has

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not drawn significant attention from scholars is students' lone-wolf tendencies and their relationship with team projects.

The study investigates the lone-wolf tendency and its relationship to student satisfaction and feelings of value derived from team projects. We hypothesize and find that students with lone-wolf personalities experience less satisfaction and perceived value from having participated in team projects. For business instructors, knowing that certain students are predisposed to disliking team projects is useful from a pedagogical standpoint. For example, this information could be used in assigning students to teams in a satisfactory way.

We also supplement the existing literature by investigating whether there are differences in lone-wolf tendencies among accounting and marketing students. Popular beliefs stereotype students majoring in accounting as having lone-wolf personality traits. If the stereotypes are true, then major field of study is a useful datum for identifying students likely to have a lone-wolf personality type.

The basic goal of our study is to measure the perceived satisfaction and feelings of value derived from working in teams among junior and senior business students as they reflect on team project experiences throughout their undergraduate coursework. We provide an overview of team projects in business education, a review of the lone-wolf personality construct, and the tendency for accountants to be stereotyped as loners. We then present our hypotheses, methodology, and results.

TEAM PROJECTS

The ability to work in teams is considered a valuable skill for professionals in both accounting and marketing. For example, the American Institute of CPAs (AICPA) considers it a "core competency" for entry-level accountants [AICPA, 2005]. From a marketing perspective, McCorkle et al. [1999] assert that the ability to work in a team environment is a skill "prized by practitioners" [p. 106]. They note that working in teams teaches students to accommodate diversity, such as cultural diversity. Campion, Medsker, and Higgs [1993] study teams in a large corporation and assert that heterogeneity in team members' knowledge and experience allows employees to learn from one another and improve team results.

Undergraduate business students in general believe that working in teams is beneficial [Shankar and Seow, 2010; Bolton, 1999]. Bolton [1999] found that 64 percent of surveyed students had a favorable view of team projects. Bolton argues that students with negative views of team projects are not intrinsically opposed to team projects per se but are reacting to external factors, such as insufficiently clear guidance on how teams are to function and unequal participation among team members. Supporting this view, Bacon et al. [1999] found that clear instructions contribute to positive team experiences.

Studies of team projects by business school faculty include an early study by McCorkle et al. [1999], who provide an overview of the use of team projects in

the undergraduate marketing curriculum. Scholars have documented many positive outcomes of team learning, such as higher grades, improved interpersonal skills, and cooperative learning skills. Although scholars have identified several difficulties or drawbacks with team projects, an overall consensus persists that team projects are beneficial for students. Particularly if team projects are designed properly, benefits far outweigh their drawbacks [Pragman et al., 2010]. Previous research has focused to a large extent on outcomes in terms of team performance, but less attention has been paid to student satisfaction with team participation; this circumstance is especially true in accounting education [Opdecam and Everaert, 2012]. In addition, few scholars have focused on individual characteristics that could have an impact on team projects. One such individual characteristic that has not drawn enough attention is student lone-wolf tendency and its relationship with team projects.

LONE-WOLF TENDENCIES

Dixon, Gassenheimer, and Barr [2003] define lone-wolf tendency as “a psychological state in which one prefers to work alone when making decisions and setting/accomplishing priorities and goals” [p. 205]. People with lone-wolf tendencies see others as less effective, have scant regard for others’ ideas, and have less patience for team processes [Dixon et al., 2003]. Further, such people are not enthusiastic about working with others and identify with their tasks more than with the organization they work for [Mulki, Jaramillo, and Marshall, 2007].

Although lone-wolf tendencies are well researched in sales and sales management literature, fewer studies apply this concept in business school education. Barr et al., [2005] were the first to explore the lone-wolf phenomenon among business school students. They argue that lone wolves are not good team players and found that the presence of a lone wolf in a team affects the performance of the team negatively. Shankar and Seow [2010] examined the association between accounting students’ lone-wolf tendencies and perceived usefulness of team work, team interaction behaviors, and team performance. Although they found that the presence of the lone wolf affects team dynamics, it did not significantly affect the performance of the team in terms of graded work products. Seow and Shankar [2014] investigated the impact of instructor-led team skills guidance sessions on lone-wolf students’ perceptions of teamwork. They found that team skills guidance has a positive impact on students with greater lone-wolf tendencies; such students perceive working on group projects to be easier than students who are not exposed to the team skills guidance sessions.

Table 1 below provides a review of existing literature on lone-wolf tendencies among business students.

This study investigates the lone-wolf tendency and its relationship to student satisfaction and feelings of value derived from team projects. We supplement the

Table 1. Summary of Research on Lone-Wolf Tendencies and Business Students

Author(s)	Purpose	Sample	Findings
Barr et al. [2005]	To introduce the concept of 'lone-wolf' in a classroom context and investigate its effect on teams	224 Undergraduate business students completed lone wolf assessment survey.	Lone-wolf phenomenon present among marketing students. Significant positive relationship exists between how others rate a fellow student and how the student rates him- or herself on the lone-wolf scale. Presence of a lone wolf on a team negatively affects team's performance (project grade).
Shankar, and Seow [2010]	To study lone-wolf tendencies in accounting students and investigate their perceptions of team projects.	170 accounting students in Singapore took a two-part survey (Part I at the start of the project and Part II at the end of the project)	Students with higher lone-wolf tendencies perceive fewer benefits from team work. Teams with greater proportion of students with higher lone-wolf tendencies experience less team commitment and team leadership. Students in teams with a greater proportion of members with higher lone-wolf tendencies perceive their team performed poorly on the project.
Seow and Shankar [2014]	To investigate if a team skills guidance session by the instructor impacts the perceptions of students with lone-wolf tendencies.	All students completed a survey	Instructor team skills guidance results in students with greater lone-wolf tendencies perceiving that working on the project to be easier than students who are not exposed to the team skills guidance sessions. Students with higher lone-wolf tendencies are concerned that friendship and popularity distort the reliability of the peer evaluations of team work. Among students with lesser lone-wolf tendencies, those who receive team skills guidance perceive fewer benefits from team work in comparison with students who do not receive team skills guidance.

existing literature with a study that investigates the differences in lone-wolf tendencies among accounting and marketing students. Anecdotal evidence and popular beliefs suggest that accounting students are more likely to be loners than their counterparts in marketing. If the stereotypes are true, then student major field of study could be useful for identifying students likely to have lone-wolf traits.

Many times in pedagogical research, recommendations are made based on personality constructs, such as learning styles and other factors. However, for a variety of reasons, instructors may not wish to administer the necessary survey instrument in their classrooms. A reliable guideline allows instructors to make informed judgments about students without the use of a formal survey. We thus examine the two business majors, accounting and marketing, that are generally thought to be most distinct, particularly in terms of loner qualities. We ask, and use empirical evidence to answer, the following question: Are accounting students more likely to be loners (lone wolves) and therefore require special attention when, for example, assigning students for group projects?

ACCOUNTING AND MARKETING STEREOTYPES

Portrayal of accounting and marketing professionals in a stereotypical way has been documented in the literature for a long time. Literature, professional magazines, TV programming, and films have been the outlets for advancing this type of stereotyping [Samkin, 2010]. The stereotypical portrayal of accountants is that of a bean counter, with traits such as introversion and shyness [Dimnik and Felton, 2006; Hunt, Falgiani, and Intrieri, 2004; Smith and Briggs, 1999]. A study by Miley and Read [2012] examined contemporary jokes and found that accountants continue to be stereotyped as dull and boring, and the analysis confirms prior research by Jeacle [2008]. In a study by Schlee, Curren, Kiesler, and Harich [2007], when students were asked for their perceptions of business majors other than their own, management and marketing students were rated as the best team players.

Studies have also compared accounting and marketing students. Kochunny, Rogers, and Ogbuehi [1992] examined differences in various traits of marketing and accounting students, finding that marketing students rate spontaneity, open-mindedness, and flexibility higher in importance than did accounting students. Noel, Michaels, and Levas [2003] examined personality traits and choice of a business major, and found that accounting students are less interested in human contact than marketing and MIS students. Ameen, Burns, and Jackson [2010] surveyed college students in 1998 and again in 2006, analyzing scores on four types of oral communication: one-on-one, small group, classroom, and public speaking. They initially found that accounting majors have significantly higher anxiety than business or nonbusiness majors in one-on-one and small-group settings, but not in classroom and public-speaking settings. Interestingly, by 2006 all significant differences between any of the four types had disappeared. Pringle,

DuBose, and Yankey [2010] examined personality characteristics of 899 students majoring in business administration fields and found that marketing majors were the most extroverted, whereas accounting students scored highest in conformity. They conclude that the most extroverted business students are likely to gravitate to marketing, and the least extroverted become CIS or accounting majors.

HYPOTHESES, METHODOLOGY, AND RESULTS

We expect that students with lone-wolf tendencies will express fewer positive feelings toward team projects than other students. Shankar and Seow [2010] found that teams with a greater proportion of students with high lone-wolf tendencies experienced less team commitment. Further, such teams also rated the outcome of their project negatively. Love wolves participate in teams unwillingly [Mulki et al., 2007]. In fact, they “may not readily communicate, collaborate, cooperate, or compromise, all of which are necessary for effective and successful teaming” [Barr et al., 2005, p. 85]. Hence, based on these findings, we advance the following two hypotheses.

H1: There will be a negative correlation between students’ lone-wolf tendencies and their perceived value derived from participating in team projects.

H2: There will be a negative correlation between students’ lone-wolf tendencies and their feelings of satisfaction from participating in team projects.

Next, we examine whether lone-wolf tendencies occur more frequently among accounting students in contrast with marketing students. Accountants are highly stereotyped as reflected in books, movies, and other media [Carnegie and Napier, 2010; Dimnick and Felton, 2006; Friedman and Lyne, 2001]. Many aspects of the stereotype correlate with the lone-wolf personality; for example, the accountant is depicted as reclusive, introverted, inflexible, eccentric, and unsociable. In short, a strong perception exists that accounting as a profession attracts people who are loners who prefer to work with numbers rather than people. We therefore advance our third hypothesis as follows:

H3: Lone-wolf tendencies will be higher for accounting students than for marketing students.

Sample and Data Collection

The participants in this study were business students from a midwestern university in the United States. Students were asked to fill out a survey instrument that contained questions relating to three scales and several demographic variables. The three-scales measured satisfaction with team activities, perceived value

Table 2. Summary of Descriptive Statistics

N = 101	Mean	SD	Min	Max
Age	24.10	6.88	18	55
GPA	3.21	0.451	2	4

Demographics & Major:	Percentage:
Gender	
Male	49.5%
Female	50.5%
Classification	
Freshman	2%
Sophomore	5%
Junior	21%
Senior	72%
Ethnicity	
African American	3%
Caucasian	90%
Other	7%
Major	
Accounting	54.46%
Marketing	45.54%

of team activities, and lone-wolf tendency. Survey instruments were distributed in several upper-division undergraduate accounting and marketing classes in consecutive fall and spring semesters. A total of 156 surveys was obtained. Surveys that were filled out by accounting and marketing majors were retained, and all other business majors (e.g. management) were excluded. Surveys from students who had a dual major were also retained if they indicated accounting or marketing as their primary major. This exclusion resulted in a sample of 101 students (46 marketing and 55 accounting majors). The mean age of respondents was 24.10 years ($SD = 6.81$). Respondents comprised 49.5 percent males and 50.5 percent females, and 90 percent were Caucasians. Ninety-three percent of the students were either juniors or seniors. The descriptive statistics are shown in Table 2.

Measures

All measures were taken from extant literature. Lone-wolf tendency was measured using a three-item, five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) developed by Barr et al. [2005]; the reliability of the scale is 0.853. Satisfaction with team projects was measured using a five-item, five-point Likert scale; two items were taken from Tseng, Wang, Ku, and Sun [2009], and

Table 3. Means and Correlations (N = 101)

	1	2	3
	LW	VAL	SAT
1. Lone-Wolf Tendencies (LW)	1.00		
2. Value of Team Projects (VAL)	−.492**	1.00	
3. Satisfaction with Team Projects (SAT)	−.641**	.676**	1.00
<i>Mean</i>	2.8965	3.8144	3.4713
<i>SD</i>	.7936	.6852	.8669

**Correlation is significant at the 0.01 level (2-tailed).

three items from Napier and Johnson [2007]. The reliability of the scale is 0.891. Perceived value of team projects was measured using a four-item, five-point Likert scale developed by Pragman et al., [2010]. The reliability of the scale is 0.734. All measures have acceptable reliability above 0.70 recommended by Nunnally and Bernstein [1994]. Means, standard deviations, and correlations of the variables are presented in Table 3.

RESULTS

Table 3 displays mean values for the three key variables in our study: lone-wolf tendency (LW), perceived value of team projects (VAL), and satisfaction with team projects (SAT). The mean for VAL of 3.8 exceeds a neutral response of 3.0 and confirms that the students in our sample view team projects as having value. This finding is consistent with the findings of previous studies [i.e. Bolton, 1999; Shankar and Seow, 2010].

H1 proposed that there will be a negative correlation between lone-wolf tendencies and students' feelings of value derived from participating in team projects. The results support a significant negative correlation between lone-wolf tendency and perceived value of team projects, $r = -0.492$, $n = 101$, p -value < 0.000 (two-tailed test). Lone-wolf students perceive less value from participation in team projects than other students.

H2 proposed that there will be a negative correlation between lone-wolf tendency and satisfaction with team projects. There is a significant negative correlation between lone-wolf tendency and satisfaction with team projects, $r = -0.641$, $n = 101$, p -value < 0.000 . Lone-wolf students experience less satisfaction from participation in team projects than other students.

H3 proposed that accounting students would exhibit higher lone-wolf tendency than marketing students. Table 3 indicates that the overall mean for LW ($n = 101$) is 2.9 ($SD = 0.7936$). The individual mean for accounting ($n = 55$) is 2.89 ($SD = 0.799$) and for marketing ($n = 46$), it is 2.91 ($SD = 0.795$). An independent sample t -test using SPSS 20.0 [$t(99) = -0.019$, $p(0.906) > 0.05$]

confirms that these means are indistinguishable. Thus, H3 is not supported, and our results suggest there is no significant difference in lone-wolf tendency among accounting and marketing students.

DISCUSSION AND RECOMMENDATIONS

The use of team projects in business schools is prevalent [Barr et al., 2005; McCorkle et al., 1999]. The present study investigated lone-wolf tendencies among junior and senior business students, as well as the relationship between lone-wolf tendencies and students' perceived value of and satisfaction with team projects.

Our study documents a clear correlation between lone-wolf tendencies and students' feelings of satisfaction and value derived from team projects: upper-level business students, when reflecting on their team project experiences, have negative feelings if they fit the lone-wolf personality type. We concur with Barr et al., [2005] who suggests that faculty members identify lone wolves before student teams are formed to avoid negative impacts on team performances.

We offer the following strategies to effectively integrate lone wolves into team projects to enhance the perception of value and satisfaction.

- Lone-wolf students may be assigned to various teams. Ideally teams would have at most one lone wolf, which helps to minimize the impact on any one team.
- Establish guidelines for functioning of teams, including what is required of each team member. This specificity reduces ambiguity of roles among student members and helps lone wolves see clearly what is expected of them. If lone wolves are to be accommodated more effectively into teamwork, instructors must provide clear direction and guidance.
- Instructors should encourage team members to learn about one another by having each member write down and share their areas of strengths and expertise. This task helps lone wolves see other members' capabilities and thereby value their contributions to the team.
- Instructors may reinforce the above recommendations by having teams and team members complete team expectations forms, team member "get to know you" forms, and peer evaluation forms (for example forms, see Oakley, Felder, Brent, and Elhadj [2004]).

Additionally, instructors can foster a spirit of teamwork by devoting one class session to a discussion of group dynamics and personality types, possibly with administration of a personality survey. Often students are not aware of the value placed on teamwork in the business world, and they may not recognize their own lone-wolf tendencies. When educated about these issues,

lone-wolf students may see value in teamwork and increase their contribution to the team.

Another strategy would be to allow lone-wolf students to work on their own. This practice has the potential to increase satisfaction for both the lone-wolf students and the student teams. This method, however, may be seen as a surrender in the sense that it sees the lone wolf as a permanent trait that cannot be changed. Including the lone wolf in teams with other students is optimistic in that it may change the lone-wolf student's attitude toward working with others. Indeed, part of the reason for including team projects at the undergraduate level is to alter behavior patterns of young people while they are in a formative stage.

Identification of the Lone-wolf Student

As indicated above in our recommendations, instructors contemplating group projects ideally should identify lone-wolf students. However, it is understandable that instructors may hesitate to do this in their classrooms. Survey instruments cannot entirely disguise the personality aspect they are trying to elicit, and students may sense they are being identified. Accordingly, the majority of our recommendations are designed to improve the integration of lone-wolf students without the need to identify them.

Instructors following the recommendations of pedagogical studies may be tempted to turn to shortcuts or their own intuitive judgments about student characteristics. Our study suggests that this may be a questionable endeavor. Our study did not find any difference between accounting and marketing students in lone-wolf tendencies. In other words, we can say that, contrary to popular belief and anecdotal evidence, lone-wolf tendencies are not concentrated among accounting students. Thus, using student major as a shortcut way to identify the lone wolf is not warranted, and instructors should be mindful not to allow the "accounting major" label to influence their judgment about whether the student would be a positive team member. The stereotype associated with accountants is pervasive and difficult to change, and even experienced professors may unknowingly possess biases [Wells, 2010].

If an accounting student is generally observed to have a quiet demeanor, it does not mean the individual is a lone wolf and would exhibit dysfunctional behavior in a team setting. Similarly, a marketing student who is outgoing socially may in fact possess lone-wolf traits and be a poor team player. In the same vein, it has been thought that males may be more likely to have greater lone-wolf tendencies than females are perceived to have [e.g. Mulki et al., 2007]; however, in our analysis, we found no difference in our sample to support this view. With any bias or stereotype, instructors must be vigilant not to allow preconceived notions to influence their view of students and how they might function in a team setting.

LIMITATIONS AND FUTURE DIRECTIONS

As with any study, caution must be exercised when extending the results beyond the scope from which data were collected. Data were collected from a medium-sized, state-supported institution. The business school supports undergraduate programs only and was newly AACSB accredited several years before the study was completed. In addition, the university is an open-enrollment institution, with nonselective admissions criteria. As a result, the range and standard deviation of students' ACT scores are significant. The university serves a diverse student body in terms of socioeconomic background and in terms of the following dyads: residential/commuter; full-time/part-time; traditional age/nontraditional age. Thus, the data in our study reflect a good range of values on these dimensions.

On the other hand, the university does not have a significant international student presence and is not racially or culturally diverse. Most students are Caucasian and come from the midwestern section of the United States. Thus, although the data in this study reflect good coverage of several dimensions, the results should be extended with caution to contexts involving varying degrees of international, racial, or cultural diversity.

In terms of future research, several areas of inquiry remain open for further investigation. An investigation of the occurrence rate of the lone-wolf trait in non-U.S. student populations would be a first step in extending the current work. For example, one might measure the lone-wolf tendency among university students in China. The occurrence of the lone-wolf trait in another social context may shed light on cultural factors affecting lone-wolf tendencies. Further inquiry could then study the impact of the lone-wolf trait on team projects when including both the functioning of teams as well as feelings of value and satisfaction derived from team participation.

Further extensions of the current work could include an analysis of graduate students and online team projects in which student teams meet only virtually. Future research in these areas should continue to look at how lone-wolf tendencies correlate with team functioning (i.e. effectiveness) as well as feelings of satisfaction and value associated with team projects.

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GMAT Scores by Country with Implications for MBA Programs

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GMAT scores are found to differ across countries, even after adjustment for participation rates, with a range of about 1 1/2 standard deviations of the scores of individuals. Average GMAT scores by nation are highly correlated with the regions of the world and with average IQ by nation. These findings may argue for some adjustment of GMAT scores for candidates for the MBA from certain nations.

Keywords: GMAT, MBA, IQ

Disciplines of Interest: Economics, Psychology

INTRODUCTION

The GMAT is a widely-used, standardized, English-language test designed for candidates for the MBA and for other graduate education programs in business. While it is not an intelligence test, it covers skills considered by its sponsor to be important for academic success, as well as for success in the real world of business. It is therefore an aptitude test, as distinct from an intelligence test. Specifically, the test covers analytical, writing, quantitative, verbal, and reading skills. Other than being an English-language test, the GMAT is not a knowledge test. Nowadays, about half of the candidates taking the test indicate their country of citizenship to be other than the United States. It may be important to note that the country of residence of a test-taker may differ from his country of citizenship.

Average test scores vary significantly by country of citizenship. Among countries with at least 1,000 test-takers during the five-year period from 2008–2009 to 2012–2013, national averages ranged from 324 (Saudi Arabia) to 595 (Singapore), while 544 is the global average and the standard deviation is about 100. Among countries with at least 4,000 test-takers, other low national averages included Egypt, Israel, and Nigeria, and other high national averages included China, South Korea, and the United Kingdom. The United States, at 532,

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Table 1. Selected Average GMAT Scores by Country, 2009–2013

Country	Average GMAT score	No. of test takers
Brazil	554	8,445
Canada	565	37,001
China	589	205,084
Egypt	463	4,614
France	559	18,039
Germany	570	19,488
India	576	138,445
Israel	492	12,462
Mexico	500	9,344
Nigeria	447	7,173
Saudi Arabia	324	9,779
Singapore	595	6,297
South Korea	581	28,484
Thailand	498	10,700
United Kingdom	590	8,814
United States	532	582,167

had a national average a little below the global average. Table 1 presents selected results.

CORRELATION OF GMAT SCORES WITH IQ AND REGION

Columns A and B of Table 2 shows that average GMAT scores by country correlate strongly with average IQ scores by country, both with and without correction for participation rate. The data for IQ scores are from Rindermann [2007]. He shows that average scores on certain internationally-standardized primary and secondary achievement tests correlate strongly with average IQ scores by country, and uses the same to improve estimates of average IQ scores by country. Even so, he still winds up with many interpolations based on out-of-country data, as do Lynn and Vanhanen [2002].

The GMAT test-takers are generally young adults who have successfully navigated to the tertiary level of schooling, often have real-world experience relevant to business management, and choose to take the exam, presumably weighing the costs and benefits involved. Because of self-selection, it may be important to correct for participation rate when comparing GMAT scores across countries, just as should be done when comparing SAT scores across states [Grissmer, 2000; Powell and Steelman, 1996]. It is expected that the average score will fall as participation increases. Indeed, the participation rate variable enters the regression very significantly and as expected (column B of Table 2).

**Table 2. Regression Analysis of Average GMAT Scores by Country
($n = 169$), 2009–2013, 169 Countries**

Parameter	A	B	C ^b	D ^b
Constant				
Estimated coefficient	384.6491	350.3277	535.2393	597.82
Standard error	28.3678	25.3567	2.7266	9.84
t statistic	13.56	13.82	196.30	60.73
Participation rate ^a				
Estimated coefficient		–5.3479E-06		–9.6472E–06
Standard error		7.5009E-07		1.4706E–06
t statistic		–7.13		–6.56
IQ				
Estimated coefficient	1.6398	2.1725		
Standard error	0.2899	0.2652		
t statistic	5.66	8.19		
West Europe				
Estimated coefficient			11.2329	–42.22
Standard error			7.5426	10.56
t statistic			1.49	–4.00
East Europe				
Estimated coefficient			13.6052	–48.68
Standard error			13.8822	15.59
t statistic			0.98	–3.12
East Asia				
Estimated coefficient			45.4142	–13.65
Standard error			4.9298	10.02
t statistic			9.21	–1.36
South Asia				
Estimated coefficient			26.5217	–35.93
Standard error			5.8788	10.86
t statistic			4.51	–3.31
Latin America				
Estimated coefficient			–19.1187	–81.29
Standard error			11.3517	13.86
t statistic			–1.68	–5.87
Africa				
Estimated coefficient			–91.7532	–154.32
Standard error			14.5161	16.06
t statistic			–6.32	–9.61
Islamic World				
Estimated coefficient			–95.2578	–154.82
Standard error			11.4431	13.65
t statistic			–8.32	–11.34
R squared %	99.59	99.69	99.81	99.85

^aObservations weighted by the square root of the number of test takers. Participation rate = (test takers per 100,000 persons aged 20 to 24)², where the exponent was determined by a grid search.

^bReference group in columns C and D consists of highly advanced English-speaking countries (Australia, Canada, Ireland, New Zealand, United Kingdom, and United States).

GMAT scores by country are also highly correlated with region. Regions are determined by the World Values Survey [Inglehart and Welzel, 2015]. These include (A) six advanced English-speaking countries (the reference group), (B) West Europe (combining WVS “Protestant Europe” and “Catholic Europe”), (C) East Europe (WVS “Orthodox Europe”), (D) East Asia (WVS “Confucian Asia”), (E) South Asia, (F) Latin America, (G) Sub-Saharan Africa, and (H) the Islamic World (corresponding to the Middle East/North Africa region plus Central Asia). The WVS is helpful for demarking certain within-continent borders, for identifying Central Asia as part of the Islamic World, and Israel as part of West Europe. As no differences were found in this investigation between Protestant and Catholic Europe, the two WVS regions are combined. Certain small countries on regional borderlines, for which specific locations are not provided by the WVS, are apportioned 50-50 to the adjoining regions. Looking at the scores without adjustment for participation (Column C of Table 2), it appears that East Asians do the best, with South Asians next. Africans and people from the Islamic World do the poorest. The range of the regional averages is about 1 1/2 standard deviations of the scores of individuals, which is comparable to the range of national average IQs by region. Adjusting for participation (Column D of Table 2) puts the reference group (six advanced English-speaking countries) in first place, with East Asians insignificantly behind. The range remains about 1 1/2 standard deviations.

DISCUSSION

Given the significant increase in IQ during the past century in a number of advanced countries [Flynn, 1984, 1987], it should not be surprising that there would be differences in intelligence among the countries of the world. Sowell’s [1977] path-breaking work on the malleability of intelligence of populations over time, focusing on white immigrant groups in the United States during the early 20th century, showed that it was possible for ethnic subgroups within a country to catch up with the dominant group. Recent experience with Eastern Germans [Roivainen, 2012] shows a remarkable change in national IQ. At the time of the fall of the Berlin Wall, the national average IQ in East Germany was about 1 standard deviation lower than the national average IQ in West Germany. Today, there is little or no difference. Without attempting a survey of the literature, the list of possible causes of the intelligence of populations includes genetic inheritance, family, neighborhood and cultural effects, nutrition, formal education, and economic opportunities.

While IQ and region were each significant when entered separately into the regression, IQ was not significant when added to regressions that included region. This result indicates that the IQ variable is not correlated with within-region variation in GMAT scores and should caution against the use of interpolations. There may be no good substitute for direct measurement.

IMPLICATIONS FOR MBA PROGRAMS

The similarity of GMAT scores adjusted for participation in five of the eight regions of the world argues against any adjustment of these scores for the purpose of admission to graduate programs of business education for candidates whose country of origin is any of these regions. With regard to the Islamic World, Sub-Saharan Africa, and possibly Latin America, an argument could be made for some adjustment of GMAT scores.

The average GMAT scores of students entering top business schools, per *U.S. News & World Report* rankings, are very high. If performance in graduate business educational programs can be predicted based on aptitude (as indicated by the GMAT) and motivation as reflected in past education performance (as might be indicated by GPA, choice of major, and quality of the undergraduate school), and if the top business schools skim the most promising students from the pool of applicants, then there may be little predictive power to the GMAT score in the residual pool of applicants. To illustrate this, I generated populations in which academic performance is determined equally by aptitude and motivation, each of which is observed with error, and in which the most promising applicants are skimmed by the top schools. When there is 5 percent measurement error in each of aptitude and motivation and 37.5 percent of applicants are skimmed, the predictive ability of the GMAT score falls from 50 percent in the entire population to 10 percent in the residual pool. To be sure, geographic considerations and other peculiarities of specific MBA programs would mean that the sorting of candidates would not be perfect. This would seem to open up some opportunity for alternative criteria for MBA admissions for many schools of business, especially for candidates whose country of origin is in one of the lower-GMAT-scoring regions.

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Training MBAs to Use Management Research

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Management faculty have long lamented that their scholarship is rarely used by practitioners. We suggest that attempts to close the scholarship–practice gap should first begin in the classroom. In this paper, we: 1) provide an overview of the challenges faced when getting practitioners to use management scholarship in business decision-making; 2) make the case for using management research in the MBA classroom; and 3) provide a novel pedagogical use of such research that can enhance students' critical thinking skills and help ensure that MBAs are better equipped to use academic research in their careers.

Keywords: Decision-Making, Training MBAs, Research-Practice Gap

Disciplines of Interest: Pedagogy, Decision-Making

INTRODUCTION

Much has been written about the gap between the practice of management and the scholarship of management faculty, but we believe it is possible to use an extensive amount of management research in the classrooms of American MBA programs.¹ We outline such an approach in this paper. This approach is also designed to help build the critical thinking skills of MBA students.

In the next section, we review some of the literature about the research–practice gap in management, and we make the case that future practitioners should indeed use scholarly research articles to assist decision making in their current or future careers. Next, we describe our pedagogical approach, including a discussion of a critical thinking model known as the Steps for Better Thinking Model [Lynch and Wolcott, 2001], as well as how our approach aligns with that model.

We include a flowchart to help faculty and students determine which research articles might best be used in our suggested classroom assignment, a description

¹There are graduate programs in management, many of them in European countries, that emphasize the study of management from a more scientific approach than most American MBA programs and executive MBA programs. Our pedagogical approach therefore is more applicable to MBA programs in the United States.

of the assignment for distribution to students, as well as an example of a completed assignment that faculty may decide to distribute to students.

THE RESEARCH-PRACTICE GAP

Why would a practitioner *not* choose to use management scholarship in business decision-making? One reason may be that most “research published in academic journals is written primarily for other academics” [Terpstra and Rozell, 1998, p. 23]. The intricate statistical methods and complex language can make it hard for practitioners to digest. In addition, academic research in management appears in visually unattractive journals that are costly, difficult to access, unknown, and not credible to managers. Understandably, practitioners prefer readily available information that does not suffer from such drawbacks, and they seek knowledge from high-profile, non-academic authors in trade journals or books [Rousseau, 2006]. Practitioners simply do not have the time to fully understand the “products” of academic scholarship, nor do they have adequate training. Moreover, were practitioners to rely heavily on management research in making key decisions that ultimately failed, they could suffer reputational effects by drawing on a source of information that is not credible to their peers.

This raises the question: Why have scholars not actively engaged in creating work that is desired and welcomed by practitioners? One answer is that management Ph.D.s, by and large, are not trained to write for a practitioner audience. Why should they be? Their first jobs out of their doctoral programs will not be determined by the practical relevance of their scholarship, nor will their annual performance reviews. In addition, tenure and promotion decisions are often not made based on the candidates’ impact on the practice of management. Scholars have little incentive to do work that is trustworthy and valuable to practitioners [Kepes, Bennett, and McDaniel, 2014]. In fact, writing for practitioner-oriented journals involves a great deal of risk, given the difficulty of placing such work in journals that are considered top-tier publications by scholars and administrators.

Even though practitioner-friendly research is not particularly promoted in academia, scholars have recognized the need for a conversation about the scholarship–practice gap. Much of the work addressing this gap has focused on the ways to make management research more useful to practitioners. This stream of literature suggests that scholars should focus on useful research questions and data collection [Dunnette, 1990], write practitioner-friendly versions of their academic manuscripts [Nowicki and Rosse, 2002], and engage in close collaboration with business leaders to find the nuances of complex issues leaders face [Starkey and Madan, 2001; Van De Ven and Johnson, 2006].

Some researchers believe that we either should not, or could not, produce rigorous research that is relevant and useful for practitioners. Kieser and Leiner [2009] contend that the different modes of communication for scholars versus practitioners are irreconcilable and that the two groups could never even collab-

orate effectively on research projects. These authors provide four thought-provoking examples of collaborative projects to drive their point home (see p. 518). Other scholars reject the premise that evidence-based management (EBMgt) could close the research–practice gap, because the scholarly evidence may not be trustworthy and useful to practitioners [Kepes, Bennett, and McDaniel, 2014]. The reward structure to scholars encourages the publication of new results and not the replication of prior studies, which would enhance the trustworthiness of the studies’ results. It is also possible that future practitioners will not use academic research if they did not learn about it in the textbooks used in their classes. Stambaugh and Trank [2010] looked at strategic management texts to determine the extent to which well-established research in institutional theory was included. They found that fewer than half the books included this coverage, and the coverage was shallow.

Burke and Rao [2010] suggested the research–practice gap can be narrowed by strengthening the link between teaching and research, and we agree. Our approach is to bring future practitioners to the research (outside of textbooks) by providing a tool to help faculty and MBA students select the research to review and provide guidance for students for that review. There is limited empirical evidence to support whether graduates of management education use the results of management research, but Jarzabkowski, Giuletti, Oliveira, and Amoo [2012] used a survey of over 1,400 management graduates to determine whether they used the decision-making tools they learned in their courses. They found, among other things, that increased exposure to these tools in courses increased the use of the tools in the students’ later careers, which provides some support for our pedagogical idea.

MAKING THE CASE TO (FUTURE) PRACTITIONERS

There are several reasons that the future practitioners now in our classrooms should become familiar with high-quality management research. First, practitioners should lean on academic findings, because such an approach is recognized by experts to be effective. The Center for Evidence-Based Management (CEBMA)—a nonprofit organization founded by an international group of management scholars and practitioners—places the results of scientific research among the most important contributions to managerial decision-making.

Second, practitioners should use academic research because some of it, though clearly not *all* of it, is relevant to what may be their most critical challenges: managing the decision-making process and enhancing innovation. Dierdorff and Rubin [2006] found two competencies (the strategic decision-making process and managing innovation) to be significantly more important to managers than all other behavioral competencies. Sadly, these authors later found a major misalignment between the skill sets needed by managers and the ones supplied by MBA programs [Rubin and Dierdorff, 2009].

Third, practitioners should employ academic research because it is a unique source of important management-related scientific findings not available elsewhere that may, therefore, yield a competitive advantage. Some might suggest that practitioner-oriented periodicals are fine as a source of reader-friendly versions of quality academic research. Indeed, management-focused popular media might be well-regarded sources. However, those publications often lack scientific grounding. The scientific basis for *Harvard Business Review* articles is “rather weak” [Schulz and Nicolai, 2015, p. 43]. Another investigation of three widely recognized practitioner outlets—*Human Resource Management*, *HR Magazine*, and *Harvard Business Review*—showed that these publications rarely discuss scientific results [Rynes, Giluk, and Brown, 2007].

The popular business media also suffer from a delay in the introduction of new information. Conducting and publishing managerial research takes a considerable amount of time, often years. The translation of academic research into practitioner-friendly language, and the publication of such work in practitioner-oriented journals or even textbooks [Peng, Nguyen, Wang, Hasenhuttl, and Shay, in press], adds even more time before managers can access the findings and use them in their decision-making.

We argue that practitioners can greatly benefit from learning how to understand and interpret management academic literature—specifically, how to recognize the most relevant topics and extract the essence of the research findings for further consideration in business decision-making. We are confident that many practitioners, including those sitting in MBA classrooms, will be interested in academic management research as a source of information when making managerial decisions. The challenge, as we see it, is in applying a pedagogical approach that enhances the practitioners’ appreciation for the advantages of using this research for business decision-making and helps them develop skills in identifying and translating this research.

TOWARD A PEDAGOGICAL APPROACH

Rousseau stated, “. . . Decision quality is a direct function of available facts, creating a demand for reliable and valid information when making managerial and organizational decisions” [2006, p. 206]. Training future managers to discriminate among information sources based on the validity of findings will help them discover high-quality evidence. In other words, we argue that one of the valuable contributions of EBMgt is to provide a means for managers to question—or deny—parts of their assumption bases [Davis, 1971], which is a critical tenet of effective decision-making. How can we teach future practitioners to separate fads and opinions from high-quality findings? Moreover, how can we provide them an opportunity in their MBA programs to develop the skills required to access and interpret management research?

This quandary is clearly a shortcoming of current curricular approaches found in many American MBA programs. In an interview for *Academy of Management Learning and Education*, Russell Ackoff indicated that, among other things, business education gives students a “ticket of admission to get a job where they could learn something about management” [Detrick, 2002, p. 56]. Indeed, Indra Nooyi, former CEO of PepsiCo, mirrors this opinion and states, “We have these kids who don’t know anything about business in great detail. They come out [of business school] saying they’ve got an MBA and they’ve got an education but not knowledge” [*The Economist*, November 2016]. Business schools’ faculty are able, however, to provide more value than that. One of the ways we can do so is by training MBA students to make decisions with information that is at least partly grounded in results found in our field’s leading academic studies.

Of course, not all management research will be useful to practitioners. Shapiro, Kirkman, and Courtney [2007] noted that some management research is “lost *before* translation,” where researchers are addressing problems that are not helpful or interesting to managers. As mentioned earlier, we are unlikely to solve this problem in the short run due to the structural foundation (e.g. academic culture and hiring/promotion policies) of our discipline. However, we can salvage “lost *in* translation” studies, where potentially relevant knowledge is not presented in a way that managers can use [Shapiro, Kirkman, and Courtney, 2007]. Thus, we suggest the focus of such MBA training should be on the “lost *in* translation” studies. Said differently, management professors should train MBA students to both identify and interpret studies containing actionable findings.

How can students locate actionable research studies? Pearce and Huang [2012] classified articles as actionable if the answer was “yes” to all three of the following questions:

1. Are the research findings more than purely descriptive accounts of uncontrollable circumstances?
2. Can a causal conclusion be made?
3. Does the causal conclusion translate into a practical action that can be taken?

We recommend that faculty teaching MBA courses adopt these elements of Pearce and Huang’s definition of actionable research to assist MBA students in learning to identify, understand, and use actionable management research to make key management decisions.

Using management research in the classroom is by no means a novel idea. Christine Quinn Trank created a course called “Evidence-based Practice” [Trank, 2014]. Lockwood Keats, and Dess [1989] and Dess and Markoczy [2008] proposed an assignment where MBA students were challenged with providing critiques of academic articles. We build on this idea and provide a more structured approach with the following three components.

First, *motivation*: We must encourage students to face their biases and assumptions. Second, *skill development*: We must teach students how to locate articles that may be actionable for managers and extract knowledge from them. Third, *structure*: We must give students clear guidance and a structure for the process. In the following paragraphs, we provide details about each of these three components.

Motivation

A course that contains a module or an assignment about using evidence-based research should help students learn how to seek knowledge. In Erez and Grant [2014], Adam Grant describes how he convinces students that academic findings offer useful insights to managers. Grant starts his first class with examples from medicine. He asks students to guess the correlation between taking pain-relieving medications and actual pain reduction. Students are astonished when he reveals that it is only 14 percent. Grant continues with similar examples that overturn students' biases and expose their underlying assumptions. He concludes with the introduction of some rigorous management-research findings that show stronger associations than his examples from medicine. Students find this approach intriguing because it "... challenges (weakly held) assumptions ..." [Erez and Grant, 2014, p. 109].

Similarly, Amir Erez engages students by demonstrating that their intuition does not always lead to appropriate decisions. He uses a case study where students inevitably make a conclusion that he likens to NASA's, 1986 decision to launch the space shuttle Challenger in extremely cold weather. Students learn that people tend to seek information that agrees with their previously held beliefs (i.e. people have confirmation biases), and that intuition can lead to problematic outcomes.

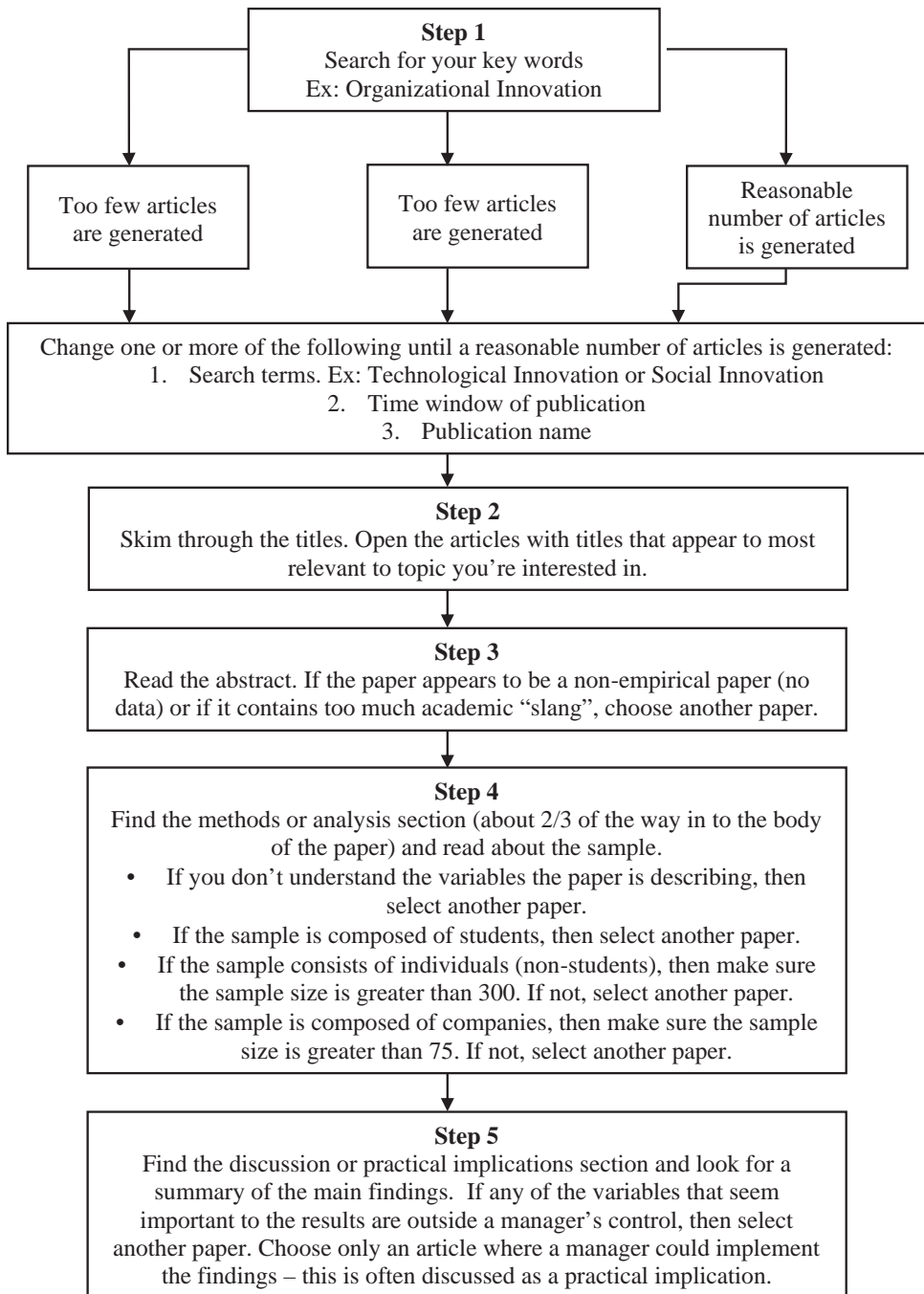
Approaches like the ones proposed by Erez and Grant [2014] play a critical role in students' motivation, and these approaches can illustrate the relevance of academic research to one's career. Once students realize the results of management research can be relevant to their actual job requirements, their motivation to use these results increases [Colquitt, LePine, and Noe, 2000].

Skill Development

Once students are motivated to engage with the results of academic research, they need to gain and practice the skills needed for this process. Because understanding and translating management research into actionable knowledge is a challenging task, we developed a multistep approach (Figure 1) for faculty to use in guiding students through the process of identifying actionable/relevant management research.

Students begin by using their university library's resources and searching leading academic management journals for relevant information on topics of their choice. The subject of the search can be generated by the students' curiosity or

Figure 1. Flowchart for Choosing an Article for the Assignment



assigned by a professor. Students can further narrow or expand the search results by changing the time frame for the publication and/or the search terms (Step 1 in Figure 1). If students are not familiar with using the university library's databases, instructors can show them an example in class. To facilitate success with this exercise, we strongly suggest that faculty provide a list of leading management research journals that the professor believes to be appropriate for the subject matter to be researched.

Students are then asked to skim through titles and abstracts to select only empirical studies that appear to be understandable and relevant (Steps 2–3). We encourage faculty to stress the significance of an appropriate sample, both its nature and its size (Step 4). For example, we recommend that students ignore studies in which the data come from a sample of students, and that faculty provide suggested minimums for sample sizes. In Figure 1, this is n for samples of individuals and n^* for samples of companies.

Finally, students are asked to review the discussion sections of the articles and find summaries of the articles' main findings (Step 5). Students should not choose an article if it uses constructs that are not under a manager's control. Currently employed MBA students, or those with work experience in an organization, are more likely to recognize when a variable is controllable by a manager, and we recommend that faculty discuss this important issue with the students in class or in the body of the assignment's instructions.

Structure: Assignment Instructions and Example

The search guidance above lays the groundwork for students to transform the findings from an academic article into actionable insights for decision-makers. Professors should provide specific instructions for this assignment like those found in Table 1.

We suggest that students be given a limit of two pages for their summary so that they must significantly condense the insights found in their chosen studies. Appendix 1 offers an example that is a translation of a study by Erdogan, Bauer, Truxillo, and Mansfield [2012], and this or a similar example should be given to the students. We recommend that the summary include a discussion of the data the study used, so that students are aware of the robust nature of this research. Students should also summarize the article's conclusions (or the conclusions they wish to emphasize), which helps them see how the data analysis was used by the researchers to create relevant results. Students should reflect on the study by providing a brief overview section and a condensed list of the "key takeaways."

The bulk of the assignment's submission should discuss what the research shows and why the study's results matter. Students should be encouraged to discuss ways the results can be used to make a difference in an organization. Each of these tasks presents an opportunity for the critical evaluation of information, exposure to alternative ways of thinking, and practice with gleaned real-life business applications from the results of management research. The example

Table 1. Assignment Instructions

Assignment task
1. Provide the full citation of the study you are reviewing.
2. Include an overview of three to five sentences that in your opinion summarize the most important points in the study.
3. Discuss the key points found in the article. Also, clearly state (a) the purpose of the study, (b) the sample that was used, and (c) what the author/authors of the study have found.
4. Write a reflection on how the findings of the study might benefit (or not) your job/company. Also, include your evaluation of the pros and cons of the research results as related to the specific business setting in which you work.
5. (Optional) Describe how your use of the study's results might change if some of the underlying assumptions changed or if there was a change in the existing business environment.

assignment submission in Appendix 1 not only provides guidance for students, but also sets expectations for their performance.

Critical Thinking Skills Development

This approach will provide students with enhanced knowledge, a new level of comfort with academic articles, better decision-making abilities, and improved critical thinking skills. Ireland [2014, p. 265] believes that an academic study must enhance readers' critical thinking skills, or it really cannot be considered relevant. Similarly, Celuch and Slama [2008], in an experimental setting, concluded that students are more likely to become lifelong learners if they have educational learning experiences that help develop thinking skills.

To evaluate how our approach may help MBA students enhance their critical thinking skills, we refer to the Steps for Better Thinking (SBT) Model [Lynch and Wolcott, 2001; Wolcott and Lynch, 2002; Wolcott, 2005]. The SBT Model is a developmental model for critical thinking skills and applies to college-age individuals.

The SBT Model is based on students' beliefs about where knowledge comes from and has five levels of cognitive performance, called steps, from Step zero through Step 4. The skills required for students to move from one step to the next are developed sequentially. This requirement means, for example, that a student at Step 1 is unable to consistently display the skills required for Step 3. Individuals must practice the skills at each step before their cognitive development advances to the next step. It is helpful for faculty to understand each of the steps in the model, so they are aware which step is targeted by each task in an assignment. The IDEA paper by Lynch and Wolcott [2001] is a short and easy-to-read description

of the SBT Model and its steps. The next few paragraphs in this paper describe sections from that paper.

A student at Step zero believes that knowledge comes from experts (e.g. professors), and it is the student's job to memorize this knowledge. This student approaches an assignment with the idea that he/she must find the one correct answer to the assignment, and he/she does not grasp ambiguity or uncertainties. The professor is the expert, and information passed on by the professor is digested and given back during assignments and exams. Any exam question that is phrased a bit differently than it was in class is considered a "trick question."

Eventually individuals recognize that even experts have differing opinions and hence put little trust in information from others. These students are now Step-1 thinkers; they appoint themselves as the "experts." When Step-1 students read a scenario, they discard any information that does not support their version of the "truth" and cite the remaining evidence as proof they are right. These students will "stack up" evidence to support their conclusions.

Eventually, as students sort through evidence and accept only the data that supports their view, they will recognize that they are not experts and that some problems may have more than one answer. These students are now at Step 2 and can analyze the pros and cons of alternatives. In fact, these individuals are now convinced that there really is never one right answer, so they often will have trouble making a decision. A brief essay by a student at Step 2 is easily recognized by the extensive list of pros and cons of various alternatives but a refusal to choose one of the alternatives.

After sufficient practice analyzing the pros and cons of alternatives, an individual will realize that someone must eventually make a decision. When a student can finally weigh the pros and cons of the alternatives, understand underlying assumptions, and make and defend a decision, he or she has progressed to Step 3.

After a while, students at Step 3 can see that their analyses may change in the future if the environment were to change or if some underlying assumptions were violated. These students have progressed to Step 4 and can make a connection between the decision and the underlying assumptions or the decision-making environment.

At what thinking level are the MBA students in our classrooms, on average? Years of research using the SBT Model and the Reflective Judgment Model on which it was based show that students complete their undergraduate educations at just under Step 1 performance. Graduate students are, on average, approximately halfway between Steps 1 and Step 2 [King and Kitchener, 1994, p. 283]². These findings might explain why "... Practitioners sometimes are not simply biased against research, but rather inscribe their own experience into what they read ..."

²The thinking levels in the SBT and Reflective Judgment Models are numbered differently because the SBT Model covers only college-age development.

[Trank, 2014, p. 383]. These practitioners could be Step-1 thinkers that align evidence to their existing “truth.”

Any MBA class is likely to include students with a range of critical thinking skills, but most are likely to be at least at Step 1. MBA students at all levels of thinking will benefit from completing the assignment but in different ways. If there are any MBA students in the class who are at Step zero, they will observe that experts may disagree as they skim through the research articles, which can help them progress to Step 1. Erez and Grant’s [2014] suggestion about “surprising” students with research conclusions that display their inherent biases and assumptions can help students progress to Step 2, when students realize that they are not the experts, and all points of view have some validity.

To complete this assignment, students will have to weigh the merits of various research studies and determine the pros and cons of summarizing a particular article. This activity provides practice with Step-2 skills, but students also must eventually decide which article to use. The write-ups then are the students’ defense of that decision, which provides practice for Step-3 skills. In an MBA class with a large percentage of students who seem to have advanced thinking skills, a professor could request that the write-up include a discussion about how the results might change if the environment or some of the underlying assumptions changed, which would help students practice Step-4 skills.

CONCLUSION

In this paper we looked at some of the reasons for the research–practice gap. Most of the literature on this topic contains suggestions for changes scholars should make to their research to minimize this gap, and many researchers note that these changes will be difficult to make. We believe that practitioners can benefit from learning how to interpret the results from academic literature to improve decision-making, but we acknowledge the difficulties of changing management scholarship. Therefore, we raised the question: How can we transform practitioners from nontrusting and indifferent outsiders to engaged and active beneficiaries of academic research?

We presented a novel pedagogical approach that can provide MBA students with practice using academic research. Practitioners are more likely to use academic research findings in decision-making if they recognize its value and have had practice extracting relevant information from this research. Optimal decisions are likely to come from informed, rational, critical thinkers and lifelong learners. Our pedagogical idea assists students in their path toward becoming this type of decision-maker. This approach encourages practitioners to search academic publications for decision-making inputs, and it provides business school faculty with a methodology for implementation in a classroom.

Finally, this classroom assignment may have another advantage for AACSB-accredited business schools. The preamble in the AACSB 2013 standards, which

were updated in 2016, discusses the AACSB's new themes of engagement, innovation, and impact. About the theme of engagement, the preamble states:

"Effective business education and research can be achieved with different balances of academic and professional engagement. However, quality business education cannot be achieved when either academic or professional engagement is absent, or when they do not intersect in meaningful ways" [AACSB, 2017].

For maintenance of AACSB accreditation, schools need to demonstrate their ability to merge academics and practice. Training MBA students to be managers who can use academic research is one way to show this engagement.

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APPENDIX 1: COMPLETED ASSIGNMENT EXAMPLE

Citation

Erdogan, B., Bauer, T., Truxillo, D., and Mansfield, L. [2012]. Whistle While You Work: A Review of the Life Satisfaction Literature. *Journal of Management*, 38[4], 1,038–1083.

Overview

The desire to enhance employee job performance and satisfaction is a hallmark of good leadership. This article addresses the components of employee life satisfaction, how those various components can be enhanced through effective leadership, and how life satisfaction can affect your employees’ performance at

work. By extension, this research has implications for strategic management and organizational performance.

Key Points:

- Employee life satisfaction drives individual performance and commitment to the organization and can have a significant influence on business results.
- Life satisfaction is multifaceted and includes the quality of work life, the quality of life outside work [including health], and feelings of self-esteem.
- Much of what happens at work affects life satisfaction beyond just the work life component.
- Effective leaders seek to improve their employees' overall life satisfaction by shaping their work life in ways that allow them to achieve balance and meaning in their lives. This will drive greater individual performance and commitment [and, by extension, company performance and mission execution].

What the Research Shows and Why It Matters

Research by Erdogan and colleagues appearing in the *Journal of Management* is a fascinating “study of studies”, or what the researchers refer to as a meta-analysis, looking at almost 7,700 pieces of research dealing with employee satisfaction. They found that data strongly support the idea that satisfaction with *life* has tremendous spillover effects at *work*. Interestingly, the strongest correlation of all was between *career* satisfaction and life satisfaction. Career satisfaction refers to longer-term satisfaction with one's work experiences and one's optimism about career trajectory.

So, how can this help someone become a more effective, more strategic leader? It means that the most effective leaders will be those that focus on developing the “whole person” within their employees. Since life satisfaction affects individual performance at work, then improving life satisfaction for employees must be of paramount importance for leaders. As a result, managers should:

- Ensure a good fit between employees and the roles that they play in organizations so that employees' interpersonal needs and desire for recognition are met [understanding that these needs/desires vary across individuals].
- Provide opportunities for challenge, growth, and personal meaning through the employee's relationship with the organization.
- Allow flexibility with roles and schedules so that individuals can balance the conflicting demands of life.

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- Encourage employees to spend a portion of their time using their work-related skills helping others in their communities.

Leaders must be mindful of the factors driving employees to strengthen their psychological bond to the organization and achieve lasting meaning through their work.

Many leading companies are realizing this and are designing their jobs and cultures to maximize employee life satisfaction. And they're seeing outstanding results. Adobe Systems is among the leaders in this area, and their efforts at employee life satisfaction have led them to be listed on Fortune's "100 Best Companies to Work For" for over a decade. What makes them unique? They provide flexible work schedules, work-from-home opportunities, month-long sabbaticals, matching of employees' charitable contributions [up to \$5,000 per year per employee], adoption assistance services, dry cleaning pick-up, a wide variety of professional development opportunities, and tuition reimbursements. They have a unique culture, but their success isn't all about bringing a surfboard to work or having a bread machine in the office. It's about allowing people to be expressive and pursue their dreams.

In short, to achieve higher levels of employee and organizational performance, evidence from large-scale data analyses and company examples shows that leaders must focus on helping employees achieve higher levels of life satisfaction. The data show that life satisfaction is driven by multiple aspects of work, including work's ability to fulfill interpersonal, financial, and status needs; challenge the mind; and provide opportunities for a brighter future.

Comparison of Professional Leadership Program Content to University Leadership Programs

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Is there any connection between leadership offerings available to the audience for professional development programs versus university M.B.A. programs? This paper examines the top professional leadership programs on the market and the top leadership M.B.A. programs in colleges and universities, comparing the topics and content offered in workshops/seminars with the subjects taught in university courses. The number of courses and the subject matter of each program is examined to determine how much overlap exists, if any, as a first step in recommending ways to better meet the needs of the future professional environment in M.B.A. leadership programs.

Keywords: Leadership Programs, Leadership Content, M.B.A. Leadership Courses

Disciplines of Interest: Leadership, Ethics, Management, Marketing

INTRODUCTION

Leadership is a growing area of interest for both universities and businesses. According to Richard Greenwald [2010], leadership programs are growing in colleges and universities, and this growth is expected to continue as leadership and the opportunities for leadership continue to be areas of emphasis in both the academic and business communities. The topic of business leadership has been researched in many ways. A number of studies discuss the history and theory of leadership [see Sydänmaanlakka, 2003, for a comprehensive review] as well as leadership styles [Lewin, Lippit, and White, 1939 (autocratic, democratic, laissez-faire); Blake and Mouton, 1964 (managerial grid); Vroom, 1964, Evans, 1970, House, 1971, House and Mitchell, 1974, Stogdill, 1974, Northouse, 2013 (path-goal theory); Goleman, Boyatzis, McKee, 2002 (emotional leadership styles); Flamholtz and Randle, 2007 (leadership style matrix); Burns, 1978, Bass, 1985,

Content Comparison of University M.B.A. versus Professional Leadership Programs.

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Bono and Judge, 2004 (transactional and transformational leadership); Weber, 1958 (bureaucratic leadership); Conger and Kanungo, 1994 (charismatic leadership); Greenleaf, 1970 (servant leadership)]. One can also find many popular “how-to” leadership books as well as biographies of great leaders at any bookstore. With this growing interest in developing leaders, many universities have placed more emphasis on developing leadership programs for students, most of which are at the M.B.A. level. Simultaneously, many professional programs and workshops have emerged also aimed at leadership development. This increase in programs raises the question of how these university-based leadership programs differ from professional programs, if at all, and why the market for professional programs exists and continues to grow.

As universities increase offerings in leadership training and education, one of the most prevalent questions centers on what the content of these programs actually entails. Answering this question requires an understanding of the content of university leadership courses and programs. The answer also necessitates a review of what content is involved in leadership programs offered by independent companies for professional developmental opportunities for new and existing employees in the marketplace. This study seeks to identify the content that is involved in university leadership programs and professional developmental leadership workshops, and what correspondence, if any, exists.

PROGRAM CONTENT

Study

This study focuses on university-based M.B.A. leadership programs that are offered as full degree programs. The study excludes executive-style, university leadership seminars because the research question largely focuses on why professional development programs are necessary if full leadership degree programs prepare students adequately. The study did not differentiate professional programs based on delivery method because these programs serve a different purpose than university leadership degree programs.

Additionally, the study does not consider depth of content coverage or length of workshop or class. The study does not consider one M.B.A. class versus multiple professional workshops, again, because it focuses on subject-matter comparison only. Finally, the study does not consider course outcomes or objectives, again, as it focuses on subject matter only.

Data Sources

The research began with a review of the top M.B.A. programs that have a concentration/specialization in leadership as ranked by Quacquarelli Symonds TopMBA. The researchers selected Quacquarelli Symonds TopMBA because of

the company's focus on connecting graduate business education and executive professional communities and networks. The original list named 50 university programs throughout the world. Because most of the professional programs originate in the United States, the M.B.A. list was narrowed to the top university programs in the United States, resulting in 21 programs. Of those programs, two were executive M.B.A. programs instead of full-term programs; thus, they were excluded from consideration due to the nature of the class structure. The executive M.B.A. programs consisted of mini seminars that were more like the professional-program offerings than regular university courses and series of speakers. Because there was a difference in the way the semester M.B.A. versus the executive M.B.A. courses were conducted, the researchers did not want those differences to skew the data. Once the academic programs were determined, the content of each program as it pertains to leadership was reviewed.

To determine professional developmental leadership programs' content, the researchers first reviewed companies listed by Training Industry in the Top 20 Professional Leadership Programs. The researchers chose Training Industry's list of programs because of the company's established leadership in the professional workforce training market with a weekly newsletter with over 50,000 subscribers, and the company's thoroughly collated list of training programs by various topics and skill areas. From this list, each professional program's leadership courses were reviewed to determine the overall content included in these offerings.

M.B.A. Programs

The top 19 M.B.A. leadership programs in the United States, according to <http://www.topmba.com> [2016] are: Harvard Business School, The Wharton School (University of Pennsylvania), Stanford University, Columbia Business School (Columbia University), Northwestern University, Chicago Booth School of Business (University of Chicago), Sloan School of Management (Massachusetts Institute of Technology), Tuck School of Business (Dartmouth College), UCLA Anderson School of Management (University of California, Los Angeles), Ross School of Business (University of Michigan), Yale School of Management (Yale University), Kenan-Flagler Business School (University of North Carolina), Haas School of Business (University of California Berkeley), NYU Stern School of Business (New York University), Darden School of Business (University of Virginia), Samuel Curtis Johnson Graduate School of Management (Cornell University), Thunderbird School of Global Management, School of Management at Boston University, and The Fuqua School of Business (Duke University).

One researcher independently reviewed these programs' content and found 37 topics related to leadership in the M.B.A. programs. Content topics found in the M.B.A. programs are found in Table 1.

Table 1. MBA Program Content Topics

<ul style="list-style-type: none">● Decision-making/analysis/critical thinking● Negotiation skills● Financing the organization/resource development● Global expansion/management● Communication skills● Personal leadership plan (personal goals, strengths/weaknesses, vision)● Leading teams/teams/team performance● Change management● Conflict Management/resolution● Employee performance● Management/accountability● Empower/engage employees/delegation● Influencing/motivating others/power/politics● Understanding/managing diversity/different personalities/human capital● Female leadership● Emotional intelligence/self-awareness	<ul style="list-style-type: none">● Coaching employees● Succession planning● Coaching virtual/distance employees● Assessing/creating organizational culture/organizational design● Leading virtual teams● Developing team/leadership trust/interpersonal dynamics● Multiple generations in workplace● Sustainability● Ethics/corporate social responsibility● Transformational leadership● Listening skills● Organizational alignment with vision● Corporate governance● Career management● Contextual intelligence● Leading different types of firms (industries)● Operations management● Leadership styles● Crisis management● Networkin● Align people and processes
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Professional Leadership Programs

Training Industry's Top 20 Professional Programs are: Harvard Executive Education, VitalSmarts, Center for Creative Leadership, Skillsoft, Wilson Learning, Forum, ZengerFolkman, FranklinCovey, Linkage, CrossKnowledge, HemsleyFraser, Development Dimensions International, American Management Association (AMA), Richardson, Ken Blanchard, Interaction Associates, and MHI Global. Three additional programs did not provide any program or workshop content information and/or did not focus on leadership skills, including Impact International and Global Knowledge.

A second researcher independently reviewed these programs' content and found 41 topics in the professional leadership programs. Content topics found in these programs are found in Table 2.

Table 2. Professional Program Content Topics

<ul style="list-style-type: none">● Strategy● Innovative thinking● Global expansion● Decision making/analysis/critical thinking● Negotiation skills● Sales alignment with organization strategy● Organization performance measures● Financing the organization/resource development● Communication skills● Personal leadership (personal goals)● Leading teams● Change management● Conflict management/resolution● Employee performance management● Delegation● Influencing/motivating● Understanding/managing diversity/different personalities● Female leadership● Emotional intelligence/self-awareness	<ul style="list-style-type: none">● Coaching employees● Succession planning● Coaching virtual employees● Consulting processes● Assessing/creating organization culture● Project planning/management● Leading virtual teams● Building learning organizations● Human resources selection process management● Front-line management/leadership● Developing trust● Multiple generations in the workplace● Matrix organization leadership● Personal stress management● Marketing for non-marketers● Personal productivity/time management● Meeting management● Advancing to senior management● Sustainability● Ethics● Transformational leadership● Listening skills
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Combined Program Content

During the review of content from both the academic and professional leadership programs, the subjects list was compared. Identical topics were kept on the list as is. Remaining topics were discussed as to content and combined, if appropriate, based on mutual agreement between the researchers. Topic areas for which only one program had the subject were also kept. The researchers reviewed the data to refine the initial list of 78 content topics to a more concise list of 25 topics that accurately reflected overlap. The refined and final list of program topics are found in Table 3.

Table 3. Refined and Final List of Program Topics

<ul style="list-style-type: none">● Strategic Planning● Innovative Thinking● Decision-Making/Critical Thinking● Negotiation Skills● Alignment● Global Management● Communication Skills● Self-Evaluation/Career Planning● Teams● Change Management● Conflict Management/Resolution● Human Resources Issues● Diversity Issues● Influencing/Motivating others/Power/Politics	<ul style="list-style-type: none">● Female Leadership● Assessing/Creating Organizational Culture/Organizational Design● Productivity● Sustainability● Ethics/Corporate Governance● Transformational Leadership● Contextual Intelligence● Leadership Styles● Leading Different Types of Firms (Industries)● Operations Management● Crisis Management
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ANALYSIS OF THE CONTENT FOR PROGRAMS

Both the M.B.A. and professional leadership programs were assessed by finding the average number of times that a subject area was listed in each program area. The researchers were interested in determining the most frequently listed subject areas, reasoning that topics that are included in the majority of the programs should be more relevant content for leadership programs.

In the M.B.A. programs (Table 4), content associated with teams appeared most frequently. Strategic planning, ethics/corporate governance, decision-making/critical thinking, communication skills, and influencing/motivating others/power/politics followed closely behind.

Table 4. M.B.A. Program Content Findings Listed by Topic, Number of Programs Containing the Topic, and the Percentage of Programs Containing the Topic

Teams	20	95%	Change Management	13	62%	Crisis Management	7	33%
Strategic Planning	18	86%	Leadership Styles	13	62%	Leading different Types of Firms (Industries)	6	29%
Ethics/Corporate Governance	17	81%	Global expansion/Management	11	52%	Innovative Thinking	5	24%
Decision-Making/Critical Thinking	16	76%	Assessing/Creating organizational culture/Organizational design	11	52%	Female leadership	4	19%
Communication skills	16	76%	Human Resource Issues	10	48%	Sustainability	3	14%
Influencing/Motivating others/power/politics	16	76%	Conflict Management/Resolution	8	38%	Transformational Leadership	1	5%
Self-Evaluation/Career Planning	15	71%	Alignment	7	33%	Contextual Intelligence	1	5%
Operations Management	15	71%	Diversity Issues	7	33%	Productivity	0	0%
Negotiation Skills	13	62%						

Table 5. Professional Leadership Content Findings Listed by Topic, Number of Programs Containing the Topic, and the Percentage of Programs Containing the Topic

Teams	15	88%	Change Management	11	65%	Crisis Management	0	0%
Strategic Planning	11	65%	Leadership Styles	0	0%	Leading different types of firms (industries)	5	29%
Ethics/Corporate Governance	1	6%	Global expansion/Management	2	12%	Innovative Thinking	10	59%
Decision Making/Critical Thinking	5	29%	Assessing/Creating organizational culture/Organizational design	4	24%	Female leadership	3	18%
Communication skills	13	76%	Human Resource Issues	16	94%	Sustainability	1	6%
Influencing/Motivating others/power/politics	8	47%	Conflict Management/Resolution	9	53%	Transformational Leadership	1	6%
Self-Evaluation/Career Planning	14	82%	Alignment	4	24%	Contextual Intelligence	0	0%
Operations Management	3	18%	Diversity Issues	6	35%	Productivity	3	18%
Negotiation Skills	7	14%						

In the professional leadership programs (Table 5), content associated with human resources management issues appeared most frequently. This content primarily focused on managing the selection process and coaching employees. Leading teams; managing one's own career, productivity, and time; and communication skills followed closely.

Comparison of Academic and Professional Program Content

Following the individual program content assessment, the study reviewed the combined data for topic comparison. The findings are listed in Table 6.

DISCUSSION

These findings indicate clear parallels between M.B.A. and professional programs on five topic areas: leading teams, the need for effective communication skills, self-management and career planning, strategic planning, and managing change. In assessing the differences between professional and M.B.A. programs beyond those five topics, human resources management issues appear to be most important to professionals attending leadership workshops, whereas ethics and corporate governance appear to be most important in university programs.

The second tier of agreement between professional and M.B.A. programs includes human resource issues, influencing/motivating others/power/politics, and negotiation skills. Although the types of programs did not agree on how important each topic is to leadership, at least one-third of either the M.B.A. or the professional programs included those topics, whereas at least one-half of the other programs (M.B.A. or professional) included the topic.

The third tier of assessment includes topics that were relevant to either the M.B.A. programs or the professional programs, but not both. For this tier, at least 50 percent of one of the programs included the topic, but less than 30 percent of the other

Table 6. Combined Comparison Data

	Professional		Academic	
M.B.A. & Professional Program Agreement at 50% and Above				
Teams	15	0.882352941	20	0.952380952
Communication skills	13	0.764705882	16	0.761904762
Self-Evaluation/Career Planning	14	0.823529412	15	0.714285714
Strategic Planning	11	0.647058824	18	0.857142857
Change management	11	0.647058824	13	0.619047619
M.B.A. & Professional Program Disagreements at 50% and above for One Program, but above 30% for the Other Program				
Human Resource Issues	16	0.941176471	10	0.476190476
Influencing/Motivating others/power/politics	8	0.470588235	16	0.761904762
Negotiation Skills	7	0.411764706	13	0.619047619
M.B.A. & Professional Program Disagreements at 50% and above for One Program, but below 30% for the Other Program				
Ethics/Corporate Governance	1	0.058823529	17	0.80952381
Decision-Making/Critical Thinking	5	0.294117647	16	0.761904762
Operations Management	3	0.176470588	15	0.714285714
Leadership Styles	0	0	13	0.619047619
Innovative Thinking	10	0.588235294	5	0.238095238
Conflict Management/Resolution	9	0.529411765	8	0.380952381
Global expansion/management	2	0.117647059	11	0.523809524
Assessing/Creating organizational culture/Organizational design	4	0.235294118	11	0.523809524
M.B.A. & Professional Programs Below 50% for Both				
Diversity Issues	6	0.352941176	7	0.333333333
Alignment	4	0.235294118	7	0.333333333
Crisis Management	0	0	7	0.333333333
Leading different types of firms (industries)	5	0.294117647	6	0.285714286
Female leadership	3	0.176470588	4	0.19047619
Productivity	3	0.176470588	0	0
Sustainability	1	0.058823529	3	0.142857143
Transformational Leadership	1	0.058823529	1	0.047619048
Contextual Intelligence	0	0	1	0.047619048

programs included the topic. These topics include ethics/corporate governance, decision-making/critical thinking, operations management, leadership styles, innovative thinking, conflict management/resolution, global expansion/management, assessing/creating organizational culture/organizational design. It is interesting that M.B.A. programs place a much greater significance on ethics and corporate governance, whereas professional programs do not cover this topic (only 1 in 20 programs).

The fourth tier of assessment includes topics that appear to be peripheral to the subject of leadership for both the M.B.A. and the professional programs. These topics were included in less than 35 percent of all programs, and include diversity issues, alignment, crisis management, leading different types of firms (industries), female leadership, productivity, sustainability, transformational leadership, and contextual intelligence. It is interesting to note that despite increased public scrutiny of workplace diversity and female leadership, these two topics constitute about one third and one fifth of the course content in both university and professional programs, respectively. The tiers used were based on breaks found naturally occurring in the data.

FUTURE RESEARCH

The research indicates an overlap between M.B.A. and professional programs in some topic areas related to leadership, and many other topic areas covered in varying frequency in each program. The reasons for these differences are not apparent and were not assessed in this study, but one could hypothesize that the professional programs may be necessary to supplement leadership training in businesses for employees who did not receive an advanced education and may also provide opportunities to gain the continuing education credits that are required by many professions. The reasons for these differences should be considered in future research.

This study centers on the actual needs of employers and potential employees in terms of leadership. Future research should consider the following questions: Is the variance between university and professional leadership program content largely based on needs that are not met through university programs that must be supplemented later by professional development activities? Is the difference largely built around continuing education requirements in the workforce? If so, why does greater content overlap not exist in the programs? Are graduates of university leadership programs well prepared to meet the workplace challenges associated with the university programs' content areas? What, exactly, is being taught in university classes and workshops that may lead to greater correlation or variance in topic areas with significant overlap?

Another consideration is related to professional programs' placing a greater emphasis on human resource management issues. What is the cause of this? Given the small overlap between programs' content, what conversations need facilitation to ensure more accurate coverage of workplace needs in M.B.A. leadership programs? Perhaps the difference between program content centers largely on theory versus application, such that once M.B.A. graduates enter the workforce, they need or demand greater practice in hands-on application of theory learned in academic programs. The data indicate that M.B.A. programs sufficiently address ethical concerns, which is not surprising given the increased emphasis placed on this content in various business schools since the Enron scandal in the early 2000s. If similar emphasis were placed on other content areas emphasized in professional training programs, would this change reduce demand for those programs? These and other questions will be addressed as part of future research on this topic.

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Service Learning: Value-Added Evidence in the Finance Course

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Within business education, the finance discipline stands out as significantly lacking in service-learning research. This paper provides qualitative and quantitative evidence on the use of service learning in the finance course in the School of Business at a small, private, urban university. On the postservice learning evaluation, the largest impact was in the student's attitude to service, the value of future service work, and involvement in the community. Reflection papers supported the positive attitude change toward the benefits of service and the desire to participate in service work in the future.

Keywords: Finance, Service Learning, Experiential Learning

Disciplines of Interest: Finance, Service Learning

INTRODUCTION

The idea of community service and civic engagement in higher education has a long history, beginning in the 19th century and continuing today [National Service-Learning Clearinghouse, 2008]. Within the realm of business education, service learning is a relatively recent integration, and published research in certain business disciplines is rare to nonexistent. Specifically, the finance discipline stands out as significantly lacking in service-learning research. In a detailed search of service-learning applications in business, Andrews [2007] found only one application in finance. In this article, we provide a brief overview of the use and benefits of service learning in general and in business programs and finance courses specifically. We then describe a service-learning project developed and used by the School of Business of a small, private, urban university, including qualitative and quantitative evidence that service learning helps to meet learning outcomes.

SERVICE LEARNING

Service learning has been described in a variety of ways. Service learning was defined as “a course-based, credit-bearing, educational experience in which students participate in an organized service activity in such a way that meets

identified community needs and reflect on the service activity in such a way to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility” by Bringle and Hatcher [1996]. Rose, J.M., Rose, A.M., and Norman [2005] similarly defined service learning as projects designed to support both specific-learning objectives and benefit the business community. Gujarathi and McQuade [2002] identified five factors that are essential for a successful service-learning assignment. First, the university must incorporate service learning as an integral part of its mission statement with a positive commitment to service learning at all levels in the university. Second, a working relationship must be developed with the community agencies that will be affiliated with the service-learning program. Third, the importance of the community service-learning program must be established. Fourth, the faculty and students must be motivated by the service-learning program. Fifth, a clear connection between the assignment in the service-learning program, and the skills and topics that are covered in the related university course must be established.

Godfrey, Illes, and Berry [2005] felt that reflection was a critical component of the effectiveness of a service-learning program. The idea was that reflection would force the participating students to think deeply and write about how the service-learning experience affected them on a personal level as well as how the community agency involved in the program was affected. This reflection should be from an emotional, rather than analytical, perspective. The questions should be based on how the student is different after the experience and what they felt was learned, rather than what should be done differently next time. The students should be able to make direct correlations between their service-learning experiences, their related coursework, and their personal lives. Connors and Seifer [2005] also felt that structured critical reflection was important to the success of a service-learning program. They felt the reflection is also a means of assisting in making the connection between the service experience and the learning experience.

SERVICE LEARNING IN BUSINESS PROGRAMS AND FINANCE COURSES

The application of service-learning programs in business schools has been fairly recent. Historically, service-learning assignments were primarily restricted to the social sciences and liberal arts. Therefore, published research in certain business disciplines is very limited. However, universities, particularly business schools, are in a unique position to provide valuable service to community organizations by assisting them in business operations. At the same time, the business students gain an enhanced overall learning experience and are able to visualize better how their course-related material relates to the real world. The students also gain an enhanced sense of civic responsibility [Gujarathi and McQuade, 2002]. Manning [2012] felt that the incorporation of service learning

offered an approach for business schools to reinforce and increase students' civic values as well as their emotional intelligence insights and skill development. Poon, Chan, and Zhou [2011] also felt that service learning provides opportunities for students to learn about civic and social issues and responsibilities and to develop interpersonal, communication, and leadership skills, with a focus on community service. They felt that universities would also benefit from an enhanced social responsibility and commitment image and a greater link to their communities.

Although business schools may have been slower than the social sciences and liberal arts disciplines in adopting the use of service learning in the curriculum, Govekar and Rishi [2007] felt that they are increasingly interested in developing more real-world experiences for students. They felt that this interest is due to increasing complexities of the global economy, which require managers to possess the ability to apply academic skills to practical settings, to develop problem-solving ability and teamwork skills, and to enhance their ability to understand multiple viewpoints. The skills learned from participation in service-learning projects will better prepare students for roles as responsible and effective leaders with a sense of civic value. However, the accounting and finance sections of the business discipline appear to be particularly lacking in the use of service learning in academia. Limited literature on the use of service learning projects in accounting or finance courses in universities exists.

According to Gujarathi and McQuade [2002], the desire by accountants, both in the profession and in academia, to incorporate an active-learning aspect in the accounting curriculum is evidence of the need for service-learning programs in the business field, specifically the accounting and finance professions. The finance discipline in particular stands out as significantly lacking in service-learning research. In a detailed search of service-learning applications in business, Andrews [2007] found only one application in finance. Dahlquist [1998] provided a description of a service-learning project that was developed for a senior-level finance seminar course taught at a private liberal arts university. Students were divided into teams and were required to take on the task of developing a loan process for a local nonprofit organization. After developing the loan process, including preparation of sample forms, the student teams made presentations to the board of directors of the nonprofit organizations.

SERVICE-LEARNING EXPERIENCE: SCHOOL OF BUSINESS

An emphasis on service has been a part of the mission of the University since its founding in 1814. The University actively encourages all members of the academic community to participate in their larger community and to offer learning experiences beyond the classroom. According to the *University Catalog* [2013], service learning is defined as "a cooperative venture of academic study and community service through which students can be helpful in a community setting

while gaining concrete career skills, work experience, and, possibly, academic credit.”

In spring 2007, the School of Business was given a specific charge to determine how to incorporate service learning into the Business Administration and Accounting degree programs. At that time, the Chair and a faculty member in the School of Business were volunteering in Junior Achievement [JA] Chase Finance Park, which provides a practical, hands-on personal budgeting simulation for middle-school students. The students immerse themselves in reality-based decision-making in areas such as housing, investments and banking. JA was contacted about the possibility of college student participation, and the idea was received very positively. Because of the nature of Chase Finance Park, it was decided to incorporate service learning into the business finance course, a required course in both the Business Administration and Accounting degree programs. For the service learning to fit into student schedules, students volunteered on one Friday during the course because there are no scheduled classes on Fridays. To provide the most benefit to JA, the instructor contacted JA to determine the Fridays with the most need for volunteers. Students could either choose a Friday when the instructor would be there [preferable], or other Fridays as long as they provided attendance verification. In spring 2008, the first time the project was required, the schedule for the day at Finance Park was explained to the students prior to volunteering. The students then spent a day [8:30 a.m. to 1:30 p.m.] at Finance Park assisting seventh graders in the preparation of their budgets. Students worked with anywhere from six to twelve students. Once the student's service-learning experience was complete, a reflection paper was required.

After instructor observation of this first interaction at Finance Park, changes were made in the presentation of the project for the spring 2009 offering of the course. The instructor received permission from JA to use the actual budget paperwork from Finance Park with the students. In class, the students went through the entire Finance Park activity. Having the students complete the project before going to JA gave them a better understanding of the project and an awareness of areas in which the middle-school students might tend to make mistakes in their budgets. This enhancement was confirmed in spring 2009 by instructor observation of a much-improved interaction between the college students and middle-school students at Finance Park. Also, in 2009, pre- and postservice learning evaluations, as well as a rubric to assess the reflection papers, were added.

MEASUREMENT AND DATA ANALYSIS

Data collection began in spring 2009 and ended in spring 2013. A total of 62 business and accounting majors have participated in the study over this five-year period. These students were full-time students in the traditional day program.

Two measurement tools were used to assess the service-learning activity. First, a preservice-learning evaluation and a postservice-learning evaluation were

added to measure students' attitudes toward service-based activities. The pre- and postservice-learning evaluations were adapted from precourse and postcourse student surveys used by the University of San Francisco Leo T. McCarthy Center for Public Service and the Common Good [www.usfca.edu/templates]. Second, a previously developed rubric [www.compact.org] to assess service-learning reflection papers was revised to measure the students' reflection papers.

Data analysis of the preservice-learning and postservice-learning evaluations included a descriptive analysis of the findings and *t*-tests to determine if any significant differences in student attitudes occurred before and after service-learning participation. Data analysis of the student reflection papers included: 1] reporting of the percentage rated as "distinguished" across the five rubric categories and 2] examining the student reflection papers qualitatively for themes across each category of the student reflection paper rubric.

SERVICE-LEARNING PROJECT RESULTS

Preservice Learning and Postservice Learning Evaluation

Overall, the students were highly service oriented prior to participating in the service-learning project in business finance. As shown in Table 1, 97 percent of the students, both pre- and postevaluation believed that most people can make a difference in their community. Also, 95 percent of the students before service hoped that the community work in the course would benefit the community, increasing slightly to 97 percent post service. Further analysis of each statement on the pre- and postservice-learning evaluation uncovered eight attitude changes worth noting. First, post service, a larger percentage of students either agreed or strongly agreed that the community aspect part of the course revealed how to become more involved in their community, and students thought the idea of combining community work with coursework should happen more often at the university. Further, post service, a larger percentage of students thought the community work made them more marketable in their profession, more comfortable working with other cultures, and more skilled in group work. Second, post service, a smaller percentage of students either agreed or strongly agreed that the service work helped with increased understanding of lectures and readings in the course or helped them clarify their own strengths and weaknesses.

As can also be seen in Table 1, of the changes in attitude, only three statistically significant positive changes in attitude were found. First, after service, on average more students thought community service and coursework should be combined in more classes at the university [$t = -2.37$, p -value = 0.02]. Second, post service, on average more students saw how they could become more involved in the community [$t = -2.44$, p -value = 0.02]. Finally, post service, on average more students felt they have a responsibility to serve their community [$t = -1.81$, p -value = 0.07].

Table 1. Difference in Mean Values between Pre-Service Learning and Post-Service Learning

Statement	Pre-Service		Post-Service		t-test
	A/SA*	μ	A/SA*	μ	
Helped see how subject matter can be used in everyday life.	87%	4.16	91%	4.13	0.80
Helped better understand lectures and readings in course.	72%	3.81	65%	3.65	0.38
Idea of combining work in community with University coursework in more classes.	57%	3.48	78%	3.95	0.02
How can become more involved in my community.	75%	3.91	93%	4.2	0.02
Benefited the community.	95%	4.33	97%	4.30	0.77
Feel have responsibility to serve my community.	70%	3.69	76%	3.98	0.07
Helped define personal strengths and weaknesses.	72%	3.87	69%	3.87	0.99
Helped define profession I want to enter.	43%	3.26	26%	2.96	0.09
Should make me more marketable in my profession.	71%	3.80	80%	3.87	0.66
Most people can make a difference in their community.	97%	4.32	97%	4.4	0.46
Comfortable working with other cultures.	86%	4.16	93%	4.33	0.20
Enhance leadership skills.	85%	4.13	85%	4.13	0.99
Enhance ability to communicate in real world context.	87%	4.13	84%	4.13	0.99
More skilled in group work.	84%	4.03	92%	4.13	0.48

*Percentage agreed or strongly agreed with each statement.

One statistically significant change resulted in a lower average rating post service. Specifically, post service, on average fewer students thought that the service work helped them to define the profession they want to enter after graduation [$t = 1.69$, p -value = 0.09].

Student Reflection Paper Results

As can be seen in Table 2, the percentage of students rated as “distinguished” across five rubric categories varied from year to year. On average, across the five years of data, the largest percentage of students [89 percent] demonstrated in their reflection papers an awareness of the purpose of the service-learning project. Comments such as, “I feel like I have helped someone see what the future brings them, . . .” and “At the end of the day I felt good about going there and about helping the kids learn a little about what is in store for them in the future, whether they are excited to have to pay bills or not” support the ratings.

Second, 87 percent of students acknowledged a responsibility to the community. As one student pointed out, “After doing this service project I can definitely

Table 2. Percentage of Students Rated as Distinguished across Five Rubric Categories

Rubric Category	Average %	2009	2010	2011	2012	2013
Awareness of Purpose	89%*	80%	75%	0%	100%	100%
Apply Theory to Service Learning	75%*	80%	75%	0%	83%	62%
Responsibility to Community	87%*	85%	81%	0%	83%	100%
Impact on Personal Life	83%	90%	100%	75%	83%	69%
Critical Thinking	73%	80%	88%	50%	83%	62%

*Average percentage without outlier of 0%.

say that I would do it again if I had the opportunity. Doing service is a vital part of society in today's world and if we didn't have people that were willing to sacrifice time and effort then the world would be in a lot worse shape than it is." For some students, an attitude shift toward serving the community occurred, as one noted: "I am so glad that I got to participate in a volunteer activity at Finance Park. This really opened my eyes to how fulfilling community work can actually be."

Third, 83 percent of students were able to articulate the impact that participating in the service-learning project could or did have on their personal lives. As clearly stated by one student, "Volunteering at Finance Park and working with middle school kids really made me look back and think about where I came from and how I got to this point in my life, who has helped me in the past and how I can give back to others the same privilege that was granted to me."

Other themes emerged in the "impact on personal life" rubric category, including the teacher/student dynamic, the earning of respect, the development of patience, and future service plans. Regarding the teacher/student dynamic, for some students this project was the first time they were in a "teacher" role. Comments included "I have a newfound respect for teachers", "I felt like a teacher and that I accomplished something," and "My interaction with the students was the best part of the whole day." Along with the teacher/student dynamic, the business finance students discovered that patience is an important part of being a teacher. One student specifically stated, "Patience is something I developed while I was there." Another student walked away from the experience stating, "I have learned to be more patient with others, to not get frustrated when I have to explain things a few times, and that we are all different and do not learn the same way."

Regarding earned respect, one student stated, "The kids really looked up to me and I felt a sense of importance that they in some way idolized me and wanted to be like me when they were older." Another student openly admitted to not feeling like a good leader, stating "I know that personally I am not the best leader and leading young kids can be even more difficult. . . . At the end of the day I had their respect, and they had mine."

Finally, regarding future plans, students used this experience to think about specific ways to serve their community. For example, one student said, "I plan on joining some organizations at school so I can start helping build the community around my school." Another stated, "I think future classes should do the Junior Achievement project, . . . it helps build character. . . . At the very least the experience at Junior Achievement will help keep me focused on my own goals and should inspire me to continue to do volunteer service."

Fourth, 75 percent of students used their own perspectives based on both theory and service and applied it beyond the curriculum. For example, one student stated, "I enjoyed sharing what I have learned with the students and helping them have a better understanding of finance." Another added, "It is a good opportunity to reinforce economic concepts and learn management skills over a group."

Finally, 73 percent of students used critical thinking to express an abstract level of responding to the service-learning experience in their reflection paper. Critical thinking is measured as part of the student reflection-paper process to determine whether or not the students are using evidence from their experience to demonstrate awareness of purpose, the application of theory to the service, a responsibility to the community, and the impact on their personal lives. Critical thinking had the lowest average percentage rating [73 percent rated distinguished] across the five years of data collection. Some statements reflected a higher level of analysis: "This experience definitely helped me to understand that it is our duty as a community to help each other out to not only better ourselves but to better our state, country and world as a whole." Another noted, "In a world of business that is often characterized by self-achievement and selfish pursuits, I want to be a part of those that aim for something greater than an impressive bottom line."

Also, regarding overall student reflection-paper results, one additional theme existed. The college students were very skeptical of working with middle-school students, but once they realized that the middle-school students looked up to them and appreciated their help, the skepticism turned to excitement. As one business finance student said, "I was a little nervous, but anxious at the same time about the experience. I have never been involved with service work that involves young kids . . ."; at the end of the experience, another student stated, "Junior Achievement was an eye opener for me. I actually felt honored to be helping all the students out."

CONCLUSION AND RECOMMENDATIONS

Based on these findings, overall, we feel this project has been a beneficial addition to the business finance course and to the School of Business. The students are able to take concepts learned in the class dealing with budgeting and apply that on a personal level for themselves by completing the budget exercise in class. They also experience the impact the exercise has for the JA participants. The

leadership roles that they take at JA help our students look at the budgeting exercise from a different perspective.

There may not have been as many significant differences in the pre- and postservice-learning evaluation because our students were more service oriented prior to the finance class. Service is stressed at the University, starting with first-year student orientation. The most significant impact, post service, for the students was in their attitudes to service as a class requirement, and the value of future service work and involvement in the community.

The reflection paper, along with the discussion in the classroom, reflected a difference in attitudes toward service. Prior to participating, the students were concentrating more on how the JA participants would behave and react to them. After participating, the discussion and the paper were centered more on the positive benefits of service and the desire to do something like that again, especially with younger students. Our students saw the value of the contributions they made at JA and translated that into the possibility of future volunteer work and civic responsibility.

The only recommendation would be to have the students write a short paper on their thoughts about service in general and their future JA service at the beginning of the class, along with the preservice survey. This modification would offer a better insight into any changes in attitude toward service that are now seen more thoroughly in the class discussions.

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