# JOURNAL OF THE ACADEMY OF BUSINESS EDUCATION

**VOLUME 20** 

CONTENTS

**WINTER 2019** 

223	Essential Learning Outcomes: Self-Reports from Business and Non-Business Majors by Maureen Snow Andrade, Ronald Mellado Miller, and Morgan Ogden									
254	<b>Engaging Students through Activity Design: A Service-Dominant Logic</b> <b>Perspective</b> by Jack Smothers, Alyssa Moore, Jeanette Maier-Lytle, Dinko Bačić, Manfen W. Chen, and Kevin Celuch									
277	Using the ETS Major Field Test in Business to Predict MBA Performance by Thomas A. Timmerman									
287	<b>Budget Habits of College Students: An Empirical Analysis of</b> <b>Expectations and Realizations</b> by James C. Brau, Marshall Ringwood, and Jessica West									
309	<b>Problem-Based Learning: Executive-Led Cases In Finance Seminars</b> by Linda Gibson, Bruce Finnie, and Catherine Pratt									
335	<b>Enhancing Team Learning Experiences in the Classroom</b> by Jane D. Parent, Allison Seitchik, Kathi J. Lovelace, and Christina Hardway									

355 Business Communication Courses: Do They Make A Difference In Writing Skills? by Dennis Bline and Xiaochuan Zheng

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# Journal of the Academy of Business Education

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- 223 Essential Learning Outcomes: Self-Reports from Business and Non-Business Majors by Maureen Snow Andrade, Ronald Mellado Miller, and Morgan Ogden
- 254 Engaging Students through Activity Design: A Service-Dominant Logic Perspective by Jack Smothers, Alyssa Moore, Jeanette Maier-Lytle, Dinko Bačić, Manfen W. Chen, and Kevin Celuch
- 277 Using the ETS Major Field Test in Business to Predict MBA Performance by Thomas A. Timmerman
- 287 Budget Habits of College Students: An Empirical Analysis of Expectations and Realizations by James C. Brau, Marshall Ringwood, and Jessica West
- **309 Problem-Based Learning: Executive-Led Cases In Finance Seminars** by Linda Gibson, Bruce Finnie, and Catherine Pratt
- **335 Enhancing Team Learning Experiences in the Classroom** by Jane D. Parent, Allison Seitchik, Kathi J. Lovelace, and Christina Hardway
- 355 Business Communication Courses: Do They Make A Difference In Writing Skills? by Dennis Bline and Xiaochuan Zheng

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### **Essential Learning Outcomes: Self-Reports** from Business and Non-Business Majors

#### Maureen Snow Andrade, Ronald Mellado Miller, and Morgan Ogden

Utah Valley University, Utah Valley University, House of Hope

Higher education graduates must be well-versed in skills that cut across disciplines, such as critical thinking, communication, and problem solving. Employers highly value these skills and may view them as more important than the major with which a student graduates, yet recent college graduates have failed to meet employer expectations. This comparison study examined the value and impact of learning outcomes for business and non-business majors as evidenced through an institutional survey of graduating students. While both groups had generally positive views about acquiring cross-cutting learning outcomes (e.g. critical thinking, communication, interpersonal skills, ethics, preparation for real-world problems, leadership/teamwork, and diversity), findings indicated several significant differences. Graduating business majors were more likely to indicate attaining job-focused skills, leadership/management skills, math skills, and completing an internship, whereas non-business majors experienced greater growth in art and culture and community and civic involvement.

 Keywords: Cross-Cutting Skills, Essential Learning Outcomes, Business Majors
 Disciplines of Interest: Higher Education, Business Education, Business and Management, All Non-Business Disciplines

#### INTRODUCTION

Graduates from institutions of higher education need the ability to explore complex issues from a variety of perspectives and address them in innovative ways [Association of American Colleges & Schools (AAC&U), 2015; Schneider, 2015]. They must be well-versed in skills that are applicable across disciplines,

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such as critical thinking, communication, and problem solving. Employers highly value these skills and may view them as more important than the major with which a student graduates [AAC&U, 2011; Hart Research Associates, 2015]. These desired learning outcomes, identified by employers, professional accrediting bodies, and higher education faculty [AAC&U, 2015], are critical to success in today's rapidly changing and high-tech environment.

Accreditation standards for the Association to Advance Collegiate Schools of Business (AACSB) require assurance of student learning. Institutions can meet this standard through both direct and indirect measures [AACSB, 2013]. Assessment endeavors must be led by faculty who collaborate on determining measures, set specific action plans to address deficiencies identified as the result of assessment, and implement needed curricular or pedagogical changes [Miles et al., 2014]. Schools with AACSB accreditation are recognized internationally due to the assurance that they have met required standards of quality and are committed to continuous improvement [Wilson and Thomas, 2012].

Business school deans feel that AACSB accreditation "is valuable, meaningful and essential in today's globally competitive environment" [Miles, et al., 2014, pp. 2-3]. However, beyond the value of competitiveness, some research has found minimal evidence that accredited schools provide a better education or help graduates get better jobs [Hunt, 2015].

This study examines the value and impact of learning outcomes for business and non-business majors as evidenced through an institutional survey of graduating students. The institution has identified Essential Learning Outcomes (ELOs) that reflect those identified by AAC&U [2011]. All academic programs, including those in the school of business, link their program outcomes to these ELOs. The school of business has clearly identified program outcomes per AACSB standards as follows: disciplinary knowledge, written communication, quantitative literacy, oral communication, and critical/analytical problem-solving.

The institution also measures learning outcomes indirectly (as allowed per AACSB standards). This includes feedback from graduating students, alumni, and supervisors of alumni. Such indirect measures help triangulate direct-measure findings and extend understanding of program outcomes. The current study examines the graduating student survey to determine student views on the achievement of essential learning outcomes. The purpose of the study is to determine the level of success of students in undergraduate bachelor degree programs in the school of business compared to that of students in other majors at the university. The research question for the study is as follows:

How much do students graduating in business fields feel their education has contributed to growth in knowledge, skills, and abilities associated with the ELOs compared to students in other majors?

While previous research has focused on identifying commonalities in learning goals, assessment measures, and loop closings for AACSB-accredited schools of

business [Kelley, Tong, and Choi, 2010; Martel and Calderon, 2005; Pringle and Michel, 2007; Wheeling, Miller, and Slocombe, 2015], none that we identified has compared graduating student perspectives on indirect measures of learning for business and non-business majors. As such, business educators do not have a collective research-informed sense of how or if accreditation standards are impacting student views of learning across institutions.

#### LITERATURE REVIEW

Recent research on learning outcomes in higher education covers a range of topics from the classroom to the institution. At the classroom level, it tends to focus on assessment approaches in particular courses [Wiechowski and Washburn, 2014], including practical information on how to measure learning outcomes [Adelman, 2015; Havnes and Prøitz, 2016], conduct assessment at course and program levels [Garfolo and L'Huillier, 2015; Parscale, Dumont, and Plessner, 2015; Prøitz, 2010], and incorporate practices such as signature assignments and rubrics [Garfolo et al., 2016], internships [Grose, 2017], and service learning [Rutti et al., 2016].

At the institutional level, typical topics are faculty involvement [Nasrallah, 2014], managing accreditation requirements [Garfolo and L'Huillier, 2015], and the use of standardized instruments that allow institutional benchmarking and comparisons [Douglass, Thomson, and Zhao, 2012]. Other studies focus on how to measure the student experience as a whole [Tan, Muskat, and Zehrer, 2015], and how to use signature work to measure of outcomes [Schneider, 2015]. These topics indicate the importance of assessment in higher education and various areas of emphasis.

#### Assurance of Learning

Schools of business accredited by AACSB have specific requirements related to assurance of learning [AACSB, 2013]. They must set learning goals, assess achievement of the goals, and address differences between goals and achievement [Attaway et al., 2011]. This requires faculty collaboration to determine "content, delivery, and assessment method" [Attaway et al., 2011, p. 356].

The most common direct measures of learning, based on surveys of business school deans, are written and oral assignments graded with rubrics or embedded into course work [Kelley et al., 2010; Wheeling et al., 2015]. Indirect measures such as surveys of graduating students are also common but are decreasing in use. Martel and Calderon [2005] found that 81 percent of respondents surveyed graduating students, Pringle and Michel [2007] indicated that 46 percent used this measure, and Kelley et al. [2010] identified 39 percent, while Wheeling et al. [2015] reported 40 percent. The reason for the decline is unknown, although a growing preference for direct measures is evident [Wheeling et al., 2015].

Indirect measures are allowed per AACSB standards and are critical to gaining a depth of understanding that goes beyond compliance-based assessment. "Indirect assessments (e.g. employer satisfaction or alumni surveys, etc.) may be used as part of the portfolio of evidence, to provide contextual information for direct assessment or information for continuous improvement" (AASCB, 2013, p. 34).

#### The Culture of Assessment

As with assessment in other contexts, in business schools, practices must be engrained in the culture and belong to the faculty who determine course competencies, map them to learning goals, and determine appropriate measures [Gibson et al., 2013], while ensuring that goals lead to mission fulfillment [Attaway et al., 2011]. A key aspect of assessment is faculty meeting together to discuss results and determine a course of action [Kelley et al., 2010; Pringle and Michel, 2007]. The most common modifications resulting from assessments are minor changes to curriculum, minor changes in course objectives, modifications to teaching style and pedagogy, and better coordination of multisection courses [Kelley et al., 2010; Pringle and Michel, 2007]. Additionally, establishing new course requirements or changing prerequisites are also relatively common [Wheeling et al., 2015].

Similar to findings of the assessment literature outside of schools of business, business faculty are improving evaluation practice. In many cases, this is driven by the desire to achieve or maintain professional accreditation. However, some are striving to evolve from a culture of compliance to one of improvement through the use of change models to address faculty resistance, inconsistencies, and structural challenges [Bennett, Smart, and Kumar, 2017]. Others are focused on individual course or department assessments, such as applied learning projects [Weldy and Turnipseed, 2010], experiential learning that reflects AACSB's emphasis on real-world engagement [Kosnik, Tingle, and Blanton, 2013], teamtaught capstone courses, which emphasize critical thinking, global awareness, and ethics [Balotsky, Stagliano, and Haub, 2016], and the use of rubrics [Gibson, 2011].

#### Compliance and Improvement

On a national level, research has substantiated the value of establishing and measuring essential learning outcomes (ELOs). The National Institute for Learning Outcomes Assessment observes that institutions have progressed over the past ten years or so—expectations for student learning outcomes have become clearer and more public, a greater range of tools and approaches is available, and the use of multiple measures to assess outcomes is more common [NILOA, 2016]. When the focus is on improvement, "*compliance* will take care of itself" [NILOA, 2016, p. 6].

The most recent survey of business school deans indicates that improvement and compliance motivations are about equal. Approximately 91 percent indicated their purpose for assessment was planning and improvement while about 90 percent identified their purpose as accreditation compliance. These results indicate that the two purposes are integrated. Without a mandate for compliance, the extent to which assessment would occur is unknown.

#### Student and Employer Views

Students also have a role in assessment. Much of the work in this realm has focused on e-portfolios, which involve students creating and selecting artifacts that represent their learning, accompanied by reflections on content and approaches to learning [Cambridge, 2010; Miller and Morgaine, 2009]. Other than this, studies on student views of their experiences with learning outcomes or the degree to which their education contributed to achievement of outcomes are not evident in the literature.

Employer findings and corresponding student findings are prevalent at the national level, however, and indicate particular value in broad skills applicable across majors [Hart Research Associates, 2015]. "Employees say that . . . crosscutting skills are more important to an individual's success . . . than . . . undergraduate major" [Hart Research Associates, 2015, p. 2]. Employers feel that students are graduating without sufficient experiences in these areas, however, and endorse application of learning through internships, senior projects, collaborative research, and community projects [Hart Research Associates, 2015]. They also value problem-solving skills, experience with diverse perspectives, written and oral communication, teamwork, ethical decisionmaking, and critical thinking [Hart Research Associates, 2015]. Although students generally concur with the value of these skills, and with the importance of an applied learning experience, they feel confident and well-prepared in these areas in contrast to employers, who indicate that students fall short [Hart Research Associates, 2015].

Although business school deans report collecting information from graduating students, alumni, and employers, albeit in decreasing numbers [Kelley et al., 2010; Martel and Calderon, 2005; Pringle and Michel, 2007; Wheeling et al., 2015], conclusions resulting from these practices are unpublished. Two studies, one focusing on higher education administrators, and the other on department heads in business disciplines, found no evidence of indirect stakeholder assessment [Andrade, 2017; Andrade, Evans, and Hartshorn, 2014, 2015, and 2016; Andrade et al., 2020].

#### A Gap in the Literature

In sum, the literature on assessment in higher education and in schools of business is extensive and includes efforts at classroom, program, institutional, and national levels, with growing emphasis on assessment for improvement in addition to compliance. National studies indicate that employers strongly desire higher education graduates to possess specific broad learning outcomes that are not discipline based. Little is known about student views of learning outcomes other than their perspective, which is not shared by employers, that they possess adequate cross-cutting skills and abilities to be successful in the workforce [Hart Research Associates, 2015].

The literature does indicate outcomes commonly measured in schools of business. Communication, professional business knowledge, integrity and ethics, critical thinking, problem-solving, and global issues were all reported by more than 50 percent of business school deans as being actively assessed [Wheeling, 2015]. These align with the ELOs being measured on a national level [AAC&U, 2011]; however, results are not reported across schools of business nor compared to those of non-business majors. Since employers value ELOs above the major with which a student graduates [Hart Research Associates, 2015], it is incumbent upon schools of business to know how their graduates compare on these outcomes with graduates from other majors. Research has not answered this question.

#### METHODS

The study was conducted at a large, regional, open-admission university in the Western United States. The school of business has the highest enrollments of all colleges/schools on campus, with approximately 5,500 students; the total institutional enrollment is approximately 40,000. The university awards approximately 5,500 degrees (master, bachelor, associate, certificate) per year and has a 34 percent 6-year first-time full-time student graduation rate. The number of surveys in this study reflected 4,918 graduates. Since students took department-specific portions of the survey multiple times if they received multiple awards, there were more responses than respondents in some cases. As such, we cannot calculate a precise response rate, but it is safe to say that the response rate is 95 percent, as the survey was attached to the application for graduation rather than being administered separately.

Consistent with national practices for student learning assessment, the institution that is the context for this study adopted ELOs that reflect the broad skills valued by employers [AAC&U, 2011; Hart Research Associates, 2015]. Learning outcomes for the school of business reflect these ELOs and meet AACSB's assurance of learning standards. Indirect measures of learning, such as surveys of graduating students, are also collected at the institutional level. Although the literature indicates that schools of business currently favor direct measures of assessment, the use of indirect measures is emphasized in AACSB standards [2013].

This study focused on the results of the institution's graduating student survey. The survey contains a range of questions about students' goals and goal achievement; learning outcomes, satisfaction with campus systems, services, and academic programs; financial aid and costs; personal circumstances; and similar types of questions. The institution administers this survey annually to students who graduated the previous year. In total, the survey contains 28 questions, although several have multiple parts, as did the four questions that were the focus for this study—students' self-reported growth in learning outcomes. Three of the questions had subitems focused on various elements of learning outcomes, goal accomplishment, and satisfaction. The internship question had no subparts. The questions and related data can be found in the results section.

The total number of student responses recorded was 4,918. It should be noted that the online survey did not force responses. There were cases in which questions were left blank. We attributed this to students accidentally missing fields, feeling a question did not apply to them, or deciding to submit an incomplete survey. Out of this sample, 700 students identified as business majors (14.2 percent), along with 4,218 non-business majors (85.8 percent). Again, not every survey was entirely complete, and therefore response numbers differed from question to question. A complete list of response numbers for each question can be found in Tables 1 to 7 in the appendix.

#### Survey Questions

We identified six questions from the survey that were concentrated on growth in learning outcomes. A brief description of each question is given below. Unless otherwise stated, the level of significance for comparison tests was set at a *p*-value of < 0.05.

- 1. The first question read as: "How would you rate your overall educational experience?" Respondents were rated on a 5-point Likert scale, with 1 signifying "excellent" and 5 signifying "poor." An independent samples *t*-test was performed to compare the means of the ratings between business majors and all other majors.
- 2. The next question evaluated individual growth. It read "How would you rate how much your education contributed to your growth in the following areas?" The following areas were then rated by the student: knowledge in major field of study, critical thinking and problem solving, communication skills, mathematical skills, interpersonal skills, ethics, preparation for real-world problems, skills to seek and maintain employment, leadership and team management, art and cultural knowledge, community and civic involvement, global perspective, understanding diversity of people and cultures, and desire for lifelong learning (see Table 3 and Figure 1). Responses were recorded using a 4-point Likert-scale, with 1 signifying "great contribution" and 4 signifying "no contribution." A univariate analysis of variance (ANOVA) test was used to compare means between business majors and all other majors in each of the above areas. Business majors and non-business majors were compared



#### Figure 1. Mean Contribution to Growth Ratings by Major

for each of the above areas separately and individually, and not evaluated in an overall basis. The usual level of significance of a *p*-value of <0.05 was given a Bonferroni correction to account for experiment-wise type 1 error inflation. The corrected alpha level was set at 0.003.

- 3. Strength of connection to college was also evaluated. The question read as "Students often have a lifelong feeling of connection to their college. How would you rate the strength of your connection to the university?" Respondents rated on a 5-point Likert scale, with 1 signifying "very weak" and 5 signifying "very strong." An independent samples *t*-test was performed to compare the means of the ratings between business majors and all other majors.
- 4. Students were asked whether they completed an internship or cooperative educational experience during their time at the university. A yes/no response was recorded. A chi-squared test of independence was then conducted to examine the relationship between completing an internship and being a business major.

Figure 2. Proportions of Internship Completion by Major



- 5. Students were asked to identify personal goals they had during their time at the university. A predetermined list of goals was presented, and students were directed to indicate which of the goals, if any, were a personal goal for them. The list of goals focused on finding a job, getting a better job, promotion, skill improvement, job security, satisfying family, transferring to another school, and taking courses while attending another school) (see Table 8 and Figure 2). Students were then asked to rate the extent to which they had achieved their goals. Responses were collected using a 5-point Likert scale, with 1 signifying "not achieved it at all" and 5 signifying "completely achieved it." A univariate ANOVA test was used to compare the means of the multiple scale responses between business majors and all other majors. Our usual level of significance was also given a Bonferroni correction. The corrected alpha level was set at 0.004.
- 6. Lastly, we evaluated student's satisfaction with their programs of study. The following list of areas were given for students to rate: overall experience, engagement in the educational process, opportunities to engage the community through my studies, quality of instruction, course content, class size, accessibility of instructors, faculty interest and caring for students, and academic advising from the department staff (see Table 8 and Figure 4). Ratings were gathered using a 5-point Likert scale, with 1 signifying "very unsatisfied" and 5 signifying "very satisfied." A univariate ANOVA test was used to compare the means of the multiple scale responses between business majors and all other majors. The level of significance was, again, a Bonferroni correction with the corrected alpha set at 0.005.

*Post hoc* tests were not conducted for the ANOVA tests in that only two groups were compared. For questions that involved a scale, a Cohen's d effect size was calculated to visualize differences between the two groups' means.

#### Figure 3. Mean Goal Accomplishment Ratings by Major



#### FINDINGS

Statistical analysis using SPSS produced mixed results, in that some questions showed many statistically significant differences between the two groups, while other questions showed few differences, if any. We will report on each of the six questions in the order they were introduced.

- 1. In response to the question, "How would you rate your overall educational experience?" no significant difference was found [t(4,824) = 0.14, p-value = 0.888] (see Table 2 in the appendix). The means of both groups, in fact, were identical (business majors: mean [M] = 4.29, standard deviation [SD] = 0.71; non-business majors: M = 4.29, SD = 0.70).
- 2. For "How would you rate how much your education contributed to your growth in the following areas?" business majors expressed significantly more growth in several areas when compared to non-business majors, these being:



Figure 4. Mean Satisfaction Ratings by Major

- Mathematical skills, F(1, 4, 782) = 53.77, *p*-value < 0.001.
- Skills to seek and maintain employment, F(1, 4, 787) = 16.64, *p*-value < 0.001.
- Leadership and team management, F(1, 4,788) = 25.90, *p*-value < 0.001.

Non-business majors identified significantly more growth in two areas:

- Art and cultural knowledge, F(1, 4,784) = 31.64, *p*-value < 0.001.
- Community and civic involvement, F(1, 4,784) = 11.02, *p*-value = 0.01

All other areas of this question yielded no statistically significant difference when compared between the two groups (see Table 4 in the appendix).

3. For "How would you rate the strength of your connection to the university," no significant difference was found, t(4,824) = -.996, *p*-value = 0.319 (see Table 6). Means and variance were about equal for business

majors (M = 3.41, SD = 1.02), and non-business majors (M = 3.37, SD = 1.00).

- 4. A significant relationship was found with being a business major and completing an internship  $[\chi^2(1) = 109.96, p$ -value < 0.001]. The majority of business majors completed an internship (56 percent), while roughly a third of non-business majors did (35 percent). An odds ratio effect size (OR) of 2.36 was calculated, indicating that business majors were two times as likely to complete an internship compared to non-business majors (see Table 5 in the appendix). Figure 2 illustrates the proportion of business majors and non-business majors that completed an internship, based on a yes/no response.
- 5. For the question regarding the accomplishment of students' self-identified goals, non-business majors rated a significantly higher level of achievement for the following:
- Gaining skills to find a job in unemployment, F(1, 2998) = 9.93, *p*-value = 0.002.
- Gaining skills to find a more satisfying or better paying job, F(1, 4509) = 13.57, *p*-value < 0.001.
- Gaining skills to earn a promotion or a raise, F(1) = 11.31, *p*-value = 0.001.
- Improving skills for current job, F(1) = 12.92, *p*-value < 0.001.
- Satisfying the requests of family or other people, F(1, 2787) = 9.99, *p*-value = 0.002.

Non-business majors did not indicate a higher level of achievement for any of the prescribed goals on a statistically significant level. This question, however, did contain the largest diversity in responses, possibly due to varying response numbers, for a student would simply leave a question blank if the particular goal did not apply. See Figure 3, which displays the mean rating of both business and non-business majors for questions aimed at measuring self-perceived level of accomplishment of personal educational goals.

It should be noted that business majors averaged higher ratings in every area referring to employment. For an exact list of descriptive statistics regarding this question, see Table 6 and Table 7 in the appendix.

6. When students' ratings of program satisfaction were compared, no significant differences were identified (see Table 9 in the appendix). All means were nearly identical in all nine areas. See Figure 4 for the mean ratings of both business and non-business majors for questions aimed at measuring satisfaction with the degree/program.

Student ratings across all Likert scales were all negatively skewed, mostly to a moderate degree. This indicates that the majority of the graduating students'

responses were positive, compared to a negative or even neutral response. This occurred even when scales were negatively coded, such as in the case of the question measuring overall educational experience. In fact, all negative ratings (1 and 2 on a 5-point scale and 1 on a 4-point scale) comprised less than 20 percent of the total rankings for every question. The only exception was the question regarding reaching goals of achieving credits, which still had negative responses that summed to only 22 percent of all ratings. Rating distributions can be viewed in the corresponding tables in the appendix.

The effect sizes, as calculated through Cohen's d, varied slightly from question to question but remained relatively small, with the highest value topping out at 0.33. Ninety-one percent of the question areas had values between 0 and 0.2, which is traditionally considered a small effect size. This could largely be due to the majority of the ratings falling between the two or three positive options on a scale rating, as previously stated. Additionally, the mean difference between the two groups never exceeded a full point for each respective Likert scale. This supports the notion that, even in areas where the differences of means of business majors and non-business majors did prove statistically significant, these differences were small-scale. It can be generally stated that business and non-business majors alike rated similarly and positively regarding their university experience.

#### DISCUSSION

Given that business schools emphasize learning outcomes due to AACSB requirements, one might expect business graduates to self-report higher levels of growth than non-business majors, at least in some areas. This was true and in expected ways. Business majors reported significantly higher skills in finding a job or a better job, being promoted or getting a raise, satisfying family, math skills, job-seeking and job-maintaining skills, leadership and management, and completing an internship than students in other majors. The findings almost approached significance for business majors in increasing job security and satisfying current employers. On the other hand, non-business majors reported significantly stronger skills in art and cultural knowledge and community and civic engagement with diversity approaching significance. These findings are fairly predictable given the different emphases of majors, but business majors may also be more likely to place emphasis on job- and leadership-related skills than their counterparts in other majors. This may be part of their training but also their natural focus, which led them to major in business in the first place. The same is true of non-business majors.

All students gave themselves positive, although not unrealistic, ratings on the learning outcomes that employers value, such as critical thinking, communication, interpersonal skills, ethics, preparation for real-world problems, leadership/teamwork, and diversity. This is consistent with national studies of recent college graduates' perspectives as to the level to which they believe they have mastered these skills [Hart

Research Associates, 2015]. This equivalency regarding cross-cutting skills for both groups is the most important takeaway from this study. Again, AASCB-accredited schools of business place heavy emphasis on these skills, and one would expect business graduates to stand out in these areas, particularly since employers value these skills above a specific major. In this sense, business majors are apparently not in a better position for employment than graduates of any other major (in spite of business students' confidence in job-finding and job-keeping skills, being promoted, and similar outcomes).

This is an actionable finding for the school of business at the institution where the study occurred—the school must help students recognize the importance of cross-cutting skills and place greater emphasis on them. Also, the deans and faculty in other majors need to help their students develop more confidence related to job-related skills. Once again, an emphasis on the value of cross-cutting skills and an indication of the degree to which students are achieving them is critical. The non-business majors may be equally marketable as those in business but simply do not recognize it. In short, the differences between the two groups in this study might be considered somewhat predictable, at least for the areas apart from cross-cutting skills. However, the findings that business students are as prepared with the cross-cutting skills that employers value as those in other areas of study could be considered somewhat of a failure.

Other schools may have completely different results from comparative studies such as this and additional actionable results. Collectively, schools of business need this information to determine to what extent they are truly meeting employer needs and the intent of AACSB standards. One might consider the results disappointing, given that AACSB assurance of learning standards identify essential learning outcomes such as communication, ethical reasoning, analytical thinking, interpersonal relations and teamwork, and application of knowledge. Given this emphasis in AACSB business schools, one would expect business students to rate themselves higher on these outcomes than other students. As such, business schools need to consider the value of input from graduating students, particularly in a comparative format, and recommit themselves to obtaining this information.

Perspectives are also needed from other stakeholders, such as employers, to determine the accuracy of student self-ratings, as perspectives may differ substantially [Hart Research Associates, 2015]. This is a limitation in the current study, and we plan to address this in a future study. While the institution does collect these data, similarities and differences between the survey findings are too detailed to discuss in this article. We also recognize the limitations of self-reported data; once again, additional perspectives and triangulation of data would help address this.

The studies cited in the literature review indicate that both graduating student and employer surveys are decreasing in use [Kelley et al., 2010; Martel and Calderon, 2005; Pringle and Michel, 2007; Wheeling et al., 2015]. This is a serious omission. The purpose of higher education and schools of business in particular is to prepare students for their professional endeavors, and particularly to help them develop the ability to think and analyze, solve problems, communicate, create, and innovate, which is the purpose of essential learning outcomes. How can we know if students have these abilities unless they and their employers have the opportunity to share their perspectives and unless institutions are engaged in this type of research and in sharing their results?

#### CONCLUSION

With rigorous standards for teaching and learning in place at AASCBaccredited business schools, this study rather interestingly found that graduating students across majors do not differ in their perceptions of their achievement of cross-cutting learning outcomes, although the two groups do differ in perhaps expected ways related to their majors. This information is important for stakeholders in business programs, given the emphasis on learning by AACSB, particularly as national studies indicate that certain skills and abilities, such as communication, critical thinking, ethics, and global competencies are highly valued across sectors (AAC&U, 2011; Hart Research Associates, 2015). Encouragingly, the study demonstrates positive findings from the student perspective for these important outcomes, but it certainly does not distinguish business graduates from those in other fields.

This study is limited to one institution and one stakeholder group—graduating students. Future studies need to expand this perspective to additional stakeholders, such as alumni and employers, to determine if and how their views differ, and to additional AACSB-accredited schools. These perspectives are critically important to those preparing students for their future professions. "Learning outcome statements are most useful when they are crafted to inform effective educational policies and practices, not to meet compliance demands by external groups" (NILOA, 2016, p. 5). The more that is known about learning outcomes, and from a variety of sources across institutions, such as students, faculty members, alumni, and employers, the more business schools can respond to making needed changes to strengthen these outcomes.

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#### APPENDIX

				Rating	g Distr	ibutio	n	
	n	M	SD	Very Poor	Poor	Fair	Good	Excellent
How would you								
rate your overall								
educational								
experience?								
NBM	4134	4.29	.70	<1%	1%	9%	48%	42%
BM	690	4.29	.71	1%	1%	9%	49%	41%
Total	4824	4.29	.71	<1%	1%	9%	48%	41%
How would you								
rate the strength								
of your connection								
to the University?								
NBM	4134	3.37	1.00	5%	12%	39%	32%	13%
BM	690	3.41	1.02	5%	10%	36%	35%	14%
Total	4824	3.37	1.00	5%	12%	39%	32%	13%

#### Table 1. Descriptives for Questions Evaluated by Independent Samples Test

Note: For this table and subsequent tables, NBM, non-business majors and BM, business majors. *M*, mean; SD, standard deviation.

	Leve Tes Equa Vari	ene's t for lity of ances	<i>t-</i> Test for Equality of Means					
						95 Confi Inte	idence erval	
	F	р	df	t	р	Lower	Upper	Cohens's d
How would you rate								
your overall								
educational								
experience?								
Equal variances	.044	.835	4822	.14	.888	053	.061	<.01
assumed								
Equal variances			931.62	.14	.889	053	.061	
not assumed								
How would you rate								
the strength of								
your								
connection to								
the University?								
Equal variances	.412	.521	4822	-1.00	.319	122	.040	.04
assumed								
Equal variances			925.24	98	.325	123	.041	
not assumed								

#### Table 2. Independent Samples Test

Notes: Statistical significance was determined at the p < .05 level, two-tailed.

# Table 3. Descriptives for "How Would You Rate How Much Your Education at The University Contributed to Your Growth In The Following Areas?"

				Rating Distribution				
	n	M	SD	None	Little	Moderate	Great	
Knowledge in major field of study								
NBM	4111	3.58	.65	1.2%	5.2%	28.2%	65.5%	
BM	686	3.60	.57	0.4%	2.9%	32.5%	64.1%	
Total	4797	3.58	.64	1.1%	4.9%	28.8%	65.3%	
Critical thinking and problem-solving skills								
NBM	4101	3.44	.68	1.3%	6.8%	38.3%	53.6%	
BM	684	3.43	.66	0.9%	6.6%	40.8%	51.8%	
Total	4785	3.44	.67	1.2%	6.7%	38.7%	53.4%	
Communication skills								
NBM	4097	3.35	.73	1.6%	10.3%	39.5%	48.7%	
BM	686	3.40	.69	1.2%	8.3%	40.4%	50.1%	
Total	4783	3.36	.72	1.5%	10.0%	39.6%	48.9%	
Mathematical skills								
NBM	4098	2.90	92	7.9%	23.7%	38.9%	29.5%	
BM	684	3.17	79	3.1%	14 5%	44.6%	37.9%	
Total	4782	2.94	90	7 2%	22 4%	39.7%	30.7%	
Internersonal skills	4702	2.74		7.270	22.470	59.170	50.770	
NBM	4097	3 21	78	2.6%	14.6%	42.1%	40.6%	
BM	686	3.27	73	1.3%	12.5%	43.9%	42.3%	
Total	4783	3.27	78	2 4%	14.3%	43.5%	40.9%	
Fthics	7705	5.22	.70	2.470	14.570	72.770	40.770	
NBM	4100	3.12	86	5.0%	16.3%	40.5%	38.2%	
BM	686	3.12	82	3.5%	15.9%	40.8%	39.8%	
Total	4786	3.17	85	4.8%	16.2%	40.6%	38.4%	
Preparation for real-world problems	7700	5.15	.05	4.070	10.270	40.070	50.470	
NBM	4102	3 20	80	3 1%	14.2%	42.3%	40.4%	
BM	686	3.20	.80	2 30/2	17.10/2	42.370	40.470	
Total	1799	3.24	.75	2.370	12.170	44.870	40.870	
Skills to soak and maintain amployment	4/00	3.20	./9	3.070	13.970	42.070	40.470	
NDM	4102	2.15	06	1 60/	17.00/	26.00/	41.50/	
NBM BM	4103	2.20	.00	4.070	10.70/	41.20/	41.370	
DIM T-t-1	4797	3.30	./0	2.0%	10.7%	41.2%	43.3%	
I otal	4/8/	3.17	.85	4.3%	10.1%	37.3%	42.0%	
Leadership and team management	4104	2.12	07	4.60/	17.00/	28.00/	20 (0/	
NBM	4104	3.13	.80	4.0%	17.9%	38.0%	39.0%	
BM	684	3.30	./5	1.8%	12.4%	39.5%	46.3%	
l otal	4788	3.15	.85	4.2%	17.1%	38.2%	40.6%	
Art and cultural knowledge	1100	2.00	0.1	<b>-</b> 00/	26.50/	22.00/	21.604	
NBM	4100	2.89	.94	7.8%	26.7%	33.9%	31.6%	
BM	684	2.67	.93	11.1%	31.0%	37.3%	20.6%	
Total	4784	2.86	.94	8.3%	27.3%	34.4%	30.0%	
Community and civic involvement								
NBM	4102	2.82	.95	9.5%	26.6%	35.9%	28.0%	
BM	682	2.70	.90	10.0%	30.8%	39.0%	20.2%	
Total	4784	2.81	.94	9.5%	27.2%	36.4%	26.9%	

#### Table 3. Descriptives for "How Would You Rate How Much Your Education at The University Contributed to Your Growth in The Following Areas?" (continued)

				Rating Distribution			
	n	М	SD	None	Little	Moderate	Great
Global perspective							
NBM	4100	3.00	.90	6.2%	21.8%	37.4%	34.5%
BM	684	2.96	.87	6.0%	21.9%	42.3%	29.8%
Total	4784	3.00	.90	6.2%	21.8%	38.1%	33.9%
Understanding diversity of people and cultures							
NBM	4103	3.14	.89	5.5%	16.9%	35.8%	41.8%
BM	685	3.05	.88	5.5%	19.3%	39.9%	35.3%
Total	4788	3.13	.89	5.5%	17.2%	36.4%	40.9%
Desire for lifelong learning							
NBM	4103	3.36	.80	3.4%	10.4%	32.8%	53.4%
BM	683	3.32	.79	3.1%	11.0%	37.0%	48.9%
Total	4786	3.35	.80	3.4%	10.5%	33.4%	52.7%

#### Table 4. ANOVA for "How Would You Rate How Much Your Education at The University Contributed to Your Growth in The Following Areas?"

Knowledge in major field of study       Image: Constraint of the state of the sta		SS	df	MS	Cohen's d	F	р
Between Groups         .34         1         .34        02         .84         .359           Within Groups         1937.97         4795         .40	Knowledge in major field of study						Î
Within Groups         1937.97         4795         .40         Image: constraint of the second se	Between Groups	.34	1	.34	02	.84	.359
Total1938.314796Image: constraint of the sector of the s	Within Groups	1937.97	4795	.40			
Critical thinking and problem-solving skills       Image: matrix of the system of the s	Total	1938.31	4796				
Between Groups         .05         1         .05         .01         .11         .737           Within Groups         2172.22         4783         .45 </td <td>Critical thinking and problem-solving skills</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Critical thinking and problem-solving skills						
Within Groups         2172.22         4783         .45         Image: constraint of the state of the s	Between Groups	.05	1	.05	.01	.11	.737
Total       2172.27       4784       Image: constraint of the second s	Within Groups	2172.22	4783	.45			
Communication skillsIIIIIBetween Groups $1.05$ $1$ $1.05$ $05$ $2.03$ $.155$ Within Groups $2487.30$ $4781$ $.52$ IITotal $2488.35$ $4782$ IIIMathematical skillsII $43.39$ $23$ $53.77$ $<.001^*$ Between Groups $43.39$ 1 $43.39$ $23$ $53.77$ $<.001^*$ Within Groups $3857.02$ $4780$ $.81$ IITotal $3900.41$ $4781$ IIIInterpersonal skillsIIIIIBetween Groups $2.38$ $1$ $2.38$ $06$ $3.96$ $.047$ Within Groups $2877.22$ $4781$ $.60$ IIEthicsII $1.49$ $05$ $2.06$ $.151$ Within Groups $1.49$ $1$ $1.49$ $05$ $2.06$ $.151$ Within Groups $3457.54$ $4784$ $.72$ IITotal $3459.03$ $4785$ IIIPreparation for real-world problemsII $1.02$ $04$ $1.63$ $.201$ Within Groups $2976.99$ $4786$ $.62$ IITotal $2978.01$ $4787$ IIIITotal $2978.01$ $4787$ IIIIHordIIIIIII<	Total	2172.27	4784				
Between Groups         1.05         1         1.05        05         2.03         .155           Within Groups         2487.30         4781         .52              Total         2488.35         4782                Mathematical skills  <	Communication skills						
Within Groups       2487.30       4781       .52          Total       2488.35       4782           Mathematical skills             Between Groups       43.39       1       43.39      23       53.77       <.001*	Between Groups	1.05	1	1.05	05	2.03	.155
Total         2488.35         4782         Image: constraint of the state of the stat	Within Groups	2487.30	4781	.52			
Mathematical skills         Image:	Total	2488.35	4782				
Between Groups       43.39       1       43.39      23       53.77       <.001*	Mathematical skills						
Within Groups       3857.02       4780       .81           Total       3900.41       4781            Interpersonal skills               Between Groups       2.38       1       2.38      06       3.96       .047         Within Groups       2877.22       4781       .60            Total       2879.60       4782             Ethics                 Between Groups       1.49       1       1.49      05       2.06       .151         Within Groups       3457.54       4784       .72            Total       3459.03       4785              Preparation for real-world problems                Between Groups       1.02       1       1.02      04       1.63       .201         Within Groups       2976.99       4786       .62	Between Groups	43.39	1	43.39	23	53.77	<.001*
Total       3900.41       4781       Image: constraint of the state of the st	Within Groups	3857.02	4780	.81			
Interpersonal skills         Image: Constraint of the system of the	Total	3900.41	4781				
Between Groups         2.38         1         2.38        06         3.96         .047           Within Groups         2877.22         4781         .60	Interpersonal skills						
Within Groups       2877.22       4781       .60       Image: constraint of the system of	Between Groups	2.38	1	2.38	06	3.96	.047
Total         2879.60         4782         Image: colored system           Ethics         1         1.49         1         1.49         1           Between Groups         1.49         1         1.49        05         2.06         .151           Within Groups         3457.54         4784         .72         Image: colored system	Within Groups	2877.22	4781	.60			
Ethics         Image: Constraint of the system of the	Total	2879.60	4782				
Between Groups         1.49         1         1.49        05         2.06         .151           Within Groups         3457.54         4784         .72 <t< td=""><td>Ethics</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Ethics						
Within Groups       3457.54       4784       .72	Between Groups	1.49	1	1.49	05	2.06	.151
Total         3459.03         4785         Image: Constraint of the state of the stat	Within Groups	3457.54	4784	.72			
Preparation for real-world problems         Image: Constraint of the second	Total	3459.03	4785				
Between Groups         1.02         1         1.02        04         1.63         .201           Within Groups         2976.99         4786         .62             Total         2978.01         4787	Preparation for real-world problems						
Within Groups         2976.99         4786         .62           Total         2978.01         4787	Between Groups	1.02	1	1.02	04	1.63	.201
Total 2978.01 4787	Within Groups	2976.99	4786	.62			
	Total	2978.01	4787				
Skills to seek and maintain employment	Skills to seek and maintain employment						
Between Groups 12.03 1 12.0313 16.64 <.001*	Between Groups	12.03	1	12.03	13	16.64	<.001*
Within Groups 3459.44 4785 .72	Within Groups	3459.44	4785	.72			
Total 3471.47 4786	Total	3471.47	4786				
Leadership and team management	Leadership and team management						
Between Groups 18.55 1 18.5514 25.90 <.001*	Between Groups	18.55	1	18.55	14	25.90	<.001*
Within Groups 3427.37 4786 .72	Within Groups	3427.37	4786	.72			
Total 3445.92 4787	Total	3445.92	4787				
Art and cultural knowledge	Art and cultural knowledge						
Between Groups 27.85 1 27.85 .22 31.64 <.001*	Between Groups	27.85	1	27.85	.22	31.64	<.001*
Within Groups 4209.43 4782 .88	Within Groups	4209.43	4782	.88			
Total 4237.28 4783	Total	4237.28	4783				
Community and civic involvement	Community and civic involvement						
Between Groups 9.73 1 9.73 .11 11.02 .001*	Between Groups	9.73	1	9.73	.11	11.02	.001*
Within Groups         4221.48         4782         .88	Within Groups	4221.48	4782	.88			
Total 4231.21 4783	Total	4231.21	4783				

#### Table 4. ANOVA for "How Would You Rate How Much Your Education at The University Contributed to Your Growth in The Following Areas?" (continued)

	SS	df	MS	Cohen's d	F	р
Global perspective						
Between Groups	1.10	1	1.10	.03	1.37	.242
Within Groups	3850.83	4782	.81			
Total	3851.93	4783				
Understanding diversity of people and cultures						
Between Groups	4.63	1	4.63	.09	5.89	.015
Within Groups	3761.68	4786	.79			
Total	3766.31	4787				
Desire for lifelong learning						
Between Groups	1.08	1	1.08	.04	1.69	.194
Within Groups	3070.20	4784	.64			
Total	3071.28	4785				

Note: Statistical significance was determined at the p < .003 level (Bonferroni adjusted). ANOVA, analysis of variance.

#### Table 5. Crosstabulation for "Did You Complete an Internship or Cooperative Education Experience While at The University?"

	No	Yes	Total	$\chi^2$	р
NBM					
Count	2680	1452	4132	109.96	<.001*
% within	64.9%	35.1%	100.0%		
Residual	123.8	-123.8			
BM					
Count	303	387	690		
% within	43.9%	56.1%	100.0%		
Residual	-123.8	123.8			
Total					
Count	2,983	1839	4822		
% within	61.9%	38.1%	100.0%		

Notes: Statistical significance was set at the p < .05 level.

# Table 6. Descriptives for "How Would You Rate The Extent to Which YouHave Achieved Your Goals Now That You are Graduating?" Select all thatapply

				Rating Distribution				
	n	M	SD	None	Little	Some	Most	All
Not working and want to								
gain skills to find a job								
NBM	2562	3.68	1.12	6%	7%	26%	34%	27%
BM	436	3.86	1.07	4%	6%	21%	37%	32%
Total	2998	3.71	1.11	6%	6%	26%	35%	27%
Want to gain skills that will lead								
to a more satisfying or better								
paying job								
NBM	3856	3.76	1.02	3%	7%	26%	37%	27%
BM	653	3.92	.97	3%	5%	21%	41%	31%
Total	4509	3.78	1.02	3%	7%	26%	37%	27%
Want to gain skills that will earn								
a promotion or raise in my								
current job								
NBM	2237	3.54	1.17	8%	9%	28%	32%	24%
BM	487	3.74	1.12	5%	9%	22%	35%	29%
Total	2724	3.58	1.17	8%	9%	27%	33%	25%
Want to improve my skills in								
my current job								
NBM	2303	3.74	1.07	4%	8%	24%	36%	27%
BM	493	3.93	1.02	2%	7%	21%	35%	35%
Total	2796	3.78	1.06	4%	8%	24%	36%	29%
Want to gain skills that will increase								
my job security in my current job								
NBM	1482	3.74	1.11	5%	7%	24%	34%	29%
BM	310	3.89	1.04	3%	7%	21%	36%	33%
Total	1792	3.76	1.10	5%	7%	24%	35%	29%
Want to satisfy the requests of								
my current employer								
NBM	1313	3.78	1.15	6%	7%	22%	33%	32%
BM	311	3.95	1.04	3%	7%	21%	33%	37%
Total	1624	3.81	1.13	6%	7%	22%	33%	33%
Want to satisfy the requests of								
my family or other people								
NBM	2332	4.09	.96	2%	4%	19%	33%	42%
BM	455	4.24	.89	0%	4%	17%	29%	50%
Total	2787	4.11	.95	2%	4%	19%	33%	43%

# Table 6. Descriptives for "How Would You Rate The Extent to Which YouHave Achieved Your Goals Now That You are Graduating?" Select all thatapply (continued)

				Rating Distribution				
	n	M	SD	None	Little	Some	Most	All
Want to take general education								
courses before transferring to								
another school								
NBM	1257	3.79	1.34	12%	5%	18%	24%	42%
BM	179	3.49	1.48	18%	7%	20%	20%	36%
Total	1436	3.75	1.36	12%	5%	18%	23%	41%
Want to take some courses at								
UVU while primarily attending								
another school								
NBM	460	3.45	1.40	17%	5%	23%	25%	30%
BM	97	3.54	1.36	13%	7%	24%	24%	32%
Total	557	3.47	1.40	17%	5%	23%	25%	30%
Want to take course work for								
personal interest or								
development								
NBM	2952	4.01	.97	2%	5%	21%	35%	38%
BM	453	3.99	1.04	2%	7%	23%	27%	41%
Total	3405	4.01	.98	2%	5%	21%	34%	38%
Want to have a university experience								
NBM	2690	3.93	1.09	2%	10%	21%	28%	40%
BM	452	3.96	1.10	3%	10%	18%	29%	41%
Total	3142	3.94	1.09	2%	10%	20%	28%	40%
I have some other goals not								
listed above								
NBM	418	3.96	1.29	9%	4%	18%	19%	50%
BM	83	3.64	1.24	7%	10%	28%	23%	33%
Total	501	3.91	1.29	9%	5%	19%	20%	47%

## Table 7. ANOVA for "How Would You Rate The Extent to Which You Have Achieved Your Goals Now That You are Graduating?"

	CC	10	MC	Cale and a	E	
	33	aj	MS	Conen's a	ľ	<i>p</i>
Not working and want to gain						
Skills to find a job	12.20	1	12.20	17	0.02	002*
Between Groups	12.29	2006	12.29	1/	9.93	.002*
Within Groups	3707.00	2990	1.24			
10tal	3/19.95	2997				
to a more satisfying or better						
noving job						
Between Groups	14.03	1	14.03	_ 15	13 57	000*
Within Ground	14.03	4507	14.03	.15	15.57	.000
Total	4037.23	4507	1.05			
Want to goin skills that will som	40/1.20	4308				
a promotion or raise in my						
a promotion of faise in my						
Between Grouns	15.24	1	15.34	- 10	11 21	001*
Within Groups	3601 78	2722	13.34	.17	11.51	.001
Total	3707 12	2722	1.50			
Want to improve my skills in my	5707.12	2123				
current job						
Between Grouns	14 57	1	14 57	- 18	12.92	000*
Within Groups	3148.93	2794	1 1 1 3	.10	12.72	.000
Total	3163 50	2795	1.15			
Want to gain skills that will	5105.50	21)5				
increase my job security in my						
current job						
Between Groups	6.09	1	6.09	- 14	5.03	.025
Within Groups	2168.11	1790	1.21		0.00	
Total	2174.20	1791				
Want to satisfy the requests of my						
current employer						
Between Groups	6.82	1	6.82	15	5.38	.021
Within Groups	2056.90	1622	1.27			
Total	2063.72	1623				
Want to satisfy the requests of my						
family or other people						
Between Groups	9.07	1	9.07	14	9.99	.002*
Within Groups	2528.19	2785	.91			
Total	2537.26	2786				

## Table 7. ANOVA for "How Would You Rate The Extent to Which You Have Achieved Your Goals Now That You are Graduating?" (continued)

	SS	df	MS	Cohen's d	F	р
Want to take general education						
courses before transferring to						
another school						
Between Groups	14.10	1	14.10	.33	7.62	.006
Within Groups	2652.13	1434	1.85			
Total	2666.22	1435				
Want to take some courses at UVU						
while primarily attending						
another school						
Between Groups	.56	1	.56	09	.29	.591
Within Groups	1082.07	555	1.95			
Total	1082.64	556				
Want to take course work for						
personal interest or development						
Between Groups	.27	1	.27	.02	.28	.598
Within Groups	3279.43	3403	.96			
Total	3279.70	3404				
Want to have a university experience						
Between Groups	.21	1	.21	03	.17	.677
Within Groups	3713.94	3140	1.18			
Total	3714.14	3141				
I have some other goals not listed						
above						
Between Groups	7.34	1	7.34	.31	4.46	.035
Within Groups	821.62	499	1.65			
Total	828.96	500				

Notes: Statistical significance was determined at the p < .004 level (Bonferroni adjusted).

# Table 8. Descriptives for "How Satisfied Were You with Each Of The<br/>Following Aspects of Your Major or Program?"

				Rating Distribution						
				Very			Very			
	N	M	SD	Unsatisfied	Unsatisfied	Neutral	Satisfied	Satisfied		
Overall experience with the										
program					<b>A</b> (A)					
NBM	4135	4.04	.82	1.3%	2.6%	15.9%	51.6%	28.7%		
BM	686	4.06	.76	1.0%	1.6%	15.2%	54.5%	27.7%		
Total	4821	4.04	.81	1.3%	2.4%	15.8%	52.0%	28.5%		
Engagement in the educational process										
NBM	4125	3.99	.81	1.4%	2.2%	17.9%	52.7%	25.9%		
BM	686	3.98	.78	1.0%	2.0%	19.4%	53.2%	24.3%		
Total	4811	3.99	.80	1.3%	2.2%	18.1%	52.7%	25.6%		
Opportunities to engage the community										
NBM	4128	3.69	.90	1.7%	4.8%	36.5%	37.3%	19.7%		
BM	685	3.63	.88	1.8%	5.5%	37.2%	39.1%	16.4%		
Total	4813	3.68	.90	1.7%	4.9%	36.6%	37.6%	19.2%		
Quality of instruction										
NBM	4122	3.98	.84	1.5%	3.5%	16.7%	52.3%	26.0%		
BM	684	3.98	.79	1.3%	2.8%	15.6%	57.2%	23.1%		
Total	4806	3.98	.83	1.4%	3.4%	16.6%	53.0%	25.6%		
Course content										
NBM	4123	3.97	.81	1.4%	3.3%	16.2%	54.9%	24.3%		
BM	684	3.95	.78	1.2%	2.9%	17.4%	56.7%	21.8%		
Total	4807	3.97	.81	1.4%	3.2%	16.4%	55.1%	23.9%		
Class size										
NBM	4125	4.14	.79	1.0%	1.6%	14.2%	48.3%	34.9%		
BM	686	4.13	.76	0.7%	1.6%	13.7%	52.2%	31.8%		
Total	4811	4.14	.79	1.0%	1.6%	14.2%	48.8%	34.4%		
Accessibility of instructors										
NBM	4126	4.07	.84	1.4%	2.5%	16.5%	47.2%	32.5%		
BM	685	4.03	.82	1.5%	2.2%	16.5%	51.2%	28.6%		
Total	4811	4.06	.84	1.4%	2.4%	16.5%	47.8%	31.9%		
Faculty interest in and caring for students										
NBM	4124	4.05	.89	2.0%	2.6%	17.7%	44.0%	33.7%		
BM	686	3.99	.84	1.5%	2.5%	19.2%	49.0%	27.8%		
Total	4810	4.04	.88	1.9%	2.6%	18.0%	44.7%	32.8%		
Academic advising from the department staff										
NBM	4129	3.87	1.02	3.6%	5.5%	20.7%	40.1%	30.0%		
BM	685	3.83	1.0	3.5%	6.0%	20.6%	43.8%	26.1%		
Total	4814	3.87	1.01	3.6%	5.6%	20.7%	40.6%	29.5%		

	SS	df	MS	Cohen's d	F	p
Overall experience with the program						
Between Groups	.40	1	.40	02	.61	.437
Within Groups	3148.72	4819	.65			
Total	3149.11	4820				
Engagement in the educational process						
Between Groups	.16	1	.16	.01	.24	.622
Within Groups	3095.54	4809	.64			
Total	3095.70	4810				
Opportunities to engage the community						
Between Groups	1.95	1	1.95	.06	2.42	.120
Within Groups	3868.30	4811	.80			
Total	3870.25	4812				
Quality of instruction						
Between Groups	.00	1	.00	<.01	.00	.979
Within Groups	3299.83	4804	.69			
Total	3299.84	4805				
Course content						
Between Groups	.30	1	.30	.02	.46	.500
Within Groups	3145.27	4805	.65			
Total	3145.57	4806				
Class size						
Between Groups	.16	1	.16	.01	.26	.612
Within Groups	2976.29	4809	.62			
Total	2976.45	4810				
Accessibility of instructors						
Between Groups	.74	1	.74	.04	1.05	.305
Within Groups	3379.54	4809	.70			
Total	3380.28	4810				
Faculty interest in and caring for students						
Between Groups	1.77	1	1.77	.06	2.26	.133
Within Groups	3757.65	4808	.78			
Total	3759.42	4809				
Academic advising from the department						
staff						
Between Groups	1.08	1	1.08	.04	1.05	.306
Within Groups	4974.36	4812	1.03			
Total	4975.45	4813				

#### Table 9. ANOVA for "How Satisfied Were You With Each of The Following Aspects of Your Major or Program?"

Notes: Statistical significance was determined at the p < .005 level (Bonferroni adjusted).
## **Engaging Students through Activity Design:** A Service-Dominant Logic Perspective

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Consistent with service-dominant logic, we examine how cocreated higher education learning experiences facilitate student engagement and enhance students' value perceptions. Through moderated regression analyses, this study finds that effective faculty support, event format, and awards strengthen the relationship between student value perceptions of an extracurricular activity (i.e. the One Day Challenge) and engagement in word-of-mouth activity. Creating meaningful learning experiences through extracurricular activities is a challenging endeavor. This study provides theory-based empirical evidence of the ability to mitigate those challenges by designing engagement activities that place learners at the center of the educational experience.

Keywords: Student Engagement, Activity Design, Business Education, Service-Dominant Logic, Extracurricular ActivitiesDisciplines of Interest: Business Education, Marketing, Management, Higher Education Administration, Higher Education Teaching

#### INTRODUCTION

In an environment of increasing complexity and competitive intensity, it is vital that higher education institutions provide not only a high-quality and cuttingedge curriculum, but also formative experiences to engage students in a holistic learning environment. The servicescape of higher education now reflects many

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other industries as students and their families adopt the "student as customer" mindset [Chalcraft, Hilton, and Hughes, 2015] and view higher education as a consumer-driven marketplace [Delucchi and Korgen, 2002]. This shift has led to widespread use of the student-centered model [Hennig-Thurau, Langer, and Hansen, 2001], and research has increasingly focused on student engagement to strengthen value creation and service delivery.

In light of higher education's current service focus, extant marketing literature is both applicable and helpful in tackling student (customer) engagement in higher education and learning experiences. Customer engagement offers numerous benefits, including purchase behavior, feedback, and referrals via word-of-mouth (WOM) activity [Kumar et al., 2010; Van Doorn, et al., 2010]. Although WOM activity is beyond the direct control of firms, research has found that firms can stimulate positive WOM activity by improving customer satisfaction, perceived value, and brand loyalty [Karjaluoto, Munnukka, and Kiuru, 2016]. Applying these insights to higher education, we investigate the conditions influencing the relationship between student value perceptions and referral intentions (the highest degree of positive WOM) in the context of an extracurricular learning experience: the One Day Challenge (full description in the section titled "Extracurricular Cocreation Project: One Day Challenge"). Through this research, we expand upon the knowledge of extracurricular participation with a focus on engaging students as cocreators and increasing student value perceptions, which will increase WOM activity.

Service-dominant (S-D) logic maintains that cocreation experiences between customers and firms contribute to the value perception of a service [Vargo and Lusch, 2004]. Current higher education research asserts that students who cocreate their education through participation in learning activities have increased academic performance, satisfaction with the learning experience, and value perception of their education [Astin, 1993; Celuch et al., 2018; Kahu, 2013]. Extracurricular activities have emerged as an effective avenue for student engagement and cocreation of learning [Carini, Kuh, and Klein, 2006; Celuch et al., 2018, Smith, Sheppard, Johnson, and Johnson, 2005], yet little research exists on the conditions that elicit meaningful learning experiences or participation in the event. Furthermore, extant research calls for deeper examination of how students cocreate their education and engage more fully in their academic experience [Bovill, Cook-Sather, and Felten, 2011]. This study identifies the conditions under which students are likely to perceive value in engagement activities and recommend their friends to participate (i.e. WOM intentions). Applying S-D logic, we reason that cocreation of educational experiences supports student engagement and examine the extent to which an extracurricular activity (i.e., the One Day Challenge) can enhance the learning experience and supplement educational outcomes.

Given the numerous benefits of extracurricular activities [Bartkus, Nemelka, Nemelka, and Gardner, 2012; Boone, Kurtz, and Fleenor, 1988; Chia, 2005; Cole, Rubin, Feild, and Giles, 2007; Rubin, Bommer, and Baldwin, 2002; Rynes, Trank,

Lawson, and Ilies, 2003], educational institutions should strive to increase the awareness of and participation in these engagement activities. Since it is voluntary by nature, participation in extracurricular activities is not guaranteed, which underscores the importance of positive WOM behavior, as the recommendation of a trusted friend has a significant impact on people's actions [Bughin, Doogan, and Vetvik, 2010]. This study explores the relationship between students' value perceptions of an extracurricular event (i.e., the One-Day Challenge) and their likelihood to recommend participation to a friend. Specifically, we examine this relationship as a function of faculty support, event format, and event awards, as we predict that these event elements strengthen the relationship between value perceptions and likelihood of recommendation. This extracurricular event was completely voluntary.

This study is structured as follows. First, extant literature surrounding the variables of interest is reviewed, followed by the hypothesized relationships. The measures and methodology by which these relationships were tested are then introduced, and the results of the quantitative analyses are presented. Limitations and opportunities for future research are then addressed before this study's implications for research and practice are discussed.

#### LITERATURE REVIEW

Student engagement has emerged as a critical influencer in higher education [Kahu, 2013; Trowler and Trowler, 2010] and yields benefits for both students and educational institutions. Student engagement develops meaningful relationships across an array of spectrums including student-to-student, student-to-faculty, and student-to-institution relationships [Astin, 1993; Smith et al., 2005]. Student engagement exists in various forms, such as collaborative learning, problem-based learning, student-faculty interaction, and learning opportunities both inside and outside of the classroom [Smith et al., 2005]. Productive outcomes associated with student engagement include academic development, personal development, satisfaction, content knowledge, content retention, and continuous learning skills [Astin, 1991; Carini et al., 2006; Kuh, 2009; Shulman, 2002]. However, the nature of student engagement has been broadly debated [Kahu, 2013; Trowler and Trowler, 2010]. Summarizing the respective literature, Kahu [2013] identifies four distinct domains of research on student engagement, namely the behavioral, psychological, sociocultural, and holistic perspectives.

The behavioral perspective of student engagement emphasizes student behavior and teaching practice as related to student satisfaction and achievement [Kahu, 2013; Kuh, 2009] and views student engagement as a product of the time and energy students dedicate to activities that enrich their educational outcomes and experience [Australian Council for Educational Research, 2010; Kahu, 2013]. Distinguishing between engagement and its antecedents, the psychological perspective views engagement as an internal process and the result of overlapping behavioral, cognitive, emotional, and conative dimensions [Kahu, 2013]. The psychological perspective takes emotional intensity into account, which is often overlooked when assessing student learning [Askham, 2008], and the sociocultural perspective of engagement considers the impact of the broader social context on student experiences. The holistic perspective joins these perspectives into unified construct comprised of the perceptions, expectations, and experience of being and evolving as a student [Bryson, Hardy, and Hand, 2009; Kahu, 2013]. Thus, although efforts to clarify the nature of student engagement are underway, each of these four approaches offers a unique take on the construct.

In this study, we adopt the most widely accepted view of student engagement, the behavioral perspective, and focus on engagement as it pertains to value cocreation through extracurricular activities. Enriching student competencies as well as educational experiences, extracurricular activities occur outside the regular curriculum of the classroom and are voluntary for students [Bartkus et al., 2012; Massoni, 2011]. Extracurricular activities have emerged as chief components of higher education, offering numerous advantages for student participants including higher interpersonal competency skills [Bartkus et al., 2012; Cole et al., 2007; Rubin et al., 2012] and intellectual skills [Lawhorn, 2008; Marinescu, Toma, and Dogaru, 2017], which enhance the perceived employability of students [Marinescu et al., 2017; Pinto and Ramalheira, 2017].

In their survey of employment recruiters, Rynes et al. [2003] found that participation in extracurricular activities is viewed as a positive indicator for leadership and interpersonal skills, and participation in extracurricular activities is positively correlated with the number of job interviews for accounting graduates [Bartkus et al., 2012; Chia, 2005]. Overall, research suggests that student participation in extracurricular activities develops competencies for successful business careers [Bartkus et al., 2012] and increases students' satisfaction with their educational experience [Kaur and Bhalla, 2010; Kaur and Bhalla, 2018; Letcher and Neves, 2010]. As an effective medium for engagement, participation in extracurricular activities presents students with a plethora of benefits, perhaps most notably in the context of value cocreation.

Student engagement is essential for value cocreation, which serves as the foundation for S-D logic [Chathoth et al., 2013; Vargo and Lusch, 2004]. Specifically, S-D logic suggests that stakeholders of a service benefit from the collaborative processes between customers, employees, and partners [Vargo and Lusch, 2004]. Hence, this framework supports both students and educational institutions gaining value from collaborating in learning activities.

Extant research describes value cocreation as the product of two conceptual dimensions, coproduction and value in use [Ranjan and Read, 2016]. Coproduction is characterized by knowledge sharing, equity, and integration between stakeholders [Auh, Bell, McLeod, and Shih, 2007; Etgar, 2008; Fang, Palmatier, and Evans, 2008; Lemke, Clark, and Wilson, 2011; Ranjan and Read, 2016], while value in use is associated with the experience, personalization, and rela-

tionship acquired through the consumers' utilization and maintenance of a service [Randjan and Read, 2016; Sandström, Edvardsson, Kristensson, and Magnusson, 2008]. Initial research on S-D logic defined value cocreation only in terms of coproduction, and the value-in-use dimension was subsequently established after researchers argued that coproduction alone did not fully account for the value of a service [Sandström et al., 2008]. Thus, engagement in actual service delivery falls under the dimension of coproduction, while the ongoing value derived from the service beyond the initial exchange is captured by the value-in-use dimension [Ranjan and Read, 2016]. In the case of higher education, student participation in extracurricular events constitutes as coproduction, and the resulting value from this participation, such as learning experiences and enhanced competencies, is considered value in use.

In addition to value cocreation, marketing literature supplies the construct of WOM behavior as it relates to student engagement. At its core, WOM behavior describes any communication (positive or negative) spread by consumers about firms and firms' offerings [De Matos & Rossi, 2008; Gruen, Osmonbekov, and Czaplewski, 2006; Harrison-Walker, 2001]. These communications include information about products, services, brands, or firms and may be transferred by consumers via myriad mediums, including in person conversation, digital messages, blogs, forums, etc. [Hennig-Thurau, Gwinner, Walsh, and Gremler, 2004]. Like value cocreation, WOM behavior benefits both consumers and firms through knowledge sharing, from which consumers gain information (positive or negative) about a firm's offerings and firms enjoy effective marketing at no costs [Kumar et al., 2010].

Although WOM motivation varies on an individual basis, these communications stem from two primary sources: (1) intentions to benefit the receiver(s) of WOM communication and (2) intentions to meet one's social needs via WOM communication [Karjaluoto et al., 2016; Sheth and Parvatiyar, 1995; Steffes and Burgee, 2009]. WOM communication has been positively linked to customer loyalty, customer satisfaction, and brand love [Brown, Barry, Dacin, and Gunst, 2005; De Matos and Rossi, 2008; Heitmann, Lehmann, and Herrmann, 2007; Hennig-Thurau, Gwinner, and Gremler, 2002; Karjaluoto et al., 2016; Wangenheim and Bayón, 2007]. Pertinent to this study is the relationship between customers' perceived value and WOM activity, as researchers find that value perceptions positively effect WOM behavior [Durvasula, Lysonski, Mehta, and Tang, 2004; Gruen et al., 2006; Hartline and Jones, 1996; Keiningham et al., 2007; McKee, Simmers, and Licata, 2006; Wang, Lo, Chi, and Yang, 2004].

Addressing this relationship in more detail, Wang et al. [2004] describe customer value as the result of four dimensions (perceived sacrifices, functional value, emotional value, and social value), which together produce tangible and intangible customer behavior. Intangible customer behavior is summarized as customer satisfaction and brand loyalty, while tangible customer behavior consists of retention, repurchase, cross-buying, and WOM activity [Karjaluoto et al., 2016; Wang et al., 2004]. Additional extant research asserts that customer participation in service delivery is associated with favorable perceptions of value and WOM communications [Bolton and Saxena-lyer, 2009; Kumar et al., 2010]. In response to the aforementioned literature, this study examines student engagement and value cocreation as they relate to WOM intentions.

In sum, the emergent "student as customer" perspective in higher education underscores the importance of value creation and service delivery in the learning outcome. Consistent with S-D logic, which suggests that customers coproduce value through participation in service delivery, this study examines student engagement through participation in extracurricular events to cocreate the value of their education. For instance, participation in a case study competition may increase a student's presentation and critical thinking skills and also stimulate positive emotions from the experience. These participation outcomes (i.e., skills and experiences) then add to the student's overall satisfaction and value perceptions of their education. Moreover, the value cocreated by students through extracurricular participation may also stimulate positive WOM behavior related to extracurricular activities. Hence, educators can capitalize on student engagement in extracurricular activities, encouraging students to both cocreate their education experience and to recommend fellow students to do likewise.

#### **RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT**

The positive relationship between the perceived value of a product or service and the likelihood of recommending it to a friend has been well established in current literature [Durvasula et al., 2004; Gruen et al., 2006; Hartline and Jones, 1996; Keiningham et al., 2007; McKee et al., 2006; Oh, 1999; Wang et al., 2004]. Recent research reveals that moderating variables of this relationship include experience and price and call for future research of additional factors that enhance the explanatory power of the value-recommendation relationship, as well as for the examination of different customer contexts and industry types [Karjaluoto et al., 2016]. Consistent with these calls and the conceptual underpinnings of the service-dominant logic, we will examine the research model displayed in Figure 1.

#### Faculty Support

S-D logic maintains that the integration of organizational resources (e.g., employees, capital, equipment, products, and so forth) with customers provides the cooperative capabilities to maximize the product or service value offering for customers [Xie, Wu, Xiao, and Hu, 2016]. In the context of higher education, cooperative capabilities can be elicited by engaging students with organizational resources such as faculty, meeting space, and equipment to cocreate educational value. We explore various engagement resources in this study, beginning with



Figure 1. Hypothesized Moderation Relationship

faculty support in specific response to calls for research at the junction of faculty support and extracurricular activities. Accordingly, this study examines the relationship between value perceptions and likelihood to recommend an engagement activity to a friend as a function of faculty support, and we predict that more favorable perceptions of faculty support will yield a stronger relationship between value perceptions and likelihood to recommend that a friend to attend a similar event.

The significance of student-faculty interactions is widely acknowledged in extant literature, and faculty members are often esteemed as the primary agents of impact on students' educational experiences [Kim and Lundberg, 2015]. Supportive student-faculty interactions occur inside and outside of the classroom [Jacobi, 1991; Komarraju, Musulkin, and Bhattacharya, 2010], and interaction outside of the classroom is the most influential form of social interaction [Cox and Orehovec, 2007; Komarraju et al., 2010]. These interactions are especially effective in increasing students' academic development, sense of belonging, motivation, perceptions of support, and, pertinent to this study, engagement which increases overall satisfaction with the learning experience [Goodman and Pascarella, 2006; Kim and Lundberg, 2015; Komarraju et al., 2010]. Using an extracurricular event as a platform for functional student-faculty interaction, we predict that faculty support will strengthen the relationship between student value perceptions and positive word-of-mouth intentions. Specifically, we hypothesize the following:

*Hypothesis 1:* The positive relationship between student value perception and likelihood to recommend a similar extracurricular event to a friend will be positively moderated by the perception of faculty support.

#### Event Format

Engagement is defined in the literature as a product of the time and effort devoted to educationally purposeful activities [Kahu, 2013; Kuh, 2009]. Therefore, an analysis of student engagement should account for the time and effort required to participate in the extracurricular event compared to the perceived value of the activity. Consistent with this definition of engagement, we hypothesize that the format of the event (i.e., time and effort required) will influence the relationship between perceived value and intent to recommend the event to a friend. Specifically, we theorize that more favorable perceptions of event format will yield a stronger positive relationship between value perceptions and likelihood to recommend that a friend attend a similar event.

Research indicates that customer participation does not transpire organically but is the result of organizational socialization, which guides customers to fill cocreation roles [Kelley, Skinner, and Donnelly, 1992; Kotze and Plessis, 2003]. In order to enhance learning outcomes and satisfaction, students must first be given the opportunity to codesign and coproduce their education experience [Kotze and Plessis, 2003]. Hence, students' educational endeavors must be formatted in a way that elicits their participation. Heightening the implications of format, Smith et al. [2005] find that *how* material is delivered and received in some cases exceeds the significance of the curriculum itself.

One such curriculum delivery method is that of the accelerated learning format, which is gaining prevalence in higher education as research indicates that accelerated learning experiences offer parallel and, in some cases, superior learning outcomes [Al-Rawi and Lazonby, 2017; Anastasi, 2007; Daniel, 2000; Kops, 2014; Kucsera and Zimmaro, 2010]. In addition to positive learning outcomes, accelerated learning allots students a better work-life balance and prompts study focus [Burton and Nesbit, 2002]. These intensive learning environments enable students to become deeply immersed in the learning process due to the concentrated time allocation [Al-Rawi and Lazonby, 2017; Colorado College, 2017; Daniel, 2000].

Given the voluntary basis of extracurricular participation, student preference regarding the event format is of utmost importance. Consistent with accelerated learning, extracurricular events often involve intense effort over a concentrated timeframe. Thus, we expect that the format of the extracurricular event will likely elicit the same positive responses and value perceptions as that of the accelerated learning experiences. Applying the concepts of accelerated learning, we examine the impact of extracurricular event format. Specifically, we hypothesize:

*Hypothesis 2:* The positive relationship between student value perception and likelihood to recommend a friend to a similar extracurricular event will be positively moderated by satisfaction with the event format.

#### Awards

Human behavior can be summarized as the result of motivation, which determines the direction and extent to which we exert our energies [Ryan and Deci, 2000a; Shoemaker, 2014]. Motivation is studied as intrinsic and extrinsic in form, as intrinsic motivation stimulates action based on inherent interests for a particular behavior, while extrinsic motivation drives an action based on separable outcomes of that behavior [Anghelcev and Eighmey, 2013; Ryan and Deci, 2000a; Shoemaker, 2014]. Academics have long viewed intrinsic motivation as integral to quality learning and academic performance, casting a disdainful shadow over extrinsically motivated learning [DeCharms, 1968; Ryan and Deci, 2000b; Ryan and Stiller, 1991]. However, as Ryan and Deci [2000b] highlight, students are expected to perform many behaviors that are not inherently interesting or enjoyable in their educational pursuits. While students may be interested in a subject matter, they still rarely enjoy the act of studying or completing an assignment on said matter. Thus, to facilitate motivation for quality student learning, notwithstanding disinterest in behavior, extrinsic awards were introduced to influence the learner.

As participation in an event and recommending an event to a friend require some level of motivation, we draw upon understanding from the motivation literature to facilitate student engagement. Both intrinsic and extrinsic motivators facilitate engagement in activities, such as a learning experience, if they appeal to participants [DeLaney and Royal, 2017]. Consistent with motivation research, offering an extrinsic incentive such as prize money can be a productive use of capital, as S-D logic asserts that organizational resources (e.g., capital) should be integrated with customers to maximize value production via cocreation [Xie et al., 2016]. In this study, we investigate the effect of offering monetary awards at an extracurricular event. Given the value of these awards, we expect value perceptions and satisfaction with the extracurricular event to increase with the potential to earn a monetary reward. Specifically, we hypothesize the following:

*Hypothesis 3:* The positive relationship between student value perception and likelihood to recommend a friend to a similar extracurricular event will be positively moderated by awards.

# EXTRACURRICULAR COCREATION PROJECT: ONE-DAY CHALLENGE

The context of the extracurricular event was a one-day challenge in which students competed for cash prizes at a mid-sized university in the Midwestern United States. This competition was conceptualized and implemented entirely by faculty to document the impact of student engagement for the Association to Advance Collegiate Schools of Business (AACSB) accreditation. Participants were recruited through paper and electronic marketing mediums to participate in an eight-hour Web design challenge (no programming skills required), but the details of what they would be designing were not provided until the competition to prevent work being completed before the event. A total of 57 students registered for the event, forming a total of 17 participating teams.

At the beginning of the challenge, students were instructed that they would have eight hours to design a web interface which collects, organizes, and showcases a portfolio of student accomplishments for prospective employers after graduation. They were also instructed that their designs should be visually appealing and intuitive to use, but no computer programming was needed due to the constrained time of the challenge as well as the disparate skill sets across teams. In addition to creating an engaging design within the eight hours, students were required to prepare two presentations (i.e., one 2-minute presentation and one 5-minute presentation) highlighting their designs. The 2-minute presentations served as an elimination round in which all 17 teams presented to a panel of judges for the opportunity to advance to the final round, in which 10 teams would compete for the prizes.

After the 2-minute presentations, all participants completed a survey instrument while waiting to hear who made it to the final presentations. The timing of this data collection is important because student responses were not biased by whether they advanced to the final round. The 10 teams that were selected to advance to the final round presented their designs in 5 minutes per team to a panel of judges, and the top three teams were awarded cash prizes (see "One Day Challenge Description" in the appendix).

#### Student Participants

Of the 57 students who participated in the challenge, 66 percent were male. Students from 14 majors participated in the event with the majority of participants from computer science/computer information systems (28 percent), marketing (11 percent), English (11 percent), and accounting (9 percent). Thirty-nine percent of the participants were seniors, 31 percent were juniors, and 30 percent were lower-division students.

#### MEASURES

The survey questionnaire was distributed to all student participants after the 2-minute presentation but before the announcement of which teams advanced to the final round. In addition to demographic information, the questionnaire contained survey items which used a 7-point Likert-type scale to measure satisfaction with the event format, faculty support during the event, awards, likelihood of recommending a friend to participate in future engagement events, and overall value of the event. Qualitative feedback was also collected with open-ended questions regarding how students heard about the event, their thoughts on the learning experience, and suggestions for improvements.

		Standard					
	Mean	Deviation	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>
X <sub>1</sub> Perceived Value	5.89	1.3	-				
X <sub>2</sub> Intent to Recommend	6.22	0.99	0.52*	—			
X <sub>3</sub> Faculty Support	6.33	1.16	0.41*	0.26	_		
X <sub>4</sub> Event Format	5.82	1.28	0.28	0.48	0.23	_	
X <sub>5</sub> Awards	6.04	1.12	0.31	0.51*	0.11	0.53*	_

Table 1	. Descriptive	Statistics	for Study	Constructs
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\*Correlation is significant at p < 0.05.

#### RESULTS

The empirical analysis of this study assesses the impact of three design elements of the cocreation experience on the value-recommendation relationship in higher education. The aim of this is to help educational institutions understand the important factors to consider when creating meaningful student engagement experiences. Quantitative analyses were used to examine the conceptually relevant moderators of the relationship between the perceived value of the cocreation experience and the likelihood of recommending that a friend participate in future events. Table 1 contains the descriptive statistics (i.e., means, standard deviations, and measurement correlations) for perceived value, awards, event format, faculty support, and intent to recommend similar events to friends in the future. The extracurricular experience was perceived as a productive and enjoyable experience overall for the students, as the means are all greater than five and most are greater than six on a one (low) to seven (high) measurement scale.

We tested the hypothesized moderated models (see Figure 1) using the Preacher and Hayes [2004] bootstrapping method to generate a sampling distribution for a rigorous test of the hypothesized direct and moderation effects on the dependent variable. This method estimates regression equations for 1,000 samples of the data, and the model effects are estimated from the mean of these estimates [Preacher and Hayes, 2004].

Consistent with Karjaluoto et al. [2016], the moderation analyses were run independently so that only one moderator was tested concurrently. The Process macro [Hayes, 2013] was used in SPSS 24 to assess the hypothesized relationships. The regression equation with which the moderation models were tested was  $Y = i_5 + \beta_1 X + \beta_2 Z + \beta_3 X Z + e_5$ . The results of the three concurrent analyses, displayed in Table 2, show that all three hypothesized variables (i.e., faculty support, event format, and awards) significantly moderate the relationship between perceived value and the likelihood of recommending the experience to friends.

The nature of the interactions is displayed in Figures 2, 3, and 4 by plotting the slopes of responses one standard deviation above and below the mean. Figure

# Table 2. Regression Analyses Testing the Moderating Effect of FacultySupport, Event Format, and Awards on the Relationship between PerceivedValue and Intent to Recommend

					Hypothesis
Hypothesis	Path	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	Supported
H1	Faculty Support $ imes$ Perceived Value	-0.6211	-0.9278	0.1755*	Yes
H2	Event Format $ imes$ Perceived Value	-0.4825	-0.5536	0.1435*	Yes
H3	Awards $ imes$ Perceived Value	-0.5334	-0.5577	0.1507*	Yes

\*Correlation is significant at p < 0.05.

# Figure 2. Interactive Effects of Faculty Support on the Relationship between Perceived Value and Intent to Recommend



#### Figure 3. Interactive Effects of Event Format on the Relationship between Perceived Value and Intent to Recommend



2 displays the interaction effect of hypothesis 1, such that students perceiving high faculty support report significantly higher intentions of recommending the event to friends than students perceiving even moderate faculty support ( $\beta = 0.1755$ , *p*-value < 0.05). Figure 3 displays the interaction effect of hypothesis 2, such that students who highly favor the event format report significantly higher intentions of recommending the event to friends than students who do not favor or moderately favor the event format ( $\beta = 0.1435$ , *p*-value < 0.05). Figure 4 displays the interaction effect of hypothesis 3, such that students who are very satisfied with the potential awards report significantly higher intentions to recommend the event to friends than students perceiving even moderate satisfaction with the potential awards ( $\beta = 0.1507$ , *p*-value < 0.05).

These findings indicate that the level of faculty support, the format of the event, and the awards associated with the competition significantly increase the likelihood that a student will recommend the event to a friend when he/she also

Figure 4. Interactive Effects of Awards on the Relationship between Perceived Value and Intent to Recommend



perceives a high level of value from the experience. In other words, students are much more likely to recruit their friends to engage in these types of experiences if these factors are present.

#### DISCUSSION

Implications for Practice

Extracurricular activities not only enrich the educational experience for students [Bartkus et al., 2012; Chia, 2005; Cole et al., 2007; Rynes et al., 2003], they make students much more marketable after graduation. In fact, experiences outside of the classroom made up four out of the top five attributes employers seek in recent graduates (i.e., extracurricular activities, internships, volunteer experience, and employment during college) [Thompson, 2014]. As a result, the implications of this research are important not only for increasing student's satisfaction with the educational experience, but also for the outcomes they are able to achieve. Crafting effective extracurricular engagement activities is one of the most effective ways of helping students build a stronger value offering for prospective employers.

Furthermore, the findings of this research are relevant for many offices of student affairs, including career services, housing and residence life, Greek life, multicultural centers, religious life, student development, and a host of other student affairs organizations. Student affairs offices seek to develop students into contributing members of our global society by offering programs and services both within and outside of the classroom. The findings of this research indicate that offices of student affairs could cocreate activities with students to resolve a problem on campus or in the surrounding community. Combining student affairs and academic affairs, universities can emphasize service-learning courses, study abroad experiences, student research, and hybrid course structures which create more flexibility for students to gain work experience. This would strengthen students' marketability and improve the relevancy of what they are learning in the classroom. While this study provides evidence of faculty importance in cocreated learning experiences, future research could investigate the extent to which the involvement of professional support staff (such as student affairs and career services staff) necessitate the discovery of new factors to enable effective extracurricular engagement experiences.

Universities could consider cocreation in promotion and marketing efforts, as current students are an excellent source of ideas for capturing the attention of the next generation of students and their parents. Students who value their cocreation experiences, with an intention to recommend them to a friend, should be wellsuited to the recruitment of prospective students. Consequently, universities could engage students in their school recruitment visits. The data associated with cocreation activities can provide insight into future marketing and recruiting efforts. Universities should more fully engage the student population in cocreation activities to better leverage their student body in furthering the mission of the university.

#### Limitations and Future Research

One limitation of this study is the scope of the types of engagement activities analyzed, as the hypothesized moderation relationships could be replicated and tested in different types of extracurricular activities to examine the explanatory power and boundary conditions of student engagement activities. Another limitation of this study is the use of self-report data on intent to recommend an extracurricular event to a friend. Future research could collect an objective measure of WOM by asking event participants who recommended the event and then collecting relevant data from the recommenders. This would remove potential forms of self-report bias in the data. While our focus in this study was on behavioral outcomes, future research should also analyze other contributing factors and outcomes (cognitive, emotional, conative, etc.) of engagement activities. A similar study could be conducted for service-learning activities, faculty-led student research projects, case study competitions, and numerous other extracurricular activities to better understand student willingness to engage in and recommend cocreation learning activities.

Another avenue to be explored is that of value offerings, which serve as extrinsic motivators for participants. While this study offered monetary rewards to top contestants, capital is a naturally constrained resource. Future research could employ alternative value offerings, such as academic credit, certificates, or plaques, and measure their varying effects. Specifically, researchers could examine the impact of these alternatives on the relationship between value perception and word-of-mouth intentions. A similar study could also investigate the effect of value offerings on participants' quality of learning and likelihood to attend the same extracurricular event in the future. Measures of emotional, psychological, and social responses to alternative value offerings could be gathered and examined in relation to learning quality and event satisfaction. Future studies could also manipulate the size and quantity of value offerings and measure the effects on words-of-mouth intentions and/or quality of learning.

Future studies could extend the findings from this research to connect important organizational metrics such as recruitment and retention. Predisposition studies could determine whether the student's prior engagement in extracurricular activities affected their decision to participate in the current events. Future research could also include more attributes in the survey of the learning experience, as well as data collected on the various skills developed during the event. Furthermore, follow-up evaluations could assess whether participation in these extracurricular activities, with their associated accelerated learning and skills development, equated to future employability.

#### CONCLUSION

Undoubtedly, the value of student engagement in higher education should not be ignored, and, as highlighted by Kahu [2013], it is up to all pertinent parties the students, faculty, institutions, and governing bodies—to explore and capitalize on the opportunities for improving student engagement. In this study, students participated in an experiential cocreation event which elicited student engagement and enhanced the learning experience. Using S-D logic, this study provides evidence of the value cocreation events can have for the educational experience of students. Specifically, we find that faculty support, event format, and awards strengthen the relationship between student value perceptions of engagement activities and intentions to recommend the event to friends (i.e., WOM intentions). While creating productive and engaging learning experiences is a challenging endeavor, we offer theory-based empirical evidence of the ability to effectively do so by designing engagement activities that place learners at the center of the educational experience.

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#### APPENDIX

#### **One Day Challenge Description**

Problem/background

RCOB faculty and students are involved in a great number of activities resulting in engagement and impact. These activities and outcomes are not well documented or showcased in the most effective and easy-to-use way. We need a web-based platform to highlight those activities and their impact

#### Challenge

Create an initial design of a web solution to solve the problem and include the following requirements

Content and functionality

Stores and showcases activities and outcomes focused on community impact and engagement (success stories, internships, senior projects, service learning, personal impact, competitions, etc. . . .)

Supports networking/communication between current, past, future students

Showcases student portfolios

Showcases business disciplines through the impact of their students

Includes additional innovative content of your choice with the goal of increasing platform use by students

Impression & aesthetics

Creative platform with functionality that would appeal to students (current and potential new students)

Easy to use, visually engaging, student-centric, web-based, social media rich, and mobile friendly

Ease of use and usefulness

Content categorized to allow for easy navigation (example categories-discipline, activity type, time dimension, etc.)

Content to be perceived useful to current and potential students

#### **Event details**

<u>*How:*</u> Teams (3-5 members) to design and present (2-5min) their solution using presentation software (PowerPoint, Prezi, etc. . . .)

When and where: 2/6/2016, RCOB building, 8:30am-6:30pm

<u>Register your team</u>: Send team member info (names, id number, major, class) to web address by 2/1/2016

<u>Awards\*</u>: First place \$1,000 Second place \$350, Third place \$150 (breakfast, lunch & dinner included)

<u>*Eligibility*</u>: Only registered team members. Registered team members must be present throughout the event on 2/6 to be eligible for awards. Awards are distributed equally among team members

\*See judging criteria for additional details.

### Using the ETS Major Field Test in Business to Predict MBA Performance

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We tested the validity of the Educational Testing Service Major Field Test in Business (MFT-B) as a predictor of Master of Business Administration (MBA) student performance and persistence. In a sample of 203 alumni students, the correlation (corrected for range restriction) between the undergraduate MFT-B and MBA grade point average (GPA) was moderate in size and equal to the correlation between the Graduate Management Admissions Test (GMAT) and MBA GPA. In this alumni sample, neither the MFT-B nor the GMAT provided incremental validity over undergraduate GPA. In a sample of non-alumni MBA students, the GMAT did provide incremental validity over undergraduate GPA.

Keywords: ETS MFT-B, GMAT, MBA Disciplines of Interest: MBA Admissions

#### **INTRODUCTION**

"If I do well on the ETS exam, will that help me get into the MBA program?" This simple question from an undergraduate business student was the inspiration for the current study. As Director of the Master of Business Administration (MBA) Program, my official response was, "No, you have to take the GMAT." However, I immediately wondered if the student's question deserved more serious consideration. Using the undergraduate Educational Testing Service (ETS) Major Field Test in Business (MFT-B) during the MBA admissions process might have at least two advantages. First, the MFT-B is a measure of knowledge of content typically found in undergraduate business courses. It certainly seems likely that scores on the exam might predict performance in graduate business courses. Second, as a measure of business program goals, the MFT-B is often a "low stakes" assessment in which many students lack the motivation to perform at a high level. As a low-cost "ticket" into the MBA program, however, student motivation on the MFT-B might be increased. Thus, this study explores the use of the MFT-B as a predictor of performance in a U.S. MBA program.

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#### **BACKGROUND AND HYPOTHESES**

MBA programs around the world operate in a competitive environment in which they attempt to attract and admit students most likely to be successful in the program and beyond. Most programs use cognitive predictors (e.g. Graduate Management Admissions Test [GMAT], Graduate Record Examination [GRE]) supplemented by other measures, such as work experience, letters of recommendation, etc. The validity of some of these measures has been well-documented. Kuncel, Credé, and Thomas [2007], for example, conducted a meta-analysis of the two most popular predictors and found strong corrected correlations between graduate grade point average (GPA) and the GMAT (p-value = 0.47) and between graduate GPA and undergraduate GPA (p-value = 0.35). In a follow-up study using a better method for correcting for range restriction, Oh, Schmidt, Shaffer, and Le [2008] argued that the correlation with GMAT was underestimated by 6.98 percent and was actually p-value = 0.49. Subsequent studies have also supported the predictive validity of the GMAT and undergraduate GPA [e.g. Christensen, Nance, and White., 2012; Gupta and Turek, 2015; Pesta and Scherer, 2011; Talento-Miller and Rudner, 2008]

These traditional predictors are not without their detractors, however. Pratt [2015] found that the GMAT was not a significant predictor of MBA performance after controlling for undergraduate GPA and work experience. Shepherd, Douglas, and Fitzsimmons [2008], argued that the GMAT might discriminate against those with a more entrepreneurial mind-set. Kass, Grandzol, and Bonner [2012] found that the GMAT and undergraduate GPA predicted MBA GPA, but they did not predict managerial competencies, such as communication, teamwork, and leadership initiative. Finally, Dreher, and Ryan [2004] argued that work experience is a poor predictor of MBA program grades or post-MBA career outcomes.

Given this previous research, there seems to be some consensus that GMAT scores and undergraduate GPA are valid predictors of MBA outcomes such as graduating GPA. However, the search continues for other predictors that might provide stronger validity or might predict alternative outcomes.

The MFT-B was developed by Educational Testing Service (ETS) as a measure of knowledge of content typically covered in undergraduate business programs. The test includes questions from the domains of accounting, economics, management, quantitative business analysis, information systems, finance, marketing, legal and social environment, and international issues. The test is used for a variety of purposes, but many colleges have adopted the test as a measure of student learning outcomes that are often required for accreditation purposes [Bielinska-Kwapisz and Brown, 2014; Ling, Bochenek, & Burkander, 2015]. The ETS has also created a graduate version of the MFT-B that is often used for program assessment purposes in MBA programs [Kass and Grandzol, 2014].

Although thousands of undergraduate students take the MFT-B each year, and many of them simultaneously apply for admission to MBA programs, it is unknown how many schools consider MFT-B scores in the MBA admissions process or whether MFT-B scores predict student performance in MBA programs. Given the overlapping content between undergraduate and graduate business programs, it certainly seems plausible that MFT-B scores would predict content knowledge in MBA programs. In fact, numerous studies have shown that performance on the MFT-B is predicted by undergraduate GPA [Ling, Bochenek, and Burkander, 2015]. Moreover, Ketcham, Nigro, and Roberto [2018] recently found that performance on the test is related to measures of passion and persistence in undergraduate business courses. Thus, the following hypothesis is proposed:

*H1:* There is a positive correlation between undergraduate MFT-B scores and MBA GPA.

It also seems plausible that the MFT-B will provide incremental validity beyond undergraduate GPA and GMAT scores. With respect to undergraduate GPA, grading standards and curricula may vary quite a bit across universities. This variability makes it unclear exactly what underlying traits are being measured by undergraduate GPA. The GMAT provides a more standardized assessment than undergraduate GPA, but it focuses on higher-order quantitative skills and higher-order verbal skills. There is no business-specific content in the GMAT. The MFT-B, however, tests for specific business knowledge in a set of content areas that should be fairly common across undergraduate business disciplines. Therefore, the MFT-B has the advantage of being more standardized than undergraduate GPA and of having more content validity than the GMAT. Thus, the second hypothesis is:

*H2:* The MFT-B will provide incremental validity in predicting MBA GPA after controlling for undergraduate GPA and GMAT scores.

In addition to predicting MBA GPA, universities might also want to predict the likelihood that a student will complete the program. Kuncel, Credé, and Thomas [2007] found that undergraduate GPA and the GMAT were relatively weak, but positive, predictors of MBA program completion (p-value = 0.11 and p-value = 0.17, respectively). If the MFT-B reflects knowledge and motivational traits necessary for success at the graduate level, it may also predict successful completion of an MBA program. Thus, these additional hypotheses are offered:

*H3:* There is a positive correlation between undergraduate MFT-B scores and MBA graduation.

*H4:* The MFT-B will provide incremental validity in predicting MBA graduation after controlling for undergraduate GPA and GMAT scores.

#### METHOD

#### Participants

Archival data were collected from 203 MBA students who also attended the same university as an undergraduate. This alumni sample was 51.2 percent female, and the average age when starting the program was 23.95. For comparison purposes, data were also collected from a sample of 332 non-alumni MBA students. This sample was 60.8 percent male, and the average age was 24.27 years.

#### Measures

At this university, undergraduate students typically take the MFT-B exam in their final semester. Individual scores were extracted from the university's dedicated ETS portal and paired with institutional data via student identification numbers. Undergraduate GPAs, GMAT scores, MBA GPAs, and graduation records were contained in the institutional archival data. Currently enrolled students were included in the tests of Hypotheses 1 and 2 if they had completed at least 15 hours (i.e. one-half of the program). Students were included in the tests of Hypotheses 3 and 4 if they had begun the program more than 4 years earlier (i.e. they should have finished the program but had not) or if they had completed the program.

#### RESULTS

Correlations between all study variables can be found in Table 1. Consistent with previous research, undergraduate GPA and GMAT scores are significantly correlated with MBA GPA. As predicted in Hypothesis 1, the MFT-B is significantly correlated with MBA GPA (r = 0.20, *p*-value < 0.01). Table 2 shows the predictor-MBA GPA correlations corrected for indirect range restriction. As explained by Oh et al. [2008], predictor–criterion relationships may be underestimated when there is range restriction on the predictor. Most MBA programs, for example, have a minimum GMAT score required for admission. Correlations between the GMAT and MBA GPA based on a sample of students, therefore, will be based on a restricted sample and, thus, underestimated. Kuncel, Credé, and Thomas [2007] corrected for this range restriction assuming direct range restriction [Thorndike, 1949]. Oh et al. [2008], however, explained that virtually all admissions decisions involve indirect range restriction because they use multiple predictors.

Range restriction is measured by comparing the standard deviation of the predictor in the restricted sample with the standard deviation of the predictor in the unrestricted population [Hunter, Schmidt, and Le, 2006]. In this sample, for example, the MFT-B standard deviation is 12.24, and the population standard

Alumni											
Sample	Mean	S.D.	Min	Max	1	2	3	4	5	6	7
1. Sex <sup>a</sup>	0.49	.59	0	1	_						
2. Age	23.95	5.21	22	37	02	_					
3. UGPA	3.46	.37	2.51	4.00	31**	01	-				
4. GMAT	505.57	73.88	310	730	.16*	04	.18**	_			
5. MFT-B	156.58	12.24	125	190	.03	10	.32**	.60**	_		
6. MBA GPA	3.57	.29	1.00	4.00	10	.08	.53**	.19**	.20**	-	
7. Graduated	0.93	.26	0	1	02	.03	.17*	.11	.07	.23**	_

Table 1. Correlations and Descriptive Statistics for Study Variables

Note: N=203.

Non-Alumni Sample	Mean	S.D.	Min	Max	1	2	3	4	5	6	7
1. Sex <sup>a</sup>	0.61	.49	0	1	_						
2. Age	24.27	5.09	22	54	.01	_					
3. UGPA	3.29	.42	2.31	4.00	18**	.05	_				
4. GMAT	532.02	70.11	300	730	.11*	04	.08	-			
5. MFT-B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-		
6. MBA GPA	3.60	.33	1.00	4.00	01	05	.32**	.28**	N/A	_	
7. Graduated	0.82	.39	0	1	.05	07	.05	.13*	N/A	.45**	_

Note: N=332. GMAT, Graduate Management Admission Test. MBA GPA, graduate grade point average. MFT-B, Major Field Test in Business. UGPA, undergraduate grade point average.

<sup>*a*</sup>Sex: 0 = Female, 1 = Male. \*p < .05. \*\*p < .01.

deviation is 14.93 [Ling, 2012], resulting in a range restriction factor of 0.82. This example of indirect range restriction results from the intercorrelations between the MFT-B, undergraduate GPA, and the GMAT. In other words, admitting students based on explicit minimums for undergraduate GPA and GMAT scores results in a smaller distribution of scores on the MFT-B. The corrected correlations in Table 2, therefore, are based on the procedure described by Hunter, Schmidt, and Le [2006]. These corrected correlations show a very strong relationship between MBA GPA and undergraduate GPA (p-value = 0.72) and moderate relationships with the GMAT (p-value = 0.28) and MFT-B (p-value = 0.28).

Table 3 shows the regression results with and without MFT-B. In Model 1, undergraduate GPA is the only significant predictor of MBA GPA. Contrary to Hypothesis 2, there is no significant change in  $R^2$  when MFT-B is added in Model 2. These results do make sense, given the strong correlations between MFT-B, undergraduate GPA, and the GMAT. The GMAT and MFT-B, although significantly correlated with graduate GPA, apparently offer no incremental validity in this sample.

Winter 2019

#### Table 2. Correlations Between Predictors and MBA GPA Corrected for Indirect Range Restriction

	Uncorrected Correlation with MBA	Estimated Reliability	Range Restriction	Estimated Reliability	Corrected
Predictor	GPA	of MBA GPA	on Predictor	of Predictor	Correlation
Alumni Sample					
UGPA	0.53	0.83 <sup>a</sup>	$0.78^{\rm a}$	0.83 <sup>a</sup>	.72 <sup>e</sup>
GMAT	0.19	0.83 <sup>a</sup>	0.77 <sup>c</sup>	0.92 <sup>b</sup>	.28 <sup>e</sup>
MFT-B	0.20	0.83 <sup>a</sup>	0.82 <sup>c</sup>	0.89 <sup>d</sup>	.28 <sup>e</sup>
Non-Alumni					
Sample					
UGPA	0.32	0.83 <sup>a</sup>	$0.78^{\rm a}$	0.83 <sup>a</sup>	.48 <sup>e</sup>
GMAT	0.28	0.83 <sup>a</sup>	0.73 <sup>c</sup>	0.92 <sup>b</sup>	.43 <sup>e</sup>

Note: GMAT, Graduate Management Admission Test. MBA GPA, graduate grade point average. MFT-B, Major Field Test in Business. UGPA, undergraduate grade point average.

<sup>*a*</sup>These values are the same values used by Kuncel et al. [2007] and Oh et al. [2008]. <sup>*b*</sup>This value is the same value used by Oh et al. [2008].

<sup>c</sup>These values were derived from our sample data and MFT-B population data [Ling, 2012].

<sup>d</sup>This value represents MFT-B population data [Ling, 2012].

<sup>e</sup>These values are corrected for unreliability and indirect range restriction using the method described by Hunter et al. [2006].

	Alumni Model 1	Alumni Model 2	Non-Alumni Model
	β	β	β
Sex	.050	.050	.023
Age	.093	.091	052
UGPA	.527**	.533**	.304**
GMAT	.085	.101	.247**
MFT-B		028	
$R^2$	.295	.296	.166
F for $\Delta R^2$	20.75**	.133	16.29**

Table 3.	Regression	Results	Predicting	MBA	Grade	Point	Average
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Note: GMAT, Graduate Management Admission Test. MFT-B, Major Field Test in Business. UGPA, undergraduate grade point average. \*p < .05 \*\*p < .01.

With respect to Hypothesis 3, Table 1 shows that MFT-B is not significantly correlated with program completion. Consistent with Kuncel, Credé, and Thomas [2007], Table 4 shows that, after correcting for range restriction, undergraduate GPA is moderately correlated with completion (p-value = 0.25), but the GMAT

#### Table 4. Correlations Between Predictors and Graduation Corrected for Indirect Range Restriction

	Uncorrected Correlation with	Estimated Reliability of	Range Restriction	Estimated Reliability of	Corrected
Predictor	Graduation	Graduation	on Predictor	Predictor	Correlation
Alumni Sample					
UGPA	0.17	1.00 <sup>a</sup>	0.78 <sup>a</sup>	0.83 <sup>a</sup>	0.25 <sup>e</sup>
GMAT	0.11	1.00 <sup>a</sup>	0.77 <sup>c</sup>	0.92 <sup>b</sup>	0.15 <sup>e</sup>
MFT-B	0.07	1.00 <sup>a</sup>	0.82 <sup>c</sup>	0.89 <sup>d</sup>	0.09 <sup>e</sup>
Non-Alumni					
Sample					
UGPA	0.05	1.00 <sup>a</sup>	$0.78^{\rm a}$	0.83 <sup>a</sup>	0.07 <sup>e</sup>
GMAT	0.13	1.00 <sup>a</sup>	0.73 <sup>c</sup>	0.92 <sup>b</sup>	0.19 <sup>e</sup>

Note: GMAT, Graduate Management Admission Test. MFT-B, Major Field Test in Business. UGPA, undergraduate grade point average.

<sup>a</sup>These values are the same values used by Kuncel et al. [2007] and Oh et al. [2008]. <sup>b</sup>This value is the same value used by Oh et al. [2008].

<sup>c</sup>These values were derived from our sample data and MFT-B population data [Ling, 2012].

<sup>d</sup>This value represents MFT-B population data [Ling, 2012].

<sup>e</sup>These values are corrected for unreliability and indirect range restriction using the method described by Hunter et al. [2006].

(p-value = 0.15) and the MFT-B (p-value = 0.09) are relatively weak predictors. Table 5 shows the results of a logistic regression predicting program completion. None of the predictors meets conventional levels of significance, but consistent with the previous analyses, undergraduate GPA comes the closest to having any predictive value. Hypotheses 3 and 4 were not supported.

#### DISCUSSION

Consistent with previous research, the results of this study show significant bivariate correlations among undergraduate GPA, the GMAT, and MBA GPA. In addition, the results show a corrected correlation between the MFT-B and MBA GPA equal to the corrected correlation between the GMAT and MBA GPA. This finding suggests that the MFT-B may have similar value as a predictor in the MBA admissions process.

In this particular sample, the MFT-B (like the GMAT) did not provide incremental validity after controlling for undergraduate GPA. Before concluding that undergraduate GPA should be the sole predictor of graduate GPA, it is worth considering some alternative possibilities. First, although a few

	Alumni Model 1	Alumni Model 2	Non-Alumni Model
	B(SE)	B(SE)	B(SE)
Sex	.10 (.83)	.08 (.83)	.19 (.33)
Age	.04 (.07)	.04 (.07)	03 (.03)
UGPA	1.79 (1.04)†	1.90 (1.07)†	.42 (.37)
GMAT	.01 (.01)	.01 (.01)	.01 (.00)†
MFT-B		02 (.05)	
Constant	-7.46 (4.88)	-5.63 (6.48)	-2.02 (1.85)

Table 5.	Logistic	Regression	Results	Predicting	Graduation

Note: GMAT, Graduate Management Admission Test. MFT-B, Major Field Test in Business. UGPA, undergraduate grade point average. \* $p < .05 **p < .01 \dagger p < .10$ .

studies have likewise found that the GMAT did not provide incremental validity [Pratt, 2015], a large meta-analysis found that the GMAT did provide more accurate predictions than undergraduate GPA alone [Talento-Miller and Rudner, 2008]. Moreover, the present study included only students who had attended the same university for both undergraduate and graduate degrees. It seems likely in such a situation that the correlation between undergraduate GPA and MBA GPA may be inflated because of the familiarity of students and faculty with each other. If this is the case, the inflated relationship may have obscured any incremental validity produced by the GMAT or MFT-B.

This possible explanation was tested with a non-alumni sample. Table 2 shows that the corrected correlation between undergraduate GPA and MBA GPA was lower in the non-alumni sample than in the alumni sample (p-value = 0.48 versus p-value = 0.72). Also, the GMAT was a stronger predictor of MBA GPA in the non-alumni sample than in the alumni sample (p = 0.43 versus p-value = 0.28). Table 3 shows that the GMAT adds incremental validity to the prediction of MBA in the non-alumni sample, whereas it does not in the alumni sample. Of course, the incremental validity of the MFT-B in the non-alumni sample could not be tested because these scores are not routinely collected in the admissions process or reported to schools on behalf of MBA applicants by ETS.

These serendipitous findings offer a potential avenue for future research. Specifically, are there different predictors of MBA success in alumni and nonalumni students? The results of this study suggest that undergraduate GPA may provide the best available means to predict the MBA performance of alumni students. When it comes to non-alumni, however, the standardized nature of the GMAT may provide incremental validity over undergraduate GPAs derived from disparate universities. Given that the MFT-B provided the same predictive power that the GMAT provided in the alumni sample, it seems plausible to hypothesize that the MFT-B may also offer incremental validity over undergraduate GPA in non-alumni samples. A test of this hypothesis will depend on wider availability of MFT-B scores. Perhaps ETS could offer students the option of reporting these scores to MBA programs.

This study should be interpreted in light of its limitations. As mentioned above, the primary hypotheses could be tested using only students who earned business degrees from the same university. However, this limitation reflects a real-world practical problem with using MFT-B scores for MBA admissions. Because the MFT-B is most often used for internal program assessment purposes, there is no reporting mechanism like the one used to report GMAT scores. Future research should examine the predictive validity of the MFT-B in a more heterogenous environment with students from a variety of universities. This study also failed to find any significant predictors of program completion. This failure is not unexpected, however, because program completion has been only weakly related to cognitive predictors in previous research and may depend on more noncognitive factors.

In spite of these limitations, this study is apparently the first to examine the predictive validity of the MFT-B as a predictor of MBA performance. It is also uncommon for such validity studies to correct for indirect range restriction [Oh et al., 2008]. This study is also unique in finding that predictors of alumni performance may differ from predictors of non-alumni students. Considering the size of the relationship reported here, the MFT-B appears to offer the same value provided by the GMAT that an admissions test into MBA programs provides. If the MFT-B can serve "double duty" as an undergraduate program assessment tool and a predictor of MBA performance, universities might find ways to increase student motivation on the test while also improving the accuracy of their MBA admissions processes.

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#### Winter 2019

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## Budget Habits of College Students: An Empirical Analysis of Expectations and Realizations

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Using a sample of more than 500 college students from a large, private university, this study sought to analyze spending expectations of students, their realized habits, and the dispersion between the two. We first asked the students to project what they thought their monthly budget would be throughout the semester. We then asked them to track their expenses for three months. The students did the same for income they received. The students then reported their actual spending habits and answered various questions related to their demography, family, and life experience. We used simple univariate correlation methods to explain factors that may have influenced their expected income and spending as well as their actual income and spending. Additionally, we considered the association specifically between these factors and credit spending, both projected and realized. Using the same estimation method, we determined the degree to which a student adhered to a personal budget, which is known as expenditure dispersion. We then estimated a multivariate model on expenditure dispersion. Our findings identify factors that predispose college students to favorable and unfavorable budget outcomes.

Keywords: Budgeting, Personal Finance, College Students, Financial Planning

**Disciplines of Interest:** Finance, Financial Literacy, Personal Finance, Family Finance

#### INTRODUCTION

William E. Gladstone once said, "Budgets are not merely affairs of arithmetic, but in a thousand ways go to the root of prosperity of individuals, the relation of classes

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and the strength of kingdoms" [Cleveland, 1919]. On the other hand, George W. Bush is reported as once saying, "It's clearly a budget. It's got a lot of numbers in it" [Reuters, 5 May 2000]. The difference between these two excerpts underscores the contrasting opinions people have on budgeting—budgeting is both imperative to being successful and a frustrating mechanism for constraint.

A large university campus provides a natural experiment for a budgeting study with a focus on financial literacy. To measure budgeting habits, we asked a sample of more than 500 college students in an introductory finance course to report projected and realized income and spending over a 3-month period. The students answered questions in categories ranging from personal income to money spent on airfare, with 9 categories for income and 27 categories for expenditures. Though it is not the main scope of this paper, grouping income and expenditures by variable allows for examination of both student spending habits and financial independence. The students also answered a survey to provide data on their demographic and family background. Similar survey methods were used in Brau JC, Brau R, Owen, and Swenson [2016], Brau JC, Brau R, Rowley, and Swenson. [2017], and Brau JC, Brau BJ, and Holmes [2019].

To begin our analysis, we first used Spearman correlations to determine the pairwise associations among expected income, expected spending, actual income, and actual spending, with a set of factors derived from the survey. We also measured the correlation between the independent variables and the dispersion between expected and realized spending, which was the variable that held the most importance to us. This variable represented whether a student had a personal budget deficit or a surplus.

Out of these correlations, the following independent factors were deemed to have a statistically significant association with one of the aforementioned dependent variables: having a college-graduate parent, having parents who earned less than \$30,000 annually, having been involved in financial decisions when growing up, reading business news regularly, having had a job in high school, having a checking account for five or more years, having invested in the stock market, owning two or more credit cards, paying for at least 50 percent of one's own college expenses, and having paid for some or all personal expenses in high school.

We also used Spearman correlations to show the association between each independent variable and expenditures using a credit card, both the projected and realized amounts. We did this largely because of the focus given to credit spending by Hayhoe, Leach, Turner, Bruin, and Lawrence [2000].

At this stage, we then estimated a multivariate model, taking an ordinary least squares (OLS) approach to estimate the marginal effect of each independent variable on expenditure dispersion. We hypothesized that the variation in independent factors would explain the variance in the designated dependent variable. It follows that typical budget variance reflected unpredictable factors that cause an individual to spend more (or less) than one expects in a personal budget. In connection with our testing, we found explicit factors that statically demonstrate a high level of predictability of outcomes with regard to expenditure dispersion and student budgeting behavior. Ultimately, we found that having a college-graduate parent and having parents who earned less than \$30,000 a year to be statistically significant in the model, with spending dispersion as the dependent variable.

We next introduced an additional control on the multivariate model, in which we restricted the data set to include only the values of students who we believed were taking the exercise the most seriously. We measured this by taking the absolute value of the difference between the variables for actual income and actual spending and the variables for projected income and projected spending. Our results were robust for this alternative specification.

#### LITERATURE REVIEW

The increased financial burden on students to obtain a college degree was recently highlighted in Lucca, Nadauld, and Shen [2019]. They used econometric identification strategies to show causality between increases in federal student loan programs and increases in tuition. Lucca, Nadauld, and Shen [2019] show that for each dollar of increased student loans, tuition was raised 60 cents for subsidized loans and 20 cents for unsubsidized loans. That is, colleges and universities raise their tuition because the federal government was making larger amounts of student loans available and easier to get. In the midst of this increasing lending capacity and higher tuition, student budgeting and financial discipline are important subjects to study.

In examining how college students manage their finances, Henry, Weber, and Yarbrough [2001] found that women were more likely to have budgets, and married students were more likely to follow their budgets. Older students, age 36–40, however, were the most likely to follow their budgets most of the time. Their study consisted of 126 students, wherein 84 percent of the sample were female, average income was just below \$16,000, and average debt was found to be \$13,000. Henry, Weber, and Yarbrough [2001], noticed a conspicuously high level of debt on average and found that 40 percent of undergraduate students and 96 percent of graduate students participating in the study had some amount of debt.

Hayhoe et al. [2000] focused their research specifically on credit card spending among college students. Between the years 1988 and 1990, the number of undergraduate students with a credit card increased by over 30 percent; in fact, during the time that this study took place, 70-80 percent of all college students were estimated to have at least one credit card. Furthermore, a study by Xiao et al. [1995] found that 82 percent of the 480 people surveyed had positive attitudes on credit card use. Davies and Lea [1995] found that college students' attitudes toward incurring debt remarkably changes from when they begin college to the time they complete their undergraduate degrees.
First, Hayhoe et al. [2000] considered the impact of gender on credit use and then the impact of credit use on purchasing and financial management behaviors. This line of inquiry is consistent with Williams et al. [1991] who showed that men were less likely than women to have a budget; keep financial records; plan, order, and sequence spending; set aside time for financial management work; pay finance charges; carry through financial plans; and shop for best buys. Bruin, Muskie, and Swift [1997] found that credit cards were most commonly used for school supplies, gasoline, travel, and small personal items.

Poor prior credit usage does not seem to lead to personal implementation of additional financial management practices, such as budgeting [Walker, 1996]. According to Musk and Winter [1998], a budget plan should go beyond the extent of credit card statement reconciliation and requires regular generation of financial statements; budgeting; control of spending; recording income, expenses, taxes, and insurance; investment; and retirement and estate planning.

Hayhoe et al. [2000] used logit models and showed that age, marital status, and gender were all significant beyond the 0.05 level, with a written budget as the binary dependent variable. They also included a number of findings about particular spending habits among the sexes: females in the study used credit cards to buy clothing more often than males did, and males used credit cards more often than females for electronics, entertainment, and food away from home. These results are consistent with a finding by Dittmar, Beattie, and Friese [1996] that women spent more on appearance, whereas men spent more on leisure activities.

Furthermore, Hayhoe et al. [2000] found gender to be statistically significantly correlated with a number of financial practices as the dependent variable, including having a written budget, shopping with a list, keeping bills/receipts, and saving on a regular basis—in each of these cases, women were more likely to say that they did them. In general, a higher number of credit cards with a balance were correlated with lack of financial management practices.

Not all academic literature argues that budgets create value, though this literature pertains mostly to corporate budgets. Hope and Fraser [2003] argue that budgeting (among firms) caused ineffective behavior and wasted management time, ultimately leading to firms not keeping up with competition; because of this, they argued that budgeting is a fundamentally flawed practice and should be done away with (as cited in Libby and Lindsay [2010]). Also, some accounting studies describe the potential negative effects that arose when firms blindly linked budgets to performance evaluation techniques [Merchant, 1990].

Libby and Lindsay [2010] conducted a survey through the membership directories of Certified Management Accountants of Canada and the Institute of Management Accountants in the United States. The survey included only firms with a vice president, CFO, director of budgeting, or a division manager. Out of the approximately equal subsamples of manufacturing and service sector firms, 79 percent used budgets for control [Libby and Lindsay, 2010]. In Libby and Lindsay [2010], 94 percent of firms surveyed planned on maintaining their budgeting

practices; however, 46 percent of Canadian firms stated that they wanted to change their budgeting practices within the ensuing two years.

#### **DATA AND METHODS**

We used a sample of 508 students in an introductory finance class at a large private western U.S. university. The survey first asked students a series of control questions in four principal categories. These categories are referred to in this study as demography, family, financial knowledge, and life experience. In the demography category, students were asked for their age range (e.g. under 17, 18–20, etc.), gender, whether or not they were international, how long they had been married (students could respond that they were not married), number of children (students could respond that they had no children), and academic standing (first-year, sophomore, junior, or senior).

In the category for family information, students were asked if they had a parent who is a college graduate, if they received an allowance as a child, the income range of their parents, and the degree to which they were involved in financial decisions in the home when growing up.

For the financial background questions, students were asked if they had taken a high school finance, high school accounting, or college accounting course; if they read business news such as the *Wall Street Journal* on a regular basis; if they watched business news videos; and if they were enrolled in one of the four main business disciplines offered at the university (management, finance, accounting, or information systems).

Finally, regarding their life experiences, students were asked if they had a job in high school, how long they had a checking account (not having one was also an option), if they had invested in the stock market, how many credit cards they had (if any), the percentage of college expenses they themselves paid, and the portion of high school expenses they themselves paid.

As part of an initial assignment at the beginning of the semester, students were asked to project their income and expenditures for the following three months in a series of categories and enter the data into a survey. Students then tracked their actual income and expenditures throughout that period in those same categories over the next three months. In the second half of the survey, students entered the exact numbers from the assignment for their realized income and expenditures. Within the greater category of income, students recorded their projected and realized income in the following categories: personal income, spouse income, cash savings (money already in a student's checking account, for example), parent income (money that a student's parents gave the student throughout the course of the assignment), financial aid, grants, loans, social security payments, and a miscellaneous income category. Projected and realized expenditures were recorded in the following 27 categories: tuition, school books, rent, utilities, phone, internet, groceries, fast food, car payment, car

insurance, gas, car repairs, airfare, medical insurance, medical co-pay, clothing, grooming, laundry, gifts, entertainment, charitable donations, credit card payments, miscellaneous debt payments, life insurance expenses, money set aside for savings, vacation expenses, and a category for any other payments not listed.

In Table 1 we report the sample descriptive statistics. Approximately half of these variables had the full 508 observations. The other half had between five and nine missing observations. Perhaps out of reluctance to disclose hints at their socioeconomic upbringing, parent income was missing the most observations at nine. To generate interpretable results from our regressions, we turned each variable with more than a yes-or-no response into dummy variables for each of its responses. We show indicator variable results for the following variables: age, academic standing, checking account, credit cards, percentage of college expenses paid for by the student, how long the student has been married (if married at all), how many children (if the student has children), combined income of the student's parents, degree to which parents involved the student in financial decisions in the home, and how much of the student's high school expenses were paid for by the student.

Students ages 21–23 were the largest age group at 55.9 percent of the sample. Juniors and seniors made up 41.5 percent and 43.9 percent of the sample, respectively. Students who had a checking account for at least five years made up 57.1 percent. Students with exactly one credit card made up 41.1 percent. Students who paid 100 percent of their college expenses were the largest group in that category at 38.6 percent. Unmarried students made up 65.3 percent of the sample. The vast majority of students (92.3 percent) had no children. The most common income bracket for students' parents was that of \$100,000–200,000 per year (27.8 percent), which indicates that parents' income was fairly evenly distributed in the sample, although a plurality of the students were from relatively higher income families. The most common category for involvement in financial decisions in the home was the self-report of "seldom" being involved (45.7 percent). A clear majority (67.1 percent) of the students reported having paid "some" of their high school expenses.

The indicator variables we used in univariate correlations as well as our regressions included each dummy variable originally taken from the survey in addition to the following selection of variables from the newly binary assortment: being at least 24 years old; being an upperclassman (junior, senior, or graduate student); having a checking account for at least five years; owning at least two credit cards; paying for at least 50 percent of college expenses; being married; having at least one child; parents earning less than \$30,000 per year; being either seldom, usually, or often involved in financial decisions growing up (as three separate variables); paying some of amount of high school expenses; and paying 100 percent of high school expenses.

Table 2 reports the summary statistics for each of the projected and realized budget variables. Due to outliers, all variables dealing with student budgeting

Variable	N	Mean	Median	Std Dev	Min	Max
Female	508	0.268	0	0.443	0	1
HS Finance	508	0.106	0	0.309	0	1
HS Accounting	508	0.154	0	0.361	0	1
Col. Accounting	508	0.919	1	0.273	0	1
Read Business	508	0.287	0	0.453	0	1
TV Business	508	0.079	0	0.270	0	1
Parent Attend College	508	0.839	1	0.368	0	1
Allowance	508	0.470	0	0.500	0	1
HS Job	508	0.624	1	0.485	0	1
Stock Market	508	0.260	0	0.439	0	1
International	508	0.108	0	0.311	0	1
Age 24+	508	0.303	0	0.460	0	1
Upperclassman	508	0.856	1	0.351	0	1
2+ Credit Cards	508	0.352	0	0.478	0	1
50+% College Exp. Paid by Student	508	0.736	1	0.441	0	1
Married	508	0.331	0	0.471	0	1
1+ Children	508	0.061	0	0.240	0	1
Age 18-20	508	0.128	0	0.334	0	1
Age 21-23	508	0.559	1	0.497	0	1
Age 24-26	508	0.254	0	0.436	0	1
Age 27-29	508	0.039	0	0.195	0	1
Age 30+	508	0.010	0	0.099	0	1
Freshman	508	0.006	0	0.077	0	1
Sophomore	508	0.128	0	0.334	0	1
Junior	508	0.415	0	0.493	0	1
Senior	508	0.439	0	0.497	0	1
Graduate	508	0.002	0	0.044	0	1
No Checking Account	508	0.010	0	0.099	0	1
Checking Account 1 Year	508	0.018	0	0.132	0	1
Checking Account 2–3 Years	508	0.146	0	0.353	0	1
Checking Account 4–5 Years	508	0.242	0	0.429	0	1
Checking Account 5+ Years	508	0.571	1	0.495	0	1
No Credit Cards	508	0.226	0	0.419	0	1
1 Credit Card	508	0.411	0	0.493	0	1
2 Credit Cards	508	0.201	0	0.401	0	1
3 Credit Cards	508	0.102	0	0.303	0	1
4 Credit Cards	508	0.033	0	0.180	0	1
5+ Credit Cards	508	0.016	0	0.125	0	1

# Table 1. Descriptive Statistics

Variable	N	Mean	Median	Std Dev	Min	Max
0% College Exp. Paid by Student	508	0.083	0	0.276	0	1
1-25% College Exp. Paid by Student	508	0.169	0	0.375	0	1
26%–50% College Exp. Paid by Student	508	0.120	0	0.325	0	1
51%–75% College Exp. Paid by Student	508	0.102	0	0.303	0	1
76-99% College Exp. Paid by Student	508	0.128	0	0.334	0	1
100% College Exp. Paid by Student	508	0.386	0	0.487	0	1
Not Married	508	0.654	1	0.476	0	1
1 Year Married	508	0.197	0	0.398	0	1
2–3 Years Marr.	508	0.114	0	0.318	0	1
4–5 Years Marr.	508	0.014	0	0.117	0	1
5+ Years Marr.	508	0.006	0	0.077	0	1
No Children	508	0.923	1	0.266	0	1
1 Child	508	0.039	0	0.195	0	1
2 Children	508	0.016	0	0.125	0	1
3+ Children	508	0.006	0	0.077	0	1
Parents Income < \$30k	508	0.079	0	0.270	0	1
Parents Income \$30–50k	508	0.120	0	0.325	0	1
Parents Income \$50-85k	508	0.175	0	0.381	0	1
Parents Income \$85–100k	508	0.154	0	0.361	0	1
Parents Income \$100–200k	508	0.278	0	0.448	0	1
Parents Income > 200k	508	0.177	0	0.382	0	1
Never Involved in Family Fin Decisions	508	0.311	0	0.463	0	1
Seldom Involved in Family Fin Decisions	508	0.457	0	0.499	0	1
Usually Involved in Family Fin Decisions	508	0.152	0	0.359	0	1
Often Involved in Family Fin Decisions	508	0.071	0	0.257	0	1
0% HS Exp. Paid by Student	508	0.098	0	0.298	0	1
Some HS Exp. Paid by Student	508	0.671	0	0.470	0	1
100% HS Exp. Paid by Student	508	0.220	0	0.415	0	1

Table	1.	Descriptive	<b>Statistics</b>	(continued)
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practices have been winsorized at the 98 percent level. For projected income variables, the variable with the highest mean was cash savings. The average spouse income was \$287.85 per month. It is important to note, however, that the median value for spouse income was zero. This difference is explained by the fact that most students were not married and therefore did not have a spouse income. The projected expenses variable with the highest mean was rent of \$422.02 and a median of \$320.00. The realized income variable, with the highest mean value was also cash savings with a mean of \$1,223.20, followed by spouse income, with a mean of \$284.84. The realized expense variable with the highest mean was rent, with a mean value of \$418.37.

	Projected Budget Variables					Actual Budget Variables						
Variable	N	Mean	Median	Std Dev	Min	Max	N	Mean	Median	Std Dev	Min	Max
Personal Income	468	59.4	1	212	0	1379	467	885.1	465	2537	0	19179
Spouse Income	469	287.9	0	646	0	3600	469	284.8	0	648	0	3600
Cash	468	1255.9	3	2920	0	15280	469	1223.2	3	2797	0	15000
Parent Income	471	171.1	0	359	0	2000	471	207.3	0	429	0	2500
Financial Aid	469	143.4	0	499	0	2800	470	160.2	0	582	0	4000
Grants	471	200.3	0	827	0	5500	471	194.9	0	796	0	5500
Loans	471	106.7	0	670	0	5500	471	107.5	0	671	0	5500
Social Security	471	0.4	0	4	0	35	471	0.4	0	4	0	40
Miscellaneous	471	79.9	0	298	0	2000	471	112.8	0	387	0	2626
Tuition	434	382.3	0	973	0	4600	436	384.9	0	976	0	4450
School Books	437	55.1	0	136	0	600	437	53.3	0	120	0	600
Rent	437	422.0	320	491	0	4000	437	418.4	320	485	0	3940
Utilities	436	36.0	20	56	0	360	436	37.0	21	59	0	360
Phone	429	3.0	0	14	0	90	430	3.0	0	14	0	89
Internet	436	29.4	0	44	0	200	435	33.0	0	59	0	350
Groceries	437	154.6	120	172	0	1400	437	161.1	117	197	0	1600
Fast Food	434	42.4	25	54	0	300	434	52.8	31	65	0	350
Car Payment	433	28.4	0	91	0	560	433	31.8	0	105	0	705
Car Insurance	435	30.9	0	63	0	400	435	31.7	0	68	0	460
Gas	436	85.9	60	167	0	1500	436	89.8	60	164	0	1425
Car Repairs	436	12.1	0	36	0	220	436	22.5	0	70	0	450
Air Fare	437	24.4	0	133	0	1000	436	41.5	0	196	0	1400
Medical Insurance	437	29.5	0	114	0	900	437	29.5	0	117	0	900
Medical Co-pay	437	10.0	0	30	0	200	437	15.5	0	52	0	387
Clothing	437	24.2	0	55	0	360	437	35.7	0	91	0	600
Grooming	437	11.1	0	21	0	150	437	12.5	0	27	0	150
Laundry	435	4.9	0	8	0	40	436	4.1	0	7	0	38
Gifts	436	15.6	0	57	0	500	437	17.6	0	60	0	500
Entertainment	435	39.7	30	45	0	300	437	45.9	27	65	0	426
Tithing	437	130.0	60	296	0	2300	437	137.9	63	294	0	2200
Credit Card	434	61.3	0	157	0	884	437	77.4	0	203	0	1235
Debt Payment	437	22.0	0	113	0	845	437	33.3	0	166	0	1249
Life Insurance	437	1.7	0	10	0	78	437	1.8	0	10	0	78
Savings	435	90.2	0	465	0	4137	437	88.9	0	424	0	3500
Vacation	434	9.1	0	41	0	300	434	19.7	0	91	0	663
Other	435	19.9	0	80	0	630	435	27.2	0	93	0	680

Table 2. Projected and Actual Budget Variables

We considered the dispersion variables for both income and expenses, as well as for aggregated income and expenses, all shown in Table 3. The general format we followed for income dispersion variables was the actual (or realized) variable subtracted by the projected variable. A positive dispersion income value indicates that a student has made more money than anticipated, and a negative dispersion value indicates that a student has made less money than anticipated. For the dispersion between expenditure variables, we chose the opposite approach—the dispersion is equal to the projected variable subtracted by the realized variable. This approach was chosen because with expenses, a higher value for the realized variable than for the projected variable means that a student is overspending the

Variable	Ν	Mean	Median	Std Dev	Min	Max
Personal Income	465	829.2	383	2543.5	-202.0	19178.0
Spouse Income	469	-3.0	0	122.4	-1800.0	615.6
Cash	468	-30.1	0	636.8	-11345.0	3300.0
Parent Income	471	36.2	0	190.6	-650.0	2500.0
Financial Aid	469	17.1	0	146.1	-50.0	1800.0
Grants	471	-5.5	0	249.4	-4950.0	2050.0
Loans	471	0.7	0	11.5	0.0	200.0
Social Security	471	0.1	0	0.5	0.0	5.0
Miscellaneous	471	32.9	0	246.1	-1000.0	2626.0
Tuition	434	-4.4	0	135.2	-2250.0	1105.0
School Books	437	1.8	0	58.0	-600.0	350.0
Rent	437	3.7	0	61.5	-544.0	650.0
Utilities	436	-1.0	0	18.2	-160.0	100.0
Phone	429	0.0	0	5.0	-39.0	90.0
Internet	435	-3.6	0	29.0	-285.0	80.0
Groceries	437	-6.6	0	59.9	-349.0	205.1
Fast Food	434	-10.4	-1.15	30.8	-163.4	122.0
Car Payment	431	-3.4	0	37.1	-705.0	30.0
Car Insurance	435	-0.8	0	17.4	-246.8	119.0
Gas	436	-3.9	0	34.5	-291.0	105.2
Car Repairs	436	-10.5	0	54.1	-450.0	130.0
Air Fare	436	-17.0	0	125.2	-1400.0	510.0
Medical Insurance	437	0.0	0	26.5	-298.0	380.0
Medical Co-pay	437	-5.6	0	44.4	-386.6	200.0
Clothing	437	-11.5	0	58.4	-550.0	200.0
Grooming	437	-1.5	0	17.4	-120.0	100.0
Laundry	435	0.7	0	4.1	-37.4	37.0
Gifts	436	-2.0	0	38.4	-500.0	500.0
Entertainment	435	-6.4	0	42.0	-426.0	113.0
Tithing	437	-7.8	0	67.8	-445.0	485.0
Credit Card	434	-16.5	0	93.1	-1235.0	200.0
Debt Payment	437	-11.3	0	83.3	-1249.0	200.0
Life Insurance	437	-0.1	0	1.8	-37.0	0.3
Savings	435	0.9	0	147.9	-1942.4	700.0
Vacation	434	-10.6	0	75.9	-662.8	200.0
Other	434	-7.4	0	61.9	-665.0	623.0
Actual Income	462	3109.9	1558	4582.5	0.0	28600.0
Actual Spending	410	1859.9	1238	2406.1	0.0	19216.0
Projected Income	461	2274.6	1058	3560.1	0.0	26780.0

# Table 3. Dispersion Variables

Variable	Ν	Mean	Median	Std Dev	Min	Max
Projected Spending	401	1691.1	1099	2279.2	0.0	18642.0
Net Actual Income	403	1304.9	202.1	3615.1	-6761.0	24285.3
Net Projected Income	392	574.1	-133	3351.4	-13587.0	16715.0
Spending Dispersion	397	-134.6	-40	365.7	-2790.0	1000.0
Income Dispersion	458	850.3	456.5	2581.1	-10035.0	20369.0

Table 3. Dispersion Variables (continued)

budget. Essentially, we assumed that the relationship between projected and realized values for income is converse to the relationship between projected and actual values for expenses. Also found in Table 3 are two variables that we used as additional controls for our multivariate model: net actual income and net projected income, which are aggregated income subtracted by aggregated expenses for both actual and projected variables, respectively. The net variables serve as a measure of robustness because we could limit the regression to include only observations in which the absolute value of one of these variables was within a certain band. Perhaps students who fit this criterion took the assignment more seriously.

The average dispersion for personal income was \$829.17. This dispersion was larger than any other variable's average dispersion. Most of the variables used had a dispersion somewhere between -30 and 30.

#### **EMPERICAL RESULTS**

We consider results from pairwise Spearman correlations shown in Tables 4 through 7. We chose Spearman as opposed to Pearson due to our extensive use of binary and ordinal explanatory variables. As our dependent variables, we considered seven different variables. Six of these variables were sets of actual and projected variables. The different dependent variables were actual credit card spending, projected credit card spending, actual total income, projected total income, actual total spending, projected total spending, and the dispersion between projected spending and actual spending. This last variable was our main measure to explore a student's aptitude for keeping a budget.

Starting first with realized credit card spending as the dependent variable, we found that being at least 24 years old, being an upperclassman, being usually involved in family financial decisions, having at least two credit cards, and paying at least 50 percent of the student's own college expenses were positively correlated with the dependent variable at the 0.05 level. The only independent variable negatively correlated with actual credit card spending was the variable indicating that at least one of the student's parents is a college graduate.

In the case in which projected credit card spending was the dependent variable, results were largely similar. The variables indicating that the student had

	Age 24+	Female	Intl.	Married	Children
Actual Credit	0.098*	0.002	-0.006	0.037	0.080
	0.040	0.960	0.896	0.440	0.094
	437	437	437	437	437
Projected Credit	0.091	0.012	-0.014	0.048	0.098*
	0.059	0.809	0.764	0.319	0.041
	434	434	434	434	434
Actual Income	0.214*	-0.103*	-0.096*	0.362*	0.177*
	<.0001	0.0262	0.0398	<.0001	0.0001
	462	462	462	462	462
Projected Income	0.165*	-0.061	-0.056	0.362*	0.146*
	0.0004	0.1908	0.228	<.0001	0.0016
	461	461	461	461	461
Actual Spending	0.286*	-0.015	-0.012	0.439*	0.193
	<.0001	0.7574	0.8148	<.0001	<.0001
	410	410	410	410	410
Projected Spending	0.284*	-0.013	-0.002	0.442*	0.188*
	<.0001	0.7902	0.9612	<.0001	0.0002
	401	401	401	401	401
Expend. Dispersion	-0.126*	0.042	0.140*	-0.173*	-0.077
	0.0118	0.4026	0.0053	0.0005	0.1267
	397	397	397	397	397

 Table 4. Univariate Spearman Correlation Coefficients: Demographics

at least one child, was an upperclassman, the student's parents collectively earned less than \$30,000 per year, was usually involved in household financial decisions growing up, had at least two credit cards, and paid for at least 50 percent of college expenses were all positively correlated with the dependent variable at the 0.05 level. Once again, having a parent with a college degree was negatively correlated and also significant. It is interesting to note that no explanatory variables in the financial knowledge group show significant correlations with credit card spending, realized or projected. In Hayhoe et al. [2000], we find no significant correlation between credit card spending and gender.

Next, we considered pairwise correlations between actual total income and the various independent variables. We found that being at least 24 years old, being married, having at least one child, being an upperclassman, reading business news regularly, watching business news on television regularly, having had a job in high school, having a checking account for at least five years, having at least two credit cards, paying for 50 percent of college expenses, and having paid some high school expenses were all positively correlated with realized total income at the 0.05 level. The explanatory variables negatively correlated

	Parent	Allowance	< 30 k	Seldom	Usually	Often
Actual	-0.111*	0.044	0.080	-0.018	0.134*	-0.025
Credit						
	0.0203	0.3627	0.0962	0.7081	0.0051	0.6037
	437	437	437	437	437	437
Projected	-0.127*	0.035	0.105*	-0.028	0.110*	-0.005
Credit						
	0.0082	0.4620	0.0283	0.5556	0.0222	0.9229
	434	434	434	434	434	434
Actual	-0.011	-0.021	0.000	0.041	0.050	-0.033
Income						
	0.8112	0.6578	0.9995	0.3828	0.2805	0.4806
	462	462	462	462	462	462
Projected	0.038	-0.004	-0.004	0.046	0.042	-0.003
Income						
	0.4155	0.9316	0.9253	0.3294	0.3655	0.9417
	461	461	461	461	461	461
Actual	0.032	-0.032	0.078	0.058	0.050	0.021
Spending						
	0.5139	0.5224	0.1133	0.2379	0.3114	0.6644
	410	410	410	410	410	410
Projected	-0.014	-0.011	0.103*	0.057	0.059	-0.001
Spending						
	0.7839	0.8251	0.04	0.2551	0.2413	0.9872
	401	401	401	401	401	401
Expend.	-0.114*	-0.035	0.143*	-0.009	-0.026	0.064
Dispersion						
	0.0230	0.4909	0.0043	0.8574	0.6007	0.2046
	397	397	397	397	397	397

Table 5. Univariate Spearman Corr	elation Coefficients:	Family
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were being female, being an international student, and having paid for all high school expenses.

When projected total income was used as the dependent variable, the pairwise results in which there was a positive correlation were the same as for actual total income, except that viewing news on television, paying at least 50 percent of college expenses, and having paid some high school expenses were no longer significant. Having paid all high school expenses was the only explanatory variable negatively correlated with the dependent variable at the 0.05 significance level.

For expenses, we found that actual total spending is positively correlated with the following explanatory variables at the 0.05 level: being at least 24 years old,

	HS Fin.	HS Acc.	Col. Acc.	Read Bus.	TV Bus.	Business
Actual	-0.004	0.058	-0.055	-0.020	0.039	-0.047
Credit						
	0.9337	0.2249	0.2528	0.6746	0.4157	0.3343
	437	437	437	437	437	431
Projected	0.003	0.067	-0.059	-0.025	0.037	-0.067
Credit						
	0.9477	0.1612	0.2182	0.5975	0.4394	0.1686
	434	434	434	434	434	428
Actual	0.015	0.012	0.039	0.136*	0.098*	0.053
Income						
	0.7400	0.7911	0.4012	0.0035	0.0359	0.2581
	462	462	462	462	462	456
Projected	0.020	0.004	0.046	0.156*	0.078	0.042
Income						
	0.6703	0.9277	0.3232	0.0008	0.0955	0.3766
	461	461	461	461	461	456
Actual	-0.052	-0.004	0.051	0.087	0.040	0.035
Spending						
	0.2898	0.9324	0.3071	0.0771	0.4148	0.489
	410	410	410	410	410	404
Projected	-0.047	-0.003	0.093	0.108*	0.066	0.037
Spending						
	0.3526	0.953	0.0624	0.0305	0.1872	0.4584
	401	401	401	401	401	395
Expend.	0.080	0.062	0.091	-0.019	0.041	-0.008
Dispersion						
	0.1108	0.2158	0.0701	0.7000	0.4133	0.8720
	397	397	397	397	397	391

# Table 6. Univariate Spearman Correlation Coefficients: Financial Knowledge

\*Significant at 0.05 level.

being married, being an upperclassman, having a checking account for at least five years, having invested in the stock market, having at least two credit cards, paying for at least 50 percent of college expenses, and having paid some high school expenses. No explanatory variable held negative significant correlations with actual total spending.

The same significant correlations held between projected total spending and specific explanatory variables but with the addition of three more variables that were positively correlated with the dependent variable: having at least one child, having parents who collectively earn less than \$30,000 per year, and reading

	HS Job	Acct. 5+ Yr.	Stock Mkt.	2+ Credit	Col. Paid 50%	HS Some	HS Full
Actual Credit	0.014	0.083	0.044	0.179*	0.105*	0.067	-0.034
	0.7631	0.0824	0.3606	0.0002	0.0281	0.1593	0.4835
	437	437	437	437	437	437	437
Projected Credit	0.035	0.086	0.042	0.188*	0.104*	0.086	-0.059
	0.4658	0.0719	0.3797	<.0001	0.0297	0.0719	0.2200
	434	434	434	434	434	434	434
Actual Income	0.165*	0.187*	0.084	0.249*	0.130*	0.095*	-0.154*
	0.0004	<.0001	0.0714	<.0001	0.0052	0.0412	0.0009
	462	462	462	462	462	462	462
Projected Income	0.100*	0.168*	0.078	0.216*	0.060	0.065	-0.096*
	0.031	0.0003	0.0943	<.0001	0.1977	0.1626	0.0384
	461	461	461	461	461	461	461
Actual Spending	0.074	0.267*	0.121*	0.282*	0.133*	0.123*	-0.090
	0.1365	<.0001	0.0143	<.0001	0.007	0.0126	0.0675
	410	410	410	410	410	410	410
Projected Spending	0.083	0.256*	0.126*	0.291*	0.135*	0.129*	-0.061
	0.0969	<.0001	0.0115	<.0001	0.0068	0.0099	0.2245
	401	401	401	401	401	401	401
Expend. Dispersion	-0.047	-0.161*	-0.014	-0.057	0.001	0.009	0.140*
	0.3521	0.0013	0.7786	0.2541	0.9887	0.8635	0.0053
	397	397	397	397	397	397	397

Table 7. Univariate Spearman Correlation Coefficients: Life Experience

business news regularly. Like its actual counterpart, there were no explanatory variables negatively correlated with projected total spending at the 0.05 significance level.

Finally, we consider all significant pairwise correlations between explanatory variables and our principle dependent variable of interest, which was expenditure dispersion. If an independent variable was positively correlated with expenditure dispersion, it indicated that the variable was correlated with students' not effectively adhering to their budgets. Likewise, negatively correlated variables were associated with students' adhering to their budgets. We found that being an international student, having parents that earned less than \$30,000 per year, and having paid for all high school expenses were positively correlated with expenditure dispersion at the 0.05 level. These relationships seem intuitive, as each variable was associated with people needing to adopt more austere financial practices to get by, especially while attending college. On the other hand, being

Variable	Parameter	Std Err	t-value	p-value	VIF
Intercept	-24.9	92.8	-0.27	0.7888	0
Female	-17.5	44.9	-0.39	0.6971	1.22
HS Finance	59.9	67.3	0.89	0.3739	1.17
HS Accounting	37.2	54.1	0.69	0.4926	1.16
Col. Accounting	83.0	69.1	1.2	0.2306	1.11
Read Business	-0.3	43.9	-0.01	0.9949	1.21
TV Business	-9.1	73.0	-0.13	0.9004	1.16
Parent	-116.1*	53.0	-2.19	0.0292	1.19
Allowance	2.7	38.1	0.07	0.9444	1.12
HS Job	29.2	43.7	0.67	0.5045	1.40
Stock Market	-1.0	41.9	-0.02	0.9814	1.07
International	25.7	74.7	0.34	0.7313	1.68
24+ Years Old	-87.8	48.9	-1.79	0.0735	1.59
Upperclassman	-79.9	53.7	-1.49	0.1376	1.19
Acct. 5+ Years	-61.7	43.7	-1.41	0.1591	1.47
2+ Credit Cards	-0.9	42.5	-0.02	0.9833	1.27
Col. Paid 50+%	54.3	43.5	1.25	0.2133	1.19
Married	-52.2	46.6	-1.12	0.2636	1.50
1+ Children	-130.3	79.8	-1.63	0.1034	1.22
Parents $< 30k$	150.5*	72.0	2.09	0.0372	1.20
Seldom Involved	-8.1	42.6	-0.19	0.8489	1.39
Usually Involved	-80.3	56.6	-1.42	0.1570	1.34
Often Involved	10.5	84.8	0.12	0.9016	1.18
HS Paid Some	20.8	65.9	0.32	0.7524	1.15
HS Paid 100%	7.7	55.5	0.14	0.8905	1.68

#### Table 8. General Regression for Spending Dispersion

\*Significant at 0.05 level.

at least 24 years old, being married, having a parent with a college degree, and having a checking account for at least five years were significantly correlated with expenditure dispersion and had a negative sign on their respective coefficients. Several of these variables are suggestive of students having reliable support or experience, and as a result they may not have felt as compelled to adhere to a budget.

Next, we extend our analysis to a multivariate approach using OLS. We used each independent variable from all four previously established categories in our regression equation and consider expenditure dispersion as the dependent variable.

First, we consider a general regression using spending dispersion as the independent variable. These results are found in Table 8. We found that having at least one parent with a college degree and having parents that aggregately earn

Variable	Parameter	Std Err	t-value	p-value	VIF
Intercept	-23.2	78.8	-0.29	0.7683	0
Female	-26.8	40.8	-0.66	0.512	1.23
HS Finance	64.7	58.9	1.10	0.2732	1.17
HS Accounting	-12.1	48.3	-0.25	0.8026	1.21
Col. Accounting	51.9	66.4	0.78	0.4351	1.20
Read Business	-16.5	42.5	-0.39	0.6972	1.21
TV Business	117.4	74.0	1.59	0.1138	1.12
Parent	-67.2	49.4	-1.36	0.1752	1.27
Allowance	9.6	34.9	0.27	0.7843	1.14
HS Job	-58.8	40.0	-1.47	0.1432	1.45
Stock Market	-16.9	37.9	-0.45	0.6558	1.09
International	35.3	67.0	0.53	0.5988	1.57
24+ Years Old	-47.7	47.7	-1.00	0.3188	1.66
Upperclassman	-61.4	48.4	-1.27	0.2059	1.29
Acct. 5+ Years	-10.0	40.3	-0.25	0.8036	1.53
2+ Credit Cards	26.3	41.8	0.63	0.5297	1.38
Col. Paid 50+%	110.5*	39.9	2.77	0.0060	1.29
Married	-89.9*	44.6	-2.01	0.0452	1.50
1+ Children	48.9	85.4	0.57	0.5674	1.19
Parents $< 30k$	102.0	68.7	1.48	0.1393	1.23
Seldom Involved	-38.5	39.1	-0.98	0.3260	1.43
Usually Involved	-24.3	55.6	-0.44	0.6623	1.37
Often Involved	23.4	81.7	0.29	0.7751	1.19
HS Paid Some	149.4*	74.2	2.01	0.0452	1.13
HS Paid 100%	-32.6	47.4	-0.69	0.4927	1.60

Table 9. Regression Controlled for Net Actual Income

less \$30,000 per year were the only variables that were statistically significant. These two variables were arguably opposites of each other; consequently, we would expect the coefficients to have different signs. No variable had a variance inflation factor (VIF) of greater than 1.7, indicating no significant multicollinearity between the independent variables.

We then estimated the regression specification found in Table 8, except we winsorized all budget variables at the 90 percent level. We found that the same two variables were significant at the 0.05 level, but the marginal effects were lower in magnitude, with the parent college degree variable having a coefficient of -103.76 and the \$30,000 variable with a coefficient of 87.64. Additionally, being an upperclassman was significant, with a parameter estimate of -64.92.

We next introduced an additional control to the same regression framework, where we restricted the observations to ones where the absolute value of either the

Variable	Parameter	Std Err	t-value	p-value	VIF
Intercept	-45.1	108.2	-0.42	0.6774	0
Female	42.3	55.3	0.77	0.4450	1.25
HS Finance	68.2	80.5	0.85	0.3980	1.16
HS Accounting	4.0	65.4	0.06	0.9509	1.22
Col. Accounting	51.4	89.3	0.58	0.5653	1.20
Read Business	27.8	58.6	0.47	0.6356	1.25
TV Business	115.9	100.2	1.16	0.2484	1.21
Parent	-117.0	68.6	-1.71	0.0893	1.24
Allowance	15.7	47.1	0.33	0.7400	1.14
HS Job	21.1	54.0	0.39	0.6963	1.44
Stock Market	-29.0	51.4	-0.56	0.5728	1.08
International	-109.5	94.8	-1.15	0.2496	1.61
24+ Years Old	-35.0	64.2	-0.55	0.5859	1.54
Upperclassman	-99.6	67.2	-1.48	0.1398	1.34
Acct. 5+ Years	-28.1	53.9	-0.52	0.6019	1.49
2+ Credit Cards	-80.5	57.6	-1.40	0.1641	1.34
Col. Paid 50+%	125.2*	52.9	2.37	0.0189	1.26
Married	-82.0	60.1	-1.36	0.1740	1.41
1+ Children	14.7	129.9	0.11	0.9098	1.25
Parents $< 30k$	146.0	96.9	1.51	0.1334	1.27
Seldom Involved	-5.2	52.8	-0.10	0.9218	1.41
Usually Involved	-69.3	72.3	-0.96	0.3387	1.31
Often Involved	-42.2	105.4	-0.40	0.6892	1.17
HS Paid Some	4.1	99.5	0.04	0.9669	1.12
HS Paid 100%	-15.1	63.4	-0.24	0.8124	1.57

Table 10. Regression for Net Projected Income

net actual income (NAI) or net projected income (NPI) was below a certain value. Restricting the observations to a reasonable band could eliminate observations where the assignment was not taken seriously.

In the first of such controls we considered, we eliminated all observations in which the net actual income was outside of the interval between -\$1,000 and \$1,000. The results for this regression are found in Table 9. We found that paying for at least half of college expenses was significant, with a coefficient of 110.52; being married is significant, with a coefficient of -\$9.88; and having paid some high school expenses was significant, with a coefficient of 149.40.

Now consider the first case with the separate control variable, net projected income. The results of this regression are found in Table 10. Similar to the previous regression, observations were restricted to those in which net projected income is between -\$1,000 and \$1,000. We found in this specification that the

Variable	Parameter	Std Err	t-value	p-value	VIF
Intercept	9.9	87.7	0.11	0.9100	0.00
Female	20.3	49.3	0.41	0.6809	1.19
HS Finance	81.6	81.2	1.01	0.3164	1.17
HS Accounting	-100.6	60.9	-1.65	0.1005	1.34
Col. Accounting	-3.3	89.0	-0.04	0.9708	1.41
Read Business	15.6	50.4	0.31	0.7566	1.20
TV Business	133.9	92.1	1.45	0.1480	1.15
Parent	-53.9	63.7	-0.85	0.3984	1.56
Allowance	-11.5	42.2	-0.27	0.7865	1.20
HS Job	-61.4	47.7	-1.29	0.1995	1.49
Stock Market	-61.1	45.3	-1.35	0.1791	1.16
International	15.5	76.4	0.2	0.8396	1.57
24+ Years Old	-76.0	57.1	-1.33	0.1849	1.65
Upperclassman	-1.3	55.2	-0.02	0.9806	1.35
Acct. 5+ Years	-27.0	50.7	-0.53	0.5948	1.75
2+ Credit Cards	123.7*	53.5	2.31	0.0221	1.47
Col. Paid 50+%	93.4*	45.9	2.03	0.0439	1.32
Married	-136.6*	57.3	-2.38	0.0184	1.63
1+ Children	137.9	116.2	1.19	0.2374	1.25
Parents $< 30k$	115.4	81.5	1.42	0.1588	1.27
Seldom Involved	-29.4	47.2	-0.62	0.5348	1.52
Usually Involved	15.8	67.5	0.23	0.8158	1.39
Often Involved	-51.4	96.0	-0.54	0.5930	1.25
HS Paid Some	233.5*	100.3	2.33	0.0213	1.22
HS Paid 100%	-79.4	57.4	-1.38	0.1689	1.72

Table 11. Regression for Net Actual Income

students' paying for at least half of their own college expenses was the only significant variable, with a marginal effect of 125.25. In other words, students who paid for at least half of their college expenses on average saw an increase of \$125.25 to their spending dispersion.

We next considered identical regressions to those discussed in the previous two paragraphs, but each with the budget variables winsorized to 90 percent instead of 98 percent. In the 90 percent case, using net actual income, we found that having a college-graduate parent and having parents who earned less than \$30,000 were once again significant at the 0.05 level. The marginal effects were, respectively, -76.52 and 103.50. In the 90 percent case using net projected income, we found two new variables to be statistically significant: having taken finance in high school and having a checking account for at least five years. The coefficients on these variables were 76.57 and -54.52. This

Variable	Parameter	Std Err	t-value	p-value	VIF
Intercept	20.5	131.2	0.16	0.8759	0
Female	56.1	80.1	0.70	0.4849	1.28
HS Finance	-4.5	146.4	-0.03	0.9755	1.19
HS Accounting	-5.4	109.9	-0.05	0.9610	1.39
Col. Accounting	18.7	120.1	0.16	0.8763	1.34
Read Business	74.4	87.0	0.86	0.3942	1.31
TV Business	-117.4	180.3	-0.65	0.5162	1.38
Parent	-109.4	106.8	-1.02	0.3079	1.38
Allowance	6.9	72.5	0.10	0.9244	1.33
HS Job	-52.3	80.4	-0.65	0.5168	1.62
Stock Market	-60.1	76.2	-0.79	0.4319	1.16
International	-137.1	133.5	-1.03	0.3067	1.76
24+ Years Old	-164.7	91.7	-1.80	0.0751	1.56
Upperclassman	-45.1	95.8	-0.47	0.6388	1.63
Acct. 5+ Years	-35.7	78.6	-0.45	0.6508	1.57
2+ Credit Cards	-45.1	85.3	-0.53	0.5985	1.32
Col. Paid 50+%	207.8*	76.9	2.70	0.0079	1.45
Married	-197.7*	91.3	-2.17	0.0325	1.48
1+ Children	311.2	287.9	1.08	0.2821	1.20
Parents $< 30k$	261.8	147.1	1.78	0.0778	1.34
Seldom Involved	-32.9	81.1	-0.41	0.6856	1.65
Usually Involved	-143.5	118.7	-1.21	0.2292	1.39
Often Involved	3.4	137.9	0.02	0.9802	1.30
HS Paid Some	145.6	157.1	0.93	0.3561	1.21
HS Paid 100%	-78.9	94.0	-0.84	0.4034	1.70

Table 12. Regression for Net Projected Income

finding indicates that a high school finance class may be associated with more effective budgeting.

To conclude our empirical results, we consider four last regressions according to the same style as those found in Tables 9 and 10. In the regressions in Tables 11 and 12, any observations in which the absolute value of net actual income was greater than \$500 were deleted. We estimated these regressions both with the 98 percent winsorization and the 90 percent winsorization. Tables 11 and 12 report the results of a 98 percent winsorization. (All robustness test tables are available from the authors on request.)

Let us first jointly examine Tables 11 and 12. In Table 12, we see three statistically significant variables: having at least two credit cards, paying for at least half of their own college expenses, and being married. The coefficients were 123.70, 93.39, and -136.58, respectively. We see the college expenses and

marriage variables as part of a common theme throughout this study. In the net projected income case (Table 12), we found similar results, with paying for at least 50 percent of college and being married both statistically significant. The marginal effects here were 207.83 and -197.74.

#### CONCLUSION

This research studied student budgets, comparing projected income and spending with realized income and spending. We document several factors that were involved in how students anticipate and carry out financial decisions. The factors that we found to be statistically significant in a multivariate framework were the variables for having a college-graduate parent, parents earning less than \$30,000 per year, being married, paying for at least half of their own college expenses, having paid some high school expenses, having taken a high school finance class, having a checking account for at least five years, and having at least two credit cards. Having parents who earn less than \$30,000 per year and paying for at least half of college expenses consistently had positive coefficients in both pairwise and multivariate models. The parent-income variable and being married consistently showed negative coefficients and were often statistically significant.

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# Problem-Based Learning: Executive-Led Cases In Finance Seminars

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This paper highlights a decade of experience using executive-led, problem-based cases in upper-level finance seminars that were designed to help students wrestle with the complexities of real-world business decisions. Content-based courses can confine sense-making, leaving inexperienced undergraduate students often unprepared for resolving highly unstructured problems with complex dilemmas. Problem-based learning (PBL) encourages integration of past and current learning, connects theory and practice, and breaks down cumbersome functional silos. PBL helps students cope with ambiguity, improve their critical thinking ability, and cultivate communication skills. A brief background to PBL is presented, followed by information on course design, example seminars, guidelines, and lessons learned.

Keywords: Problem-based Learning (PBL), Integrated Learning, Selfdirected LearningDisciplines of Interest: Finance, All Business Disciplines

#### INTRODUCTION

For decades there has been discussion about the need to change business education to better prepare students for careers in contemporary organizations. Business programs have been criticized for lacking relevance and stressing quantitative over behavioral learning [Mintzberg, 2004; Porter and McKibbin, 1988], being unrealistic and based on academic research lacking connection to business practice [Bennis and O'Toole, 2005; Pfeffer and Fong, 2002], and not interrelating the various functional aspects of complex business issues [Latham, Latham, and Whyte, 2004]. Yet, there has been only "incremental movement" since Porter and McKibbin [Ungaretti, Thompson, Miller, and Peterson, 2015]. Latham, Latham, and Whyte [2004] contend that business education needs a

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"third wave of change" to develop the skill of "integrative thinking" to overcome functionalism, which they describe as the key shortcoming of business schools.

Latham, Latham, and Whyte [2004] suggest that often "finance professors, for example, have little or no knowledge of what is taught by the professors in organizational behavior. And neither group knows nor cares what is being taught . . . in any other discipline within the business school" [p. 7]. Faculty often have limited business, government, or consulting experience that could help them appreciate the need to draw from more than one business function to solve unstructured and entangled organizational problems.

Students soon develop a silo mentality that is reinforced by discipline-based textbooks, lectures, and traditional examinations. They learn what is needed for each course and "fail to grasp the interrelationships among the knowledge, skills, and abilities they are acquiring in one discipline and those that they are acquiring in another" [Latham, Latham, and Whyte 2004, p. 7]. Faculty, too, are comfortable with the traditional pedagogy of lectures and textbook exams. Both teachers and students need to be motivated to change, if they are to catch up with contemporary organizations that emphasize teamwork and cross-functionalism to cope in a dynamic environment.

Engagement is one of the three key themes by which the Association to Advance Collegiate Schools of Business (AACSB) International (the accrediting body) seeks to "challenge business educators to pursue excellence and continuous improvement in their business programs" [AACSB, n.d.]. The integration of academic learning and practice application is a key aspect of the engagement theme. Problem-based learning (PBL) is one way to pursue the AACSB engagement theme.

Both hard and soft skills are factors in professional success and desired by employers [Ibrahim, Boerhannoeddin, and Kayode, 2017). There are "what, why, when, how, and who" developmental aspects that muddy sources, timing, and processes of development [Martin, 2019]. Business education plays a needed role in helping students build competencies in areas such as critical thinking, communication, interpersonal relationships, and the ability to deal with change and ambiguity [Klimoski and Amos, 2012]. Distinctions between "hard" critical thinking, analytical, and technology skills and "soft" leadership, communication, interpersonal, and team-building skills are meaningless for those who want to succeed in today's uncertain environment [Hamel, 2000]. In other words, we need both hard and soft skills. Organizations of the 21<sup>st</sup> century need employees with the capacity for learning. Longmore, Grant, and Golnaraghi [2018] describe the pressure that business educators are under to develop a variety of transformative learning competencies in students to lead the organizations of tomorrow.

The challenge is how to best achieve these ends. PBL is especially helpful when trying to inspire students to think critically and develop abilities for decades of self-education in their future careers [see Spence, 2004; Longmore, Grant, and

Golnaraghi, 2018; Taipalus, Seppänen, and Pirhonen, 2018; Ungaretti et al., 2015].

#### WHY PBL

Many young business professionals, a few years out of college, consistently tell us that they learned significantly more in their first year after graduation than during their entire business school program. This view appears to be common among graduates from large and small, public and private, and highly regarded and lesser-known programs. Many say that their university experiences ill prepared them for a work environment that is far more confounding and demanding than they had ever imagined. Some business professionals are angered by the lack of relevance of the formal business curriculum they completed. As one said, "We didn't get enough rug time" (i.e. experience in presenting and defending recommendations). Another said, "I was so intimidated by ambiguity for the first few years that I didn't know what to do."

The consensus is that their business education did not prepare them for complex problem solving. They did not learn how to sort relevancy from insignificance and ask appropriate questions *first*—instead, they were taught to provide pre-learned answers to solve assumed problems. Even upper-level business seminars often still operate in the textbook mode, with answers following precise questions, rather than using the problem-solving mode in which one first has to determine the underlying questions before researching options and deciding on a solution. Cases, such as Harvard cases, are often used in upper-division courses and are a step forward in problem-solving opportunities. However, even though cases have levels of ambiguity and provide opportunities to apply theory, they are usually framed within a particular scope and with particular data provided. In addition, how cases are actually used in the classroom changes from faculty to faculty.

Companies understand this failing of business education, and the larger firms partly overcome it by sponsoring their own formal internship programs to engage students in practice while they are learning theory in the classroom. Some colleges also see this disconnect and have added a required internship or other "business laboratories" [e.g. Blaylock and McDaniel, 2006]. Increasingly, some educators are creating projects framed with uncertainty. For example, Taipalus, Seppänen, and Pirhonen [2018] have sought to simulate the uncertainty of the software world of practice in the classroom through PBL.

PBL by its very nature, however, encourages integrated versus fragmented learning and helps to bridge theory and practice [Sherwood, 2004]. Although not yet widely used in business education, PBL seems to be found more often in courses that are inherently integrative, e.g. management [Coombs and Elden, 2004], with a special issue of the *Journal of Management Education* [October 2004] devoted to the use of PBL in management education. Less has been

reported on ways to use PBL in more quantitative business disciplines such as finance, though there are reports of PBL being used in accounting education [e.g. Heagy and Lehmann, 2005; Milne and McConnell, 2001; Stanley and Marsden, 2012]. Yet, finance courses built around "live" business problems can help students turn integrated learning into application; be motivated to build core competencies; and learn to operate in complex, unstructured situations.

The following discussion summarizes our efforts to address the artificial nature of a strict reliance on content-based classroom learning. We provide examples from more than a decade of experience using PBL in upper-level undergraduate finance seminars. A brief background to PBL is first presented, followed by information on course design, sample case seminars, guidelines, and lessons learned.

#### **BRIDGING THE GAP: PBL**

"PBL is an instructional strategy that uses a problem as a starting point for learning. The problem is one that students are apt to face as future professionals. The knowledge students are expected to gain . . . is organized around problems rather than the disciplines. Students work in project teams on these problems and assume a major responsibility for their own instruction and learning" [Bridges, 1992, p. 17].

Background of PBL

According to Barrows [1996], there are several defining characteristics of PBL. Student-centered learning occurs in small groups, with the instructor serving as a facilitator/guide rather than in the traditional role of a professor. Ambiguous problems are the focus for self-directed learning along with development of problem-solving skills.

PBL is an active, experiential, and learner-focused instructional technique that has been extensively used in the professions, especially in medicine where the method was developed [Coombs and Elden, 2004]. Rhem [1998] and others [e.g. Neville, 2009] suggest several reasons why PBL has gained in popularity in professional fields. First, an explosion of information has made traditional professional education difficult to deliver because it is impossible to cover everything needed. Students must be able to self-educate throughout their careers. Second, the world today depends on collaboration and teamwork in problem-solving, which are stressed in the PBL approach. Finally, in PBL courses students learn in complex and ambiguous situations, much like the real-world environment, resulting in higher levels of comprehension, with students better able to adapt their learning to new situations. Life and learning take place in "contexts" that affect the range of possible solutions. With PBL, students are more oriented to meaningmaking over fact-collecting [Rhem, 1998]. This ability can be extremely helpful to students in making sound decisions when circuitous dilemmas arise later in their professional careers.

In our experience, the PBL method has not been as extensively used in business education. Bouhuijs [2011] identifies three primary barriers to PBL: teachers, programs, and the organization. At any or all of these levels, there are likely the needs to adapt cultures, make organization changes, and develop faculty to achieve sustained PBL [see also Hallinger and Lu, 2011]. Despite the challenges, PBL has been used in some business school programs [see Brownell and Jameson, 2004; Calk and Carr, 2011; Da Silva, de Araújo Bispo, Goncalves Rodriguez, and Felipe Vasquez, 2018; Gijselaers, Tempelaar, Keizer, Blommaert, Bernard, and Kasper, 1995; Gilbert and Foster, 1997; Ho and Brotherton, 2018; Kadir, Abdullah, Anthony, Mohd Salleh, and Kamarulzaman, 2016; Serda and Alsina, 2018; Ungaretti, Thompson, Miller, and Peterson, 2015]. The interest in and use of PBL may be attributed to the fact that it does bridge several gaps in business education today between factors such as theory and practice, classroom and organization, knowledge and competencies, and teaching and learning. It encourages assimilation across business functional areas while focusing on an ill-defined problem such as might be found in real-world organizations. There is also evidence that PBL more deeply engages students than lecture-based classes do [Dean and Jolly, 2012]. However, there is likely a trade-off between mastery of content and learning to apply practical skills [Carriger, 2015; Neville, 2009; Ungaretti et al., 2015].

Engaging in PBL involves a significant time commitment from the faculty member. As Ungaretti et al. describe, PBL requires faculty preparation. Faculty become learners themselves by creating their own toolbox of "critical thinking skills, logical analytical frame-works, content resources, and group-processing techniques suited for discovering answers" [2015, p. 179]. Other "set-up costs" include developing and maintaining industry connections. As faculty are unable or unwilling to learn new skills, make connections to industry, or invest the time and energy, PBL is much less likely to occur. Case-based learning is a step forward from lecture/discussion learning and on the way to PBL.

#### Continuum of PBL Options for Business Courses

There have been many definitions of PBL, depending on its use, the professional area, and student level [Savery, 2006; Da Silva et al., 2018]. Despite the varying definitions, Sherwood [2004] found convergence in the definitions in that the problem is the center of the learning process and the problem context is a critical factor in the process. Sherwood and others [e.g. Barrows, 1986; Harden and Davis, 1998] have described varying ways to implement PBL that form a continuum from "light" involvement with the problem (e.g. a written case) to "rich" involvement (i.e. real-time problems, interaction with the actual decision makers, and a live consulting role).

The "light" end of the continuum may not give students the true advantages of PBL. Some cases that are limited in scope are likely on the "light" end of the continuum. Robust cases are further along the continuum. Indeed, there are a variety of ways and levels to engage in learning through the case study method (see Barnes, Christensen, and Hansen, 1994; Anderson and Schiano, 2014]. Kohlert, Brulotte, Bell, Roy, and Jalali, [2018] have developed a helpful criteria tool evaluating case-based learning. It could be adapted to PBL and management education. PBL is open-ended and more likely to be at the "rich" end of the continuum. This richness, at times, may be too intense and advanced for undergraduate students without sufficient structure and support. Faculty, as well, may be uncomfortable with the logistical and project management issues involved at the rich end when using live student teams for real-time consulting in organizations. To help undergraduates prepare for the world of practice, we propose a PBL format with student roles moving toward the "rich" end of the continuum but still structured and supported.

#### EXECUTIVE-LED PBL CASE SEMINARS

To make our own courses more meaningful and real for undergraduate students, we sought a new way to connect the ambiguous business world with the artificial and structured classroom. An executive-led, real-world, live case seminar for upper-level students was our solution. In order to have sufficient subject knowledge and analytical tools, it is important to be thoughtful about course prerequisites. The ambiguity of PBL may create situations where students are wrestling with problems that they are ill-prepared to solve. Schmidt, Rotgans, and Yew [2011] summarized multiple studies and found that "[T]here is considerable support for the idea that PBL works because it encourages the activation of prior knowledge in the small-group setting and provides opportunities for elaboration on that knowledge" [p. 792]. This is why it is important that course prerequisites provide a solid foundation in subject knowledge and analytical tools. Even with this preparation, the faculty member is guiding and reminding of discipline related concepts and tools.

Following PBL case guidelines from others such as Stinson and Milter [1996], we wanted to use authentic and contemporary real-time cases with problems that are ill-defined and mirror professional practice. Students would be required to work in teams and use discipline and cross-disciplinary knowledge, as well as develop broader core competencies required in business, such as critical thinking and professional-level communication. The differences between this approach and the more commonly used case method, such as Harvard cases, are found in the opening framing and opportunities for student-led pursuit of answers and applications. There is no "edge" to the learning.

To develop a seminar akin to an internship but in a classroom setting, we decided to use executives as co-instructors for either recent or live cases based on

issues they encountered in their businesses. Senior executives, familiar with the politics and personalities involved in a case, present corporate briefings to the students, who then proceed to define issues, solve the case, and make their recommendation as to the course of action that the organization should pursue. Final student team presentations are made in corporate boardrooms for added realism.

General criteria for the selection of executives include general interest to engage with students, framing of an interesting and engaging problem for analysis, and availability to be in the classroom and have students visit their work sites. The executive as exemplar is a factor to consider, and so care must be taken in the general vetting for ethics. Geographic accessibility is important for students and faculty. There are opportunities to collaborate with alumni development offices on campus to build stronger relationships with select alumni. Faculty also share with executives the general university standards for engaging with students. These are likely very similar to professional standards of conduct. We did not find any particular issues with selecting and incorporating executives as co-instructors.

#### Seminar Goals

The main goal of this executive-led case format was to bring realism to the classroom by using authentic business situations. A secondary, but equally important, goal was to help students develop the enduring foundational competencies required throughout their careers: active listening, rapid targeting of key issues, question formation, simplifying complexity, development of higher level questions, and solution focus.

#### Seminar Structure

The PBL case seminars were carefully designed to make the learning environment more similar to a business setting than to a lecture setting. It was made clear that there was not a single "right answer" to any of the cases, but rather a range of acceptable conclusions and policy suggestions. Additional realism came from holding some classes and all project presentations in corporate boardrooms with students dressed in business attire. Particular seminars added greater authenticity when students had to sign an information non-disclosure form or get badges to enter secured areas in a company. Site field trips and meeting recent grads also helped to engage students in the case.

Each senior research seminar was small, from 15 to 20 students, and project work (analysis, research, report writing, presentations, etc.) was performed in teams of two to four students. Most students were finance or economics majors, and approximately half were second-semester seniors. Before students were admitted to the course, they were interviewed by the professor and carefully screened for prerequisite courses and abilities. Course prerequisites included statistics, math, financial accounting, managerial accounting, principles of finance, financial investments, and an additional upper-division finance elective.

The executives were responsible for preparing materials regarding their particular case or cases to present to students—sometimes at the company and other times in the classroom. The professor developed the syllabus in coordination with the participating executive, revolving around the two to three cases to be used. The professor was also responsible for forming student teams, facilitating teams, leading class discussion, and grading—although executives provided feedback and suggestions to students on their presentations and written reports.

#### Getting Started: Locating an Executive and a Real Case

We have found companies and executives to be very responsive when contacted about helping with a seminar. In fact, executives were actually excited to be involved, wishing they had had a similar experience when they were students.

Finding a participating executive may seem intimidating. However, connecting with a business school advisory board member usually provides either a ready "yes" or a recommendation of someone who would be interested in such a proposition. Deans are also valuable in linking professors with local executives, as are campus centers with connections to alumni and the community. State or regional business groups are another source of executives. It is surprisingly easy to get started, and the executive usually has specific recent case options in mind. It is important, though, to select a broad, interdisciplinary problem that is ill-structured and requires collaboration of students to solve. Such a case will then match with PBL learning objectives.

We have found both businesses and executives to be quite interested in being involved with higher education. Importantly, companies want our "product," that is, competent business graduates. In addition, executives are often at a life stage when they have a deep desire to give back by mentoring students. It is giving back and being involved in educating students that are of interest.

The participating executives had no pretext of seeking free labor or something for nothing—the executives understood that these were student proposals. Indeed, students soon recognized that their case solutions were sometimes "off target" in that student frames of analysis were not what executives would have focused on themselves. Each seminar, however, would usually result in an internship or employment offer to one or two students—although students were unaware of this possibility during the semester to prevent hyper-competition among students.

#### PBL CASE SEMINAR EXAMPLES<sup>1</sup>

Short descriptions of several seminars provide examples of the wide range of problems that can be used and the unique learning that can occur. These seminar

<sup>&</sup>lt;sup>1</sup> For guidelines on PBL course design and implementation, see Duch et al., 2001; Gijselaers et al., 1995; Peterson, 2004; Sherwood, 2004; Stinson and Milter, 1996; Ungaretti et al., 2015.

topics were selected in a combination of factors, including a willing and suitable executive instructor, geographic proximity, and an appropriate research opportunity. Other seminar topics not described below included market assessment and cash flow modeling for a large real estate developer, and, for an MBA finance seminar co-instructed with a Seattle investment firm, a project comparing returns from "green investments" to those in the Russell 2000 market index.

Seminar Topic #1: Small Venture Capital Firm-Real-Time Projects

The first PBL finance seminar was coordinated with a highly successful firm specializing in financing rapid-growth companies. The president/founder of the firm cooperated in the design of the class and actively involved students in actual business situations. Five cases or projects (three involving rather specific hedging and option strategies) were assigned during the semester. For each case, the executive first presented background material in a class session on campus; next, students researched the project for about two weeks; and teams made final presentations at company offices the third week. During the two weeks of research, students could and did discuss project details with the executive—by phone, email, or in person at his office.

In this seminar, the projects were not known in advance because assignments were made as the result of real-time business projects. This seminar also stressed the human behavior side of investment management, including ethical behavior considerations. This process occurred in the dialogue among faculty, executives, and students preparing for and after presentations and in the concluding afteraction reviews (AAR) discussed later.

Seminar Topic #2: Large Aerospace Company Merger

The second seminar, which was repeated in three semesters, involved a merger-acquisition in the aerospace industry. This seminar was co-taught with two senior executives who had been intimately involved in the merger. Students came to appreciate much more than the balance sheet approach to mergers because they had to integrate organizational behavior concepts, human resource management practices, and agency theory issues in large corporations into the more straightforward financial considerations.

The format of this seminar was for the executives to come to campus to make their initial presentations and provide background handouts one week, then return to class the following week to answer additional student questions and help the students better define the project parameters. Three weeks later, the student teams delivered their project reports and made their presentations at the company's headquarters. In this seminar, the students were not allowed to contact the executives during the interim period. Seminar Topic #3: Environmental Risk Analysis

The next seminar focused on environmental impacts associated with financial decisions made by a mining company. Again, this seminar involved a real-life case that was co-taught with environmental and public relations lecturers and stressed the human aspects of corporate behavior. The primary co-instructor was the editor of a large newspaper in the state who had a personal interest in environmental sustainability. Several other technical and scientific co-instructors were also involved.

This project, although of great interest to students, was more technical and involved at least a general understanding of science and engineering. In addition, even though we would not generally recommend such an example because of its high level of complexity, several rich learning experiences emerged. Three final presentations were made to an environmental interest group, to an industry group, and to the newspaper's editorial board. Reactions varied widely. Industry reviewers regarded students' recommendations as being anti-business, whereas the environmental representatives and the editorial board saw student proposals as being anti-environment. This seminar was a key learning experience for students, who thought they were being objective in their analysis and recommendations.

Seminar Topic #4: Plant Expansion at a Forestry Products Firm

The next seminar was co-taught with a senior executive from a large forestry products firm and focused on a proposed multimillion-dollar plant expansion. Interestingly, the company's actual decision had little to do with finance and was almost entirely based on understanding human behavior, an aspect of reality that is not commonly found in the study of conventional financial analysis. One of the more unique elements of the case design was that the executive, at his own suggestion, would answer student questions only via e-mail from the perspective of an individual located on a company organizational chart. Students quickly realized that each individual on the organizational chart has a different view of what is optimal.

As in the previous examples, the final student presentations were given in the company's boardroom, with an array of high-level executives present. The teams did not realize that their proposals did not match the company's actual decision until after their presentations were over because they were treated so well by the executives. It is interesting that in the course debriefing, some students said that they wished they had received harsher and, in their view, more realistic treatment in their final presentations.

Seminar Topic #5: Large International Investment Firm-Risk and Return

This seminar was co-taught with the research and investment policy director at a large, international investment firm, who was a former finance professorunlike the previous executives who had not had such in-depth teaching experience. In this example, the executive made four presentations on campus. This project on risk and return, spanning an entire semester, involved two separate student presentations to executives at corporate headquarters.

Students will commonly use accepted theories such as risk and return to resolve real-world questions, as opposed to using theory as a framework of explanation. Students also assume that rational behavior prevails—a view embedded in conventional theory—without considering the non-rational behavioral aspects of real-world problems.

In the seminar students empirically explored the relationship between risk and return. In the field of finance and in business in general, students are led to believe that there is a strong link between risk and return. For this project, however, the students were required to give evidence for such a link. After an exhaustive empirical and literature review produced scant evidence, students began to focus on the behavioral or psychological aspects of market behavior (e.g. how psychology impacts risk-taking behavior such that investors take on risk when they perceive risk to be low and vice versa). This greatly expanded students' approach to analyzing investor behavior. Students also read current journal articles on the impact of behavioral finance.

Seminar Topic #6: The Psychology of Investing

This seminar was co-taught by a partner in a small Seattle-based investment firm. Students statistically analyzed how stock market cycles are influenced by inflation. Students saw that investors are more risk tolerant with low inflation and become more risk averse with higher inflation. The actual focus, however, was broader than econometric analysis. Students began to realize that the psychology of behavioral finance and neurofinance plays an extremely important role in determining stock returns. The co-instructor, with over 20 years of experience, was of considerable value in conveying to students the human factor. Students finally began to understand the influence of greed, fear, and herd mentality as behavioral motivators.

#### **COMMONALITIES OF SEMINARS**

The PBL case seminars all involved problem-solving and decision-making in a context of business-world ambiguity. Students were presented with very little background material—by the professor or the executive, just as in business. An effective PBL facilitator provides information—often including additional questions—only to student-generated questions, which reverses the conventional classroom protocols. General criteria in selecting the seminar cases were access to information through the executive, sufficient complexity for possible multiframework analysis, and a lack of clear answers. Instead, students were required to quickly "scope out" the essential parameters of the very general assignments. Students had to initially formulate key questions for each project, before gathering and reviewing specific background information and data. Students did not necessarily benchmark their disciplinespecific knowledge at the beginning of the course but soon learned to build frameworks for thinking, rather than memorizing concepts and theories that may not apply to the question or issue at hand.

Because PBL is a pragmatic, reflective process of learning by doing, a good question leads to a better question. In addition, not all questions are of equal value or relevance; however, some questions are "great" questions that can lead to a lifetime of learning. Simply stated, a question that facilitates critical thinking and problem solving is of far more value than a question that is meant to elicit a repetition of lecture content. A great question will empower the group to "think" and become an active part of the learning and discovery process. PBL does not just give the group (team) permission to explore, discover, organize, postulate, and process—it demands it. This is an opportunity for future research.

Although assignments were not intentionally made confounding, the projects were nonetheless by nature ill defined—pushing most students out of their comfort zone. Students would quickly discover that most business decision making occurs in an uncertain environment. Students, however, often detest uncertainty—a common reaction of the human brain; and there is little uncertainty in the traditional classroom, leading students to assume that the real world must be no different. However, the cases were not just realistic; they were real and filled with ambiguity. Most important, students knew this. It quickly became an intense learning environment.

#### LESSONS LEARNED

If there is a cardinal rule for effectively designing such seminars, it is realism in all aspects of the course. Case resolution should require taking a broad, integrative, cross-functional approach while stressing professionalism and ethical considerations. Resolution should also require both teamwork and individual effort.

Learning is a journey not a destination—both for students and for faculty. They are partners on this semester-long journey, and it is an exciting and engaging learning process. Students are challenged, energized, and motivated to go beyond what they thought they could do.

An important aspect is that we find that students consistently measure up to the high course expectations and demands of these PBL seminars. Wrestling with ambiguity develops critical thinking and other skills. Students gain or improve their abilities in multiple competences required for their future career, and they are universally thankful for the experience. The open-ended seminar experience of exploration, taking initiative, and engaging with executives helps students acquire

#### Exhibit 1: Problem Solving Abilities Gained from Problem-Based Learning (PBL) Case Seminars

Organizational Sensing
• Observe an organization.
• Establish a comfort level with a corporate mentor (future boss).
• Understand the nature of the organization-history, culture, technology, goals.
Enhanced Listening and Inquiry
• Listen actively to the executive mentors, the professor-facilitator, and teammates.
• Listen carefully-since mentors provide only a general overview of the problem
and limited information.
• Ask specific, relevant questions-mentors will not provide information beyond
answering each student question.
Problem Formation
• Make a careful determination of the contextual issues.
• Use strategic problem formation to target the "real" issue-which often is not a
disciplinary (i.e., finance, prod op, etc.) one.
Research
• Collect and analyze data to better empirically define the problem.
• Review the literature to determine what is relevant.
Develop Practical, Workable Recommendations
• Develop solutions which are practical within the organization.
• Develop awareness of organizational and cultural constraints.
Persuasion in Professional Settings
• "Sell" a solution to the "boss."
• Use persuasion and professional presence.
Professional Writing
• Develop a professional rationale for a solution, utilizing advanced business
writing skills.
• Carefully edit writing-since mentors critique reports, as in a business setting.

or expand problem-solving abilities. We found that these abilities can be described generally as organizational sensing, enhanced listening and inquiry, problem formation, and work product skills. Student gains in problem-solving abilities from the PBL case seminars are summarized in Exhibit 1.

Although many authors offer suggestions for implementing PBL (see Endnotes 1 and 2), Exhibits 2 and 3 provide PBL case seminar guidelines and teaching tips that we have developed based on teaching multiple iterations of this finance seminar. Through conducting the seminars, we had our own PBL experience in arriving at our version of the PBL "toolbox" described by Ungaretti et al. [2015]. The teaching–learning process involves engaging with professionals, framing projects appropriately, using teams, and helping students incrementally through

#### Exhibit 2: PBL Case Seminar Guidelines

Engage Executives in Their Current Work
• Enlivens presentations for both executives and students.
• Heightens realism affecting student interest, motivation, and learning.
• Gives executives flexibility and controls preparation time for them.
Two or Three Projects Around a Common Theme Work Best
• Any more would require excessive time for executives.
• Fewer may not allow students to experience the full complexity of the cases and
the company environment.
Use Teams
• Approximates the actual business environment and builds team skills.
• Team-process issues tend to be mitigated by realism and motivation from using
live business cases and executives as co-professors.
Require Multiple Drafts of Reports
• Shows students that effective reports require many drafts, revisions, and careful
editing.
• Allows professor to facilitate and critique team's analysis and overall logic, as
well as offer editorial coaching on style and diplomacy.
Presentation Rehearsals
• Helps students sharpen delivery skills and anticipate key questions.
• Advance video recording aids students in critiquing themselves.
On-Site Presentations
• Corporate setting enhances realism for case analysis and presentations.
• Professional environment and dress motivates students to perform at their best.
Immediate Executive Feedback
• Probing questions from executives during presentations adds excitement and
realism.
• Immediate verbal feedback makes greater impact on student learning.
• Written constructive feedback from executives, within a week, maximizes
learning.

the process. We especially found it important to challenge students appropriately so that the tasks were neither too simple nor too difficult. Mentoring students through the process is critical to student success—otherwise they may flail for traction on the problem and fail to move forward sufficiently. A key part of mentoring students is helping students see connections of theory to relevance in practice. This relevance is more than just the current seminar case being analyzed but expands into examples of work product as portfolio examples, experience in interacting with professionals, and testing their own limits. Achievement in the face of adversity builds self-efficacy. It could also be that there is a "fun factor" involved that enhances engagement for students [see Purinton and Burke, 2018].

#### Exhibit 3: Teaching Tips for PBL Case Seminars

Challenge Students
• Emphasize problem recognition and critical question formation.
• Offer limited information and questions to be answered or issues to be resolved.
• Focus on context, culture, and competencies-beyond numbers and technical
knowledge.
• Do not let students compartmentalize into functional business roles and silos.
• Use a diverse array of readings, source materials, and databases.
Mentor Students
• Serve as project manager and mentor to help students mature professionally.
• Be a facilitator during all project phases (i.e., defining questions, data collection,
analysis and model building, and report writing and editing).
• Help students hone their skills much as a project manager works with junior
employees.
• Give sound advice and support; but teams must perform the actual analyses,
make their own recommendations, and write their own reports.
Help Students See Personal Value
• Projects are excellent additions to student portfolios to help in landing an
internship or a job, though do not let students think that the class itself will lead
to an internship or a job to prevent hyper-competition among students.
• Experience with business leaders greatly increases critical thinking and
communication skills, as well as the ability to cope with complexity and
unstructured settings.
• Help students see that they can do more than they ever thought possible. After
final presentations, students realize that they have increased self-efficacy.

#### ASSESSMENT OF LEARNING<sup>2</sup>

Although some meta-analyses examining studies of the efficacy of PBL in professional education indicate mixed results, the studies included in the metaanalyses have several issues, including using traditional assessments of content knowledge gained instead of assessing PBL learning objectives such as skill development [see Carriger, 2015]. In other words, different outcome measures are needed to capture the true effects of PBL on student maturation, long-term learning, behavioral change, and skill development, etc.

In lecture-based classes, students are rewarded or incentivized by traditional exams to learn the course material but not necessarily the process of problem solving. For PBL a different type of assessment of learning is required—one that rewards risk taking, knowledge application, decision making, and performance

<sup>&</sup>lt;sup>2</sup> For aid in developing assessment tools, see Brownell and Jameson, 2004; Duch et al., 2001; Gijselaers et al., 1995; and Segers and Dochy, 2001.

because traditional memorization is replaced by invention, exploration, question formation, making connections, application, and skill development. It is important, throughout the semester to include discussion and critical reflection on what has been learned so that students understand the breadth of their learning and transfer it to other situations [Segers and Dochy, 2001]. This process connects theory to the world of practice. One way to decrease student anxiety about these unfamiliar assessment methods and students' perceived level of risk is to have teams formally rehearse and video-record their presentations so that students are able to evaluate themselves before making final presentations to the executives and their organizations. Faculty may mentor this process by reminding students of guidelines for professional presentations, including timing, giving space to what is most important, enthusiasm, cohesion, and general structure. It may also be helpful to polish presentations (including Q&A) in front of lower-division students or related student club forums. However, non-disclosure agreements may limit these opportunities. Having other students assigned to push on possible questions is one way to help students prepare. Reviewing videos and preparatory presentations for coherence, timing, strengths, and weaknesses helps teams become unified and confident. The "we" in team efficacy is a boon to confidence and helps to overcome individual issues of anxiety.

It is also productive for students to do a formal AAR at the end of each case, so that future presentations and reports will be improved. At the end of each seminar, in addition to the instructor leading in-class reflection and privately discussing project outcomes with each team, an outside management professor interviewed the students using an AAR format. These debriefing sessions were professionally video-recorded for the participating organization and executives to view. Questions to students related to what they thought went well, recommended areas for improvement (both personal and in the PBL context], how their learning occurred, insights on increased capacity for problem solving, and overall critical reflection. Recording student responses to careful questioning provided invaluable insight into the evolving maturation level of students, revealed ways to improve the course structure and content of future seminars, and helped students realize the depth of their learning. Students commented in several ways: "The hardest thing was ambiguity, ambiguity," and "A confidence builder-real world problems, accomplished more than I ever thought I could, used skills I wasn't sure I had and knowledge gained from all my other classes." See Exhibit 4 for student comments about their PBL experience. It likewise was enlightening and rewarding for participating executives to hear firsthand the impact that their involvement had on student maturation and skill development.

In summary, we approached assessment of learning through a variety of methods, including discussion, critical reflection, dialogue with faculty and executives, practice presentations, and AAR. Discussion was embedded in the seminar nature of the course. Critical reflection occurred at multiple levels as students wrestled with problem solving and engaged with faculty and executives.

#### Exhibit 4: Sampling of Student Debriefing Comments – From Multiple PBL Case Seminars

- "Learned how to ask good questions and use creativity."
- "Dealing with ambiguity-not just one right answer (from the answer key)-but several potential ways to view the problem or issue. Can't check at the end to see if it's correct."
- "A confidence builder-real world problems, accomplished more than I ever thought I could, used skills I wasn't sure I had and knowledge gained from all my other classes."
- "The hardest thing was ambiguity, ambiguity, ambiguity'."
- "We were given the case-but were on our own to get the solution, took everything learned to date to solve the complexity of real world problems. Even had to figure out if there was a problem, and learned to ask the right questions. Had to use our own critical thinking skills. Go further than a regular class. Good, but challenging!"
- "Usually every question has a precise answer, but not here. Thought we didn't have enough information to solve the problem, but we knew enough. We were just afraid to step outside of us."
- "Case competition and constructive feedback from executives help make us ready for the real world"."

The dialogue experience with faculty and executives was both formative and summative. Practice presentations described earlier helped students become more comfortable with their task and related complexities. The AAR works best when conducted in both individual and group context. This process is further described below.

#### Learning Objectives and Outcomes

Learning objectives for PBL seminars must differ from those in lecture-based courses and center on the active, student-centered learning process involved in PBL. The learning objectives for these finance PBL seminars were: application, integration, skill development, appreciation of considerations not usually presented in finance (e.g. ambiguity, non-rational elements of problem-solving, multiple perspectives, etc.), and long-term learning (behavior change), not just concept mastery. It is important to note that students already had the basic prerequisite discipline knowledge because these were upper-level undergraduate seminars.

Further outcomes included: synthesis (e.g. screening relevant factors), prioritization (e.g. rank ordering important influences), simplification (e.g. developing frameworks about how complex systems work), analysis (e.g. using empirical evidence to test theories), communication (e.g. explaining/presenting recommen-
dations orally and in writing), and "rug time" (e.g. defending recommendations with evidence and logic, as well as persuasion and professional presence). Achieving these outcomes requires active student involvement in the PBL process.

# Student Evaluation and Grading

Assessment was embedded in the evaluation of each PBL case or project. Students were graded on presentations, papers, general engagement, and peer review. The professor and the executive generally were both involved in the assessment and evaluation process—although course grades were the professor's responsibility. Students received extensive feedback and comments from the executives on the final case reports and presentations, as well as from the professor who was also actively involved with facilitating each team's research and draft reports. Students additionally received formal and informal peer feedback on their contributions to and performance as a part of the team. Because assessment and evaluation come from the professor, peers, and the executives, this can be an advantage—360-degree feedback can be quite informative, or a disadvantage—more work for everyone and potential conflict among evaluation results. By necessity, evaluation and grading for PBL courses are different than for lecture-based courses [see Ungaretti et al., 2015]. Our grading of papers, presentations, and overall engagement was less about the "right" answers and more about initiative, exploration, polish, collaboration, and innovation.

Under such a broad evaluation process, students may become anxious about grading-although we have found students to be more performance-focused than grade-focused. They may, additionally, become frustrated with the unfamiliar PBL learning process. Thus, it is critical to educate students about the PBL process early in the semester and help them appreciate what they can gain from it [see Peterson, 2004]. It is important to be supportive of students while encouraging them to see mistakes as learning opportunities. Ongoing feedback from the professor, executive, and peers throughout the semester can help students keep track of their progress and areas for improvement. Persistent ignoring of ongoing feedback from faculty and executives did occasionally negatively affect grading. Additionally, initiative, persistence, and creativity were rewarded in grading, even if analysis and solutions were slightly off target. A welcome side outcome is that as students grapple with grade uncertainty, they are also developing skills for the world of practice where outcomes and evaluation are ambiguous. Students are, in essence, also learning skills for succeeding in uncertain environments [see Taipalus, Seppänen, and Pirhonen, 2018]. Student reflections after each case, through dialogue with faculty and executives, and at the end of the course in the AAR, were part of the structure of the PBL environment. This helps students learn "self-evaluation," an important life skill to check their self-perception against feedback from others [Brownell and Jameson, 2004].

#### SEMINAR EVALUATION

Students mature rapidly in this intense environment. Instructors readily see a positive change in their confidence and ability from presentation to presentation; both students and executives see these changes over just a few months. Perhaps this accelerated development is due to enhanced levels of student motivation to perform at a high level. We have found that when students have outside evaluators and operate in a business-world environment, they work harder, learn more quickly, and perform at a more professional level than in traditional educational settings. We make this qualitative judgment based on our small-school teaching where we have usually taught the same students previously and have an understanding of individual strengths, weaknesses, and performance. We recommend further research exploration into the role of outside evaluators and business-world PBL in achieving higher learning levels.

As a word of caution, though, in spite of the fact that the executives are responsible for much of the presentation part of the course, the actual time commitment for a professor to initiate and manage the seminar (including coordination, lining up executives and topics, assisting students with writing and research, etc.) is more intensive than that of teaching a traditional class. Also, careful selection of the partner organization, executive(s), and the problem(s) is important. The executive(s) must make a solid commitment because the effort required for close coordination with the professor, on-campus presentations, attending the final presentations, and giving summary feedback on the reports and presentations represents a 30- to 40-hour time commitment. Feedback from executives was verbal and written.

#### Reaction from Executives

Before the course began, the professor met with the executives multiple times to set expectations, answer questions, discuss course design, and so forth. Feedback from executive instructors came via interviews. All instructor executives were interviewed multiple times by the faculty member including short interviews after each student presentation, and a longer interview at the end of the course. Additionally, the professor and executives were in contact at least twice per week during the semester to discuss ongoing course issues. Outcomes of these interviews are that <u>all</u> of the executives involved emphatically said the learning exercise was extremely helpful to students and that they themselves greatly enjoyed the process. Some of the executives taught in more than one seminar, whereas others volunteered to later make a repeat teaching performance. Most expressed that wished they could have had similar experiences during their own college years.

### Reaction from Students

Student reactions were captured through end-of-course student evaluations, videotaped end-of-course all-class AAR held during the final session by thirdparty professor, AAR completed by the professor with each student team after each team presentation, and informal dialogue across the semester. AAR were conducted with a list of set questions, and thus we found common themes across the years. Example AAR questions included analyzing "what" happened, "why" it happened, and "how" it could be done better by the participants and those responsible for the next project. The use of AAR is an opportunity to build a culture of accountability.

All students (about 170) participated in these opportunities to give and receive feedback. Overall, students reacted quite positively to the PBL finance seminars. Initially in seminars issues usually arose because students were pushed out of their comfort zone and required to operate in new ways. Some students at first complained in early faculty-student dialogue about a perceived lack of course structure, because they did not receive compartmentalized, highly structured, and unambiguous lecture information clearly linked to their chosen major as they were accustomed to in traditional courses. Learning by discovery and self-exploration is often foreign to students. However, students had very favorable reactions *after* the seminars were completed, as evidenced by student comments at the concluding debriefing sessions [See Exhibit 4]. Students would also use the final case reports as part of their professional portfolios for internship and job interviews, and this was perceived by students as valuable. The pattern of responses was remarkably consistent across the years of the seminars. This included initial struggling with ambiguity and very favorable reactions after project completion. We believe this result was due to the developmental changes that occurred in students as they matured and became like "employee consultants" versus students in a typical college class. Based on feedback from the first seminars, we created a mechanism for describing to students the PBL process and how to create a framework for success.

We do not have data from more traditional lecture-based courses with which to compare outcomes. A recommended area for future research is to survey graduates regarding the long-term impact of this PBL experience. Taipalus, Seppänen, and Pirhonen [2018] suggest that PBL helps students learn about uncertainty in organizations and thus prepare them for work environments in which uncertainty is the norm.

### Limitations

Our experience is with undergraduate seminars in which most students were seniors. Students had already been exposed to the core body of undergraduate finance knowledge and analysis. The sections were smaller, with 15–20 students each, thus allowing for close faculty attention and supervision. Without additional

faculty support, we do not know if this approach would be successful with a larger class size, nor do we know if it would be problematic for executives to allow access to larger groups of students. We think it unlikely this PBL seminar approach would be successful earlier in the undergraduate experience due to the comparative lack of subject knowledge and analytical tools. Further, the faculty member must be willing to seek out and engage executives to provide the context for the PBL. This is a significant commitment. Nevertheless, students find it valuable.

### CONCLUSION

"For more than 30 years, I flogged students through exercises that promised to infect them with the bugs of inquiry and creative skepticism. Nothing was more unpopular... In the age of the Internet, pack-rat research has reached new levels of volume and waste. The standard procedure is to make a few clicks and see what turns up. For students, the process is as addictive as gambling... Their Googling produces more rambling pages sprinkled with graphics and drained of thought as if a semantic vampire had sucked them. Faced with that failure, the question arose: "How do students learn"? ... Advances in the learning sciences reveal that students are not receptacles for wisdom deposits. They decide what they will learn... The usual doesn't work... We need PBL" [Spence, 2004, p. 485-486, 488].

Faculty considering PBL may ask, "Why change the way we teach, why PBL?" [Duch, Groh, and Allen, 2001, p. 3-4]. "After all, no one thinks it's easier or takes less time. In addition, as with almost every other change in teaching, students resist it, at least at first" [Rhem, 1998, p. 1].

We, like others [e.g. Carriger, 2016; Peterson, 2004], suggest that PBL is not appropriate for all levels and types of classes. Carriger [2015] also questions the theoretical support most often used in endorsement of the PBL pedagogy [i.e. Dewey, 1938]. To build a research evidence, Carriger [2016] explores other foundations for PBL learning and suggests adapting Montessorian pedagogical theory from its original beginnings to undergraduate management education:

"Montessorian theory as applied to problem-based learning can lead to a better understanding of the effectiveness of problem-based learning, focus on more appropriate learning objectives and learning outcomes, and have implications for future research, curricular development, and assessment of learning outcomes in the management classroom" [Carriger, 2015, p. 250].

PBL would be appropriate for upper-level undergraduate courses—such as our PBL case seminars—when students need to make the transition to becoming problem-oriented and self-directed adult learners [see Carriger, 2016].

Although executive-led PBL case seminars may not be suitable for all faculty or courses, the technique certainly is an option that should be considered. Da Silva et al. [2018] describe a productive experience with entrepreneurs and managers in the classroom with real problems for analysis. Barrows [1996] states that those questioning the value of PBL are those who have neither been involved in nor observed it. He feels that once they have the opportunity to see what students can do by thinking and learning on their own, they will come to understand its potential to enhance student learning. PBL is an excellent way for students to make connections between theory and practice [Da Silva et al., 2018]. However, there are detractors and some evidence for an opposing viewpoint. Garnjost and Brown [2018] found that 300 students found no difference among PBL and faculty-centric pedagogy on key learning outcomes of knowledge acquisition, problem solving, critical thinking, teamwork, and self-directed learning.

Rhem [1998] states that uniformly PBL practitioners agree that they have seldom personally felt as energized about their teaching or seen their students so involved and motivated. Tissenbaum, Sheldon, and Abelson [2019] found that PBL helps students moving from thinking to acting. One PBL practitioner contends that when students apply knowledge and resolve problems for themselves, they "learn to think" [Pennell and Miles, 2009]. Another passionate advocate recalls, "I lectured for years, but there is something so powerful in PBL. You're never quite sure what's going to happen, but attendance is 100 percent, the students are motivated, working on problems. It has restored the intellectual excitement for faculty who said they had been burned out" (B. Duch, Associate Director of Delaware's Mathematics and Science Education Resource Center, quoted in Rhem, 1998, p. 3).

Executives reported that they wished they had had a similar experience as undergraduates. Faculty found that students consistently thanked them for the opportunity to take the course and for their learning and increased experience. Faculty also found the experience to be memorable because we were able to see the difference in the level of student performance from the beginning to the end of the semester. One faculty noted it was a highlight of his career to be able to mentor motivated students and watch their development. In sum, these PBL opportunities were a memorable experience for faculty, executives, and students.

Perhaps, though, the most compelling reason to use PBL is the enhanced confidence that students gain. Dunlap [2005] describes an empirical study she completed using undergraduate computer science students taking a capstone course in software engineering. The results indicated that the specific PBL instructional strategies of using authentic problems of practice, collaboration in problem resolution, and ongoing reflection were the catalyst for students' improved self-efficacy. As reported in the AAR, students changed their perceptions about their professional abilities. An area for future research is to follow-up with graduates about this perception.

Such behavioral change and integrated learning would be hard to match using traditional pedagogy that focuses on concept mastery. We use executive-led PBL case seminars because they do for students what traditional courses cannot do—that is, give them a greater comfort level operating in a professional business

environment. Students are more confident and prepared to make the transition from the classroom to the business world, and they will be more able to deal with the ambiguity and complex dilemmas that they undoubtedly will encounter.

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# Enhancing Team Learning Experiences in the Classroom

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There are many different and effective ways to introduce teams and team learning into our classes. This paper discusses the different ways we incorporated group and team learning in the classroom using a variety of activities. Comparing students who had no team training with students who had team training, we worked to develop a measure of team learning and group dynamics. Our findings indicate that when students perceive a fair work distribution in their teams, they perceive greater learning and group dynamics than students who perceive an unfair work distribution perceive. Further, when compared with classes in which no team training was present, students reported greater learning and group dynamics. Suggestions for enhancements to team learning and future ideas for research are discussed.

Keywords: Groups and Teams, Team Learning, Student Perceptions of Teamwork, Team Training

**Disciplines of Interest:** Business Education and Pedagogy, Team Dynamics, Career Preparation, Student Engagement

# INTRODUCTION

Working successfully in teams is a basic expectation in most organizations. In fact, according to the Society for Human Resource Management, building a culture around productive and engaging teams is one of the top labor-market trends [Benz et al., 2015/2016]. Additionally, Devine, Clayton, Philips, Dunford, and Melner [1999] suggested that 50 percent of all organizations in the United States use teams. Teams can take a variety of forms (e.g. production, professional, or managerial teams), and teams are inherent in an array of industries, from

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technology and manufacturing to the performance arts (e.g. music, film) and sports industries. As such, possessing effective teamwork skills is an important talent for the workplace. Moreover, well-functioning teams can improve employee satisfaction and work performance [Levi, 2007]. However, poor teamwork skills can lead to decreases in performance and frustration among team members. Therefore, understanding the ways in which team learning can be fostered in our classes to better prepare our students for the workplace is a topic worthy of further study.

Using teams in the classroom to enhance student learning has long received attention in higher education [e.g. Borrego, Karlin, McNair, and Beddoesc, 2013; Favor and Kulp, 2015; Michaelsen and Sweet, 2008; Michealsen, Watson, Cragin, and Fink, 1982]. Borrego and colleagues reviewed 104 studies to determine which teamwork skills instructors were trying to teach and which ineffective team behaviors were most commonly exhibited [Borrego et al., 2013]. Among their findings were learning objectives that focused on basic teamwork skills, including communication and collaboration. In addition, reducing social loafing to ensure that equal team effort was expended on projects was a key concern of instructors in the study. Similarly, Favor and Kulp [2015] noted that adult learners who were enrolled in online courses were less likely to prefer team projects because of challenges with distributing the workload equitably, a finding that was much less salient to the adult learners who attended courses on campus. This finding suggests that implementing teamwork competencies, such as effective communication and collaboration, may be more readily achieved when team learning is face-to-face in the classroom and emphasizes the fact that training students in specific teamwork skills remains an important pedagogical focus of instruction.

Given the importance of developing effective teamwork competencies, our goal was to examine the effectiveness of teams with a course design that combined informal in-class team activities with more traditional group projects and activities. Our purpose was to foster team skills and team learning by increasing students' understanding of team processes and building their collaboration skills. With this study, we contribute to team learning pedagogies by examining both students' team learning experiences and group dynamics within their teams. We also measure students' perceptions of fairness of work divided and its effects on learning and group experiences. By offering a course design with the development of team learning as its core, we seek to better prepare students for the demands of teamwork in the workplace. We also contribute to the literature by developing a measure of self- and group learning as well as group dynamics.

To accomplish our goals, we first provide an overview of team learning. This overview is followed by a summary of our learning objectives and team development approach with descriptions of the informal and formal team and group activities we use in our classes to enhance team learning. We then outline the measures we used and the results from our student perception survey of team learning. We also compare our results with data collected in earlier classes where there were no classroom activities to enhance team processes. Our discussion includes an analysis of the survey instrument, explanations of our results, comments regarding future course design, and suggestions for expanding our work in this area.

### LITERATURE REVIEW

### Team Learning and Team Dynamics

Designing curriculum and class activities to emphasize the learning and assessment of teamwork skills and collaboration is at the core of many management courses [e.g. Goltz, Hietapelto, Reinsch, and Tyrell, 2008; Kemery and Stickney, 2014]. Moreover, the Association to Advance Collegiate Schools of Business (AACSB) specifically addresses learning collaboratively in two of its accreditation standards: Standard 13 requires faculty to provide opportunities for students to collaborate and develop cooperative work skills, and Standard 14 expects students to contribute to the learning of others by actively participating in group learning experiences [AACSB, 2012]. Furthermore, as noted above, working in a team environment is increasingly commonplace in organizations, and employers expect applicants to have basic teamwork skills.

According to Peter Senge [1990], "Team learning is the process of aligning and developing the capacity of a team to create results its members truly desire" [p. 236]. In essence, learning as a team suggests that "the whole is greater than the sum of its parts" when working together on a problem. As with all newly acquired skills, teamwork and learning as a team take time and practice; there is no better place for this than in students' undergraduate classes as they prepare to enter the workforce.

One aspect of a team that enhances team effectiveness is shared cognition [Salas, Cooke, and Rosen, 2008]. Teams must be able to communicate what they know individually to each other and then to create a shared mental model. An individual on a team may know something or understand something differently than another member of the team does. Discussing information can parse what is actually known and what needs to be looked into, as well as assist in teaching various members new information they would otherwise not have at their disposal when alone. If there is no such discussion and communication, coordination of shared activities and outputs could be compromised [Salas, Cooke, and Rosen, 2008]. Therefore, one way to increase teamwork and team effectiveness is to help students create a shared cognition (i.e. creating open dialogue).

Another aspect of teams that influences teamwork is social loafing. Social loafing is when an individual puts forth less effort in a group setting than he or she would alone [e.g. Latané, Williams, and Harkins, 1979]. Latané and colleagues showed that this loss of productivity in groups was due to a lack of effort rather than a lack of coordination. In other words, when in a group or team setting, individuals may loaf because they cannot coordinate their efforts correctly. For instance, in a rope-pull game, Person A may not be able to pull a rope at 100 percent while Person B is also pulling at 100 percent. They may not know how to grip the rope, how to stand, etc. On the other hand, it could be that groups or teams know how to coordinate their efforts but lack the motivation to put forth their full effort. Latané et al. showed social loafing is due to the latter. Therefore, one way to reduce or eliminate loafing is to increase motivation. If one is able to identify each team member's individual work, social loafing is reduced [Harkins and Szymanski, 1988].

Psychological safety (i.e. "a team climate characterized by interpersonal trust and mutual respect, in which people are comfortable being themselves") [Edmondson, 1999, p. 534] is also important to a team's performance. A team cannot learn from each other and effectively perform a task without proper candor, trust, and respect. Teammates must feel as if they can say and do something within the context of the team without repercussions. For instance, group brainstorming is best achieved when evaluation of ideas is suspended [Taylor, Berry, and Block, 1958].

A final aspect that helps teamwork is fair distribution of workload. In a study of final-year undergraduate business school students at a large Australian university, researchers asked students about various predictors of their satisfaction with group work [Burdett and Hastie, 2009]. From a sample of more than 100 undergraduate students, researchers found that the significant predictors of group work satisfaction were satisfaction with workload and perception of group-based achievements (learning outcomes) [p. 68]. Additional qualitative results of the same study showed that a major barrier to students' being satisfied with their group work was having workload issues [p. 69]. Finally, students' achievement of learning outcomes as well as learning group work skills positively predicted their satisfaction. Burdett and Hastie [2009] suggest that faculty must provide support to students in terms of learning group work skills and distribution of work when students are participating in classroom teams.

The above research on teamwork and learning suggest that training (e.g. communication and psychological safety) and satisfaction with workload distribution may be beneficial to the team. Thus, we developed activities that allowed students to foster better communication (e.g. shared cognition) and train as a team. Our goal was to intentionally teach students about the benefits of working in teams. Through our intervention (described below), our goal was for students to learn to work more efficiently in teams. In the past, we

simply put students in groups to complete activities and/or projects without any team training.

### **METHODS**

Classroom Intervention: Learning Objectives and Activities

The learning objectives for our classes were to help students understand the team process and to build their collaboration skills. Additionally, we wanted to promote team learning as originally defined by Michaelsen et al. [1982]. That is, we wanted to provide a classroom experience that allows students "extensive use of problems, simulations, and experiential exercises to provide students with the opportunity to develop the ability to apply course concepts" [Michaelsen et al., 1982, p. 14].

To accomplish this goal, we first researched, developed, and introduced a brief team training that we disseminated in our courses. This involved establishing shared cognition and psychological safety. Following Michaelsen and Sweet's [2008] readiness assurance model, we administered short, five-question quizzes on a reading assignment early in the semester. When students arrived in class, they were given the quiz to complete individually (Note: Appendix A contains the short quizzes and work sheet we used in each of the following classes: Organizational Behavior, Developmental Psychology, and Sustainable Business Practices). After taking the quiz individually, students then formed small groups and completed the same quiz together. This process helped create a shared mental model (shared cognition). Students tallied their distance scores for both their individual quiz score and their group quiz score (the team training worksheet is also provided in Appendix A). As expected, most groups had better group scores than their individual scores. Students were asked to compare the scores and think of possible reasons why their group scores were either the same, higher, or lower than their individual scores. A class discussion identified each team's ideas regarding teams and teamwork. Following this activity, we led a discussion about teams and team learning with a follow-up handout summarizing our key points about working in teams (See Appendix B). We implemented this team training exercise to set the tone for the variety of team activities that we administered throughout the semester.

To establish psychological safety, students were told that team discussions should be kept confidential and that they should withhold judgment during discussions. The goal was that these ground rules would allow students to trust and respect one another. We also ensured that students understood the fact that both the professor and their fellow teammates would evaluate their individual work. During the quiz and activities, teammates could identify who knew what, who prepared for the discussion, etc. Specifically, this evaluation component could allow for a reduction in social loafing, which would improve team satisfaction if workload were divided equally.

At this point, we formed permanent teams of three to six students in each class. Throughout the semester, when we did in-class activities, we placed our students in these groups for each activity. We used a variety of team activities informal group exercises, formal graded team activities, and a longer group project. Some group exercises included asking students to read short case studies and answer questions in their groups and report out to the class (Sustainable Business Practices), a short group activity about the effects of rehearsal on memory (Developmental Psychology), and a group competition to best apply the MARS Model of Individual Behavior after viewing an episode of the television show, "*The Office*" (Organizational Behavior).

We introduced a few more formal activities that contained some elements of team-based learning. An example of this methodology in Organizational Behavior was asking student groups to solve a case called "A Tale of Two Floors: Leadership Lessons," in which students were asked to read and prepare their answers to the case questions ahead of class. In class, they first applied the Path-Goal Leadership Theory, Fiedler's Contingency Model, and the Hersey-Blanchard Situational Leadership theory could be used to suggest improvements for each leader in the case. Decisions were shared simultaneously on classroom whiteboards, followed by a class discussion of their similarities and differences. In Sustainable Business Practices, students prepared for the chapter about carbon offsetting by listing the pros and cons of the practice. Once in class, groups competed against each other in a debate, with outside judges awarding prizes to the winning group.

Contrary to true team-based learning as defined by Michaelsen and Sweet [2008], we also required a longer, more traditional group project complete with project management milestones that included two interim reports and an informal class presentation before the final due date. The same in-class groups completed the traditional group projects. In the Sustainable Business Practices class, the group project involved researching and analyzing a local company to determine how they could become more sustainable. For Organizational Behavior, the group project consisted of identifying the formal and informal aspects of an organization of their choice. In Developmental Psychology, students prepared a group paper and presentation on the indicators and interventions surrounding aggression. At the end of the semester, we collected survey data about students' perceptions of their team experiences.

### Materials and Participants

To assess the two general learning objectives (understanding team processes and building collaboration skills), we collected data using a student survey that addressed students' perceptions of their team experiences during the semester. Specifically, to assess the extent to which the various team activities helped students understand the team process, we focused on questions that tapped into students' satisfaction with their group/team work and how much students learned from their group/team work. We also assessed collaboration through students' satisfaction with team learning based on their perceived contribution to the group project.

We administered a survey at the end of the semester using a 7-point Likert scale with anchors of Strongly Disagree and Strongly Agree. Two examples of items were: "I learned a lot about the topics from my group project" and "Most of my learning was from my own research." In addition, we asked students to indicate the percentage of work they did on their final group project as well as the percentage of work each additional teammate completed on their projects. The survey can be found in Appendix C.

A total of 109 students completed the survey in courses where team development was discussed (team training). However, because all of these students were from courses with team training, we were unable to examine the difference between including team training and not including team training. Therefore, a control group was implemented; we had classes that completed group activities and a larger group project but did not go through the team training mentioned above. This control group included 153 undergraduate students in classes similar to the ones we were teaching but which had taken place in previous semesters, had contained similar group and team activities, and had not included specific team training.

The data from students who experienced team training were collected after the control data, and, as such, we added some items to our survey. For this analysis, we used only items that appeared in both data collections. In total, 11 survey items were analyzed. These data can be found in Appendix C.

### RESULTS

We collected a total of 262 surveys across five class sections (two from Developmental Psychology, two from Organizational Behavior, one from Sustainable Business Practices). In addition to adding some items to the survey between the control and team-training conditions, we also changed the scale from a 5-point scale to a 7-point scale. Due to these differences in scales, we *z*-transformed all survey data to examine all of our data together and compare them in a meaningful way.

To provide feedback on our learning objectives and to test the validity of our survey, we first performed a factor analysis of the survey items to determine if any underlying constructs existed. Given the results of the factor analysis, we present our descriptive statistics and report on the results from the one-way analysis of variance (ANOVA).

# Table 1. Rotated Components with a Factor Load Matrix for the Two<br/>Components

Questionnaire Item	Factor 1	Factor 2
	(Learning)	(Group Dynamics)
1. Most of my learning was from my own research.	.530	
4. I learned a lot from the work done by other	.581	
members of my group.		
5. I learned a lot from other groups' presentations.	.650	
7. I worked hard on this project.	.823	
9. I would recommend this project to other	.641	
students.		
10. The instructions for the project were clear.	.708	
11. The professor gave us all of the support we	.781	
needed to complete the project.		
2. Our group did most of the research for the		.493
project in the last 2 weeks. <sup>a</sup>		
3. Our group had big problems caused by one or		.737
more "freeloaders." <sup>a</sup>		
6. My group members became a cohesive team		.644
through working on this project.		
8. I enjoyed working with my teammates.		.656

Notes: <sup>a</sup>These items were reversed scored before all analyses.

# Factor Analysis of Teamwork Variables

Because the scale designed to measure student perceptions of their teamwork experiences was newly developed, we first performed a factor analysis to determine the underlying constructs measured by the individual items. We performed a factor analysis of these 11 items, because it is a useful way to ascertain whether groups of single items on a scale measure underlying constructs and thus warrant the reduction of several questions into a smaller number of factors [Hair, Anderson, Tatham, and Black, 1998]. Because two of these questions ("Our group did most of the research for the project in the last 2 weeks," and "Our group had big problems caused by one or more freeloaders,") were worded negatively, they were reverse-coded prior to entering all 11 items into the factor analysis with a Varimax rotation. The rotated component two-factor matrix can be seen in Table 1.

As shown in Table 1, the first factor included seven items and represented a measure of learning from the group work or the group projects. Cronbach's Alpha for this factor was a healthy 0.820. A second factor consisting of four items represented overall group dynamics. Cronbach's Alpha for this factor was a moderate 0.698. These two factors were labeled Learning and Group

Factor	Mean	SD	1	2	Cronbach's alpha
1. Learning	027	.709		.56*	.820
2. Group Dynamics	045	.742	.56*		.698

Table 2. Correlations Betwee	een Factors
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Notes: \*p < .001

Dynamics, respectively. The means, standard deviations, Cronbach's Alphas (for the two factors), and correlations are reported in Table 2.

### Perceived Fairness of Work Divided

Students reported, in percentages, the extent to which they and the other group members contributed to the project. We were interested in whether participants perceived this division in work to be fair, and, more important, whether this fairness differed according to the different factors (Learning and Group Dynamics). We coded fairness as 0 (unfair: work was not divided evenly among members) or 1 (fair: work divided evenly among members) for all students. We then ran a one-way ANOVA with fairness and condition (control versus experimental team training) as the independent variables and the two factors as the dependent variables. The ANOVA results are reported in Table 3. We found a main effect for fairness, such that those who reported a fairness in the work divided also reported significantly higher scores on the Group Dynamics factor than did those who reported unfairness in the work divided, F(1, 258) = 36.38, p-value < 0.001. We also found main effects for condition for both factors. Students who received team training reported higher scores on the Learning factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, and the Group Dynamics factor, F(1, 258) = 252.01, p-value < 0.001, 258) = 87.45, p-value < 0.001, than did those who did not receive the training (i.e. the control group). No other main effects or interactions were found, p-value 0.066.

### Training Effects

To analyze whether the team training influenced the factors of learning and group dynamics, we ran an ANOVA examining differences on the two factors (see Table 3). The results revealed a significant difference between training and control conditions for both factors. Those who received the training reported that they learned significantly more than control students, F(1, 258) = 252.01, *p*-value < 0.001. Additionally, those who received the training reported significantly more positive group dynamics than control-group students, F(1, 258) = 87.45, *p*-value < 0.001.

# Winter 2019

# Table 3. ANOVA Between the Factors, Conditions, and Fairness of Work Divided

Factor	Reported Fairness in Work Divided <sup>a</sup>	Reported Unfairness in Work Divided <sup>b</sup>	F	df	р
Learning	09 (.71)	.07 (.71)	.12	258	.735
Group Dynamics	.09 (.69)	25 (.78)	36.38	258	< .001

	Control Condition <sup>c</sup>	Team Training Condition <sup>d</sup>	F	df	р
Learning	45 (.42)	.57 (.59)	252.01	258	< .001
Group Dynamics	33 (.55)	.36 (.79)	87.45	258	< .001

Notes: Standard deviations are in parentheses.

 ${}^{a}n = 158.$  ${}^{b}n = 104.$ 

 $^{c}n = 153.$ 

 $^{d}n = 109.$ 

### DISCUSSION

From our survey, two main factors emerged. The first factor represents a measure of positive learning (Learning), the second a positive dynamic between team members (Group Dynamics). The identification of a two-dimensional teamwork experience scale is a positive contribution to the study of teamwork and team learning, even though there have been multiple scales measuring group and team experiences. For example, Gardner and Korth's [1998] scale measures attitudes toward group work; and Marshall, Serran, and Cameron's [2010] and Park and DeShon's [2010] scales measured team satisfaction. The items included in our measure show similarities to these established measures (e.g. "Group work helps me learn better" from Gardner and Korth compared with "I learned a lot from the work done by other members of my group"; "All in all, how satisfied are you with your members in your team?" from Park and DeShon compared with "I enjoyed working with my teammates"). Our study extends these works by (1) developing a new measure of positive learning in groups, and (2) combining both learning and group dynamics together. Future studies of students' team-learning perceptions could include additional items measuring these two constructs, as well as establishing validity and reliability of the current measure. Future studies should also include objective data, such as group grades and other independent measures of team success.

We also found that the team training affected both learning and group dynamics. Students who went through the training and gained insight and skills involving shared cognition, social loafing, and psychological safety reported that they learned more and had better group dynamics than those who did not receive the training. These findings suggest that simply going through a few aspects of what makes a good team can influence behavior within and satisfaction toward the team.

Students who believed the work was divided fairly among its members also reported experiencing more positive group dynamics. Such responses are consistent with past research on social loafing and satisfaction. Burdett and Hastie [2009] suggested that workload distribution is important to team satisfaction. Additionally, students' learning of group work skills positively predicted their satisfaction [Burdett and Hastie, 2009]. In the current study, students felt more cohesive and positive toward the team when they also perceived less social loafing or free riding.

An important aspect of developing team skills is the use of a peer-review system throughout team learning activities [Michaelson and Sweet, 2008]. This process is something to be considered in subsequent course design. Almost half of our students reported an unfair work distribution after having worked with their groups throughout the semester. If we adopted a peer-review process, those numbers might decrease (given the "freeloaders" might change their behaviors when called out). It follows that students would have a more positive view of their team experiences. Additionally, many employers use 360-degree and/or peer-review processes. Using peer reviews in their academic teams would prepare our students for this important aspect of their future workplaces.

A future study could have classrooms focus on one type of group activity mentioned in this paper. We used a variety of team experiences in our classrooms. It would be interesting to focus on only one type of team experience (i.e. project-based learning, team-based learning, in-class activities, broad semesterlong group projects) in our course design to determine whether team learning occurs better with one type of team activity versus another. Using the measures developed in this study would be a helpful tool for educators to quickly assess team learning and group dynamics in their classes.

Given the increasing emphasis on both assessment and assurance of learning in our business curriculums, the measures developed in this study can be examined for viability in a university's assessment process. Our measures might complement the work of both Burdett and Hastie [2009] and Kemery and Stickney [2014] and add to their multifaceted approach to assessing teamwork and satisfaction with group work. Kemery and Stickney's measures included teamwork knowledge and peer and self-appraisals. Burdett and Hastie's [2009] measure included workload satisfaction and learning outcomes gained from group work. Our measures of self- and group learning and group dynamics could add another dimension to both analyses of student achievement and satisfaction with group work. Future studies might incorporate both measures.

The findings in this study are good news for advocates of teamwork, collaboration, and team learning. When given a short training and a variety of team activities in their classes, the majority of students gained something from the experience. As our students graduate and move into collaborative workplaces, it is important for undergraduate business schools to continue to develop curriculum that anticipates these needs. As mentioned earlier, collaborative assignments and projects are thought to have great impact on students during their college years [Kuh, 2008]. Additionally, AACSB standards require faculty to provide opportunities for students to collaborate and develop cooperative work skills and expect students to contribute to the learning of others by actively participating in group learning experiences [AACSB, 2012]. Our study helps educators understand, implement, and measure team learning experiences in our classes.

There is clear motivation and interest to continue developing pedagogies that emphasize the development of teamwork competencies and learning in teams. Going beyond team activities as independent learning experiences in the classroom, team-based learning is a systematic teaching strategy in which team activities are designed in a particular sequence with the goal of developing groups into collaborative teams [Fink, 2013; Michaelsen, Knight, and Fink, 2004]. Team-based learning is "a structured, small-group learning method that has been associated with a variety of positive student outcomes, including increased attendance, improved student preparation for learning, increased achievement, and development of student collaboration skills" [Michaelsen and Sweet, 2008]. In the future, instructors could potentially eliminate the large group projects in their classes and opt for smaller, in-class team-based learning activities to further enhance students' teamwork skills. In fact, many of the activities that are currently used in our classes can be easily transformed into standard team-based learning 4-S application activities (4-S requires student teams to address a Significant problem or question, all work on the Same problem or questions, make a Specific choice, and Simultaneously report these choices to the class as a whole). A future study could use the measures developed here and add measures to ascertain additional skill development from working with teams (e.g. professional skills, quality of team learning, team satisfaction).

### CONCLUSION

In conclusion, our findings showed that using a simple team training at the beginning of a class has a positive impact on student learning and group dynamics. We provided guidelines for easy implementation of this training across multiple disciplines. Additionally, we gained an understanding of students' perceptions of the ways in which they benefit from team training. Educators can use our examples in their classrooms to promote better team experiences and increased student collaboration skills.

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# **APPENDIX** A

### **Team Development Training - Readiness Assurance**

Students answer questions individually first, then answer the same questions in their groups

Use table to fill out their individual scores, groups scores, and difference scores

Discuss questions in their groups

Follow Up with Handout on Team process and Project Management basics (see Appendix B)

# Sample Multiple Choice Questions from Organizational Behavior

1. Assisting coworkers with their work problems, adjusting one's work schedules to accommodate coworkers, and showing genuine courtesy toward coworkers are some of the forms of:

- A. role perception.
- B. counterproductive work behaviors (CWB).
- C. task performance.
- D. organizational citizenship behavior (OCB).
- E. job matching.

# 2. According to the "Big Five" personality dimensions, people with low conscientiousness tend to be:

- A. uncooperative and intolerant of others' needs.
- B. careless, disorganized, and less thorough.
- C. more suspicious and self-focused.
- D. poised, secure, and calm.
- E. more resistant to change and less open to new ideas.

# 3. Which ethical principle reflects the idea that people have entitlements that let them act in a certain way?

- A. Utilitarianism
- B. Individual rights
- C. Moral intensity
- D. Distributive justice
- E. Care

### 4. Senior executives at CyberForm must make a decision that will affect many people, and the decision may produce good or bad consequences for those affected. This decision:

- A. has a high degree of ethical sensitivity.
- B. is one in which decision makers should rely only on the utilitarianism rule of ethics.
- C. has a low degree of ethical sensitivity.
- D. has a high degree of moral intensity.
- E. is one in which decision makers should rely only on the consequential principle of ethics.

# 5. Etoni is a new employee who comes from a culture that values respect for people in higher positions and values the well-being of others more than goal achievement. Etoni's culture has:

- A. high power distance and a strong nurturing orientation.
- B. high collectivism and a short-term orientation.

- C. low uncertainty avoidance and high individualism.
- D. low power distance and a strong nurturing orientation.
- E. high power distance and a weak nurturing orientation.

# Sample Multiple Choice Questions from Developmental Psychology:

# 1. Which of the following is NOT an example of one of Bronfenbrenner's five socially organized subsystems?

- A. microsystems
- B. chronosystems
- C. exosystems
- D. minorsystems

# 2. Proximal processes are:

- A. strange behavior of children in strange situations with strange adults.
- B. parent-child activities.
- C. enduring forms of interaction in the immediate environment.
- D. child-child activities.

# 3. The Ecological systems approach to human development considers the ecological environment:

- A. the mother's education level within a family structure.
- B. a set of nested structures inside of one another.
- C. a set of proximal processes.
- D. strange behavior of children in strange situations with strange adults in a brief timeframe.

# 4. In the Children of the Garden Island study, researchers noticed what trend as the children approached the age of 18:

- A. socioeconomic status and family stability had no influence on the children's development.
- B. children who experienced stressful life events rarely recovered from them.
- C. developmental outcomes for biological risks were dependent on the quality of the rearing environment.
- D. resiliency developed in all 698 study participants, regardless of family risk.

# 5. The main findings from the Children of the Garden Island study are:

- A. when a balance between stressful life events and protective factors is favorable, successful adaptation is possible for children.
- B. other people in a child's life-grandparents, older siblings, day-care providers or teachers-play no role in child development.

- C. even when an insignificant amount of nurturing is available, children can adapt to changes in their environment.
- D. risk factors in the lives of children had no impact on increased vulnerability.

# Sample Multiple Choice Questions from Sustainable Business Practices:

# 1. Which of the following is NOT one of the approaches to systems theory that Porter and Cordoba talk about in their article?

- A. interpretive
- B. Complex Adaptive Systems
- C. postmodern
- D. functionalist

# 2. Using appreciative inquiry into others' positions to develop a collaborative plan is an example of using which approach to sustainable education?

- A. Complex Adaptive systems.
- B. Sustainable Education.
- B. Functionalist.
- D. Interpretive.

# 3. An example of an activity or projects using the Complex Adaptive Systems approach would be:

- A. The Natural Step Program.
- B. Interviewing campus stakeholders about their sustainability views.
- C. Developing an environmental improvement plan.
- D. Implementing a sustainability initiative on campus.

# 4. A weakness of the interpretive approach to sustainable education is:

- A. it assumes eventual consensus and improved sustainability results.
- B. it oversimplifies social and human factors.
- C. it is well suited for today's turbulent marketplaces.
- D. it was developed from the Frankfurt School.

# 5. Which if the following statements is TRUE:

- A. Functionalists assume that all problems are linear and clear.
- B. Functionalists assume that meaning is subjective, socially constructed, and not self-evident.
- C. Functionalists are wrong.
- D. Functionalists build and empower learning networks and bottom up processes.

# **Group Quiz Score Sheet**

Items	Step 1	Step 2		
	Individual Answer	Group Answer		
	$\mathbf{X} = \text{Incorrect}$	$\mathbf{X} = $ Incorrect		
	= Correct	= Correct		
Q1				
Q2				
Q3				
Q4				
Q5				
Step 3	Individual Score:	Group	Which is higher?	Individual
Number Correct		Score:	(circle one)	Group

# Write down, and then discuss the following:

Ideas why your individual score is higher than the group's: Ideas why the group's score is higher than your individual score: Ideas why the group and individual score might be the same: How will you learn as a team in the future?

# **APPENDIX B**

### Sample Handout On Team Processes And Project Management

### **Group/Team Process**

- Groups develop over time. Stages of group development are as follows: • Forming – discover expectations, test behavioral boundaries
  - Storming influence goals, define team roles, establish norms
  - Norming establish roles, agree on objectives, develop cohesion
  - Performing task-orientation, efficient coordination, cooperation and trust
  - Adjourning once the project/ class ends, the team disbands
- When working in teams, consider the following:
  - Set ground rules and expectations upfront
  - $\circ$  Learn from each other
  - Learn from your past experiences in groups

# Things to Remember about Group Work

• Everyone brings different skills and knowledge to your group. You can learn from each other.

• Have a plan and be ready to adjust it.

• "Check-In" and "Check-Out" before and after meetings – this provides an opportunity for all group members to have a voice and for the group to adjust their process to enhance the project.

• Use Peer Feedback - during and after your project. More about this later.

### **Characteristics of a Good Project Plan**

- Provide many tasks and many details
- Written down
- Alternate leaders for each task
- Reasonable deadlines and due dates for each task
- For group papers, assign "proofread/edit" as a task
- For group presentations, have a task for practicing your presentation

### Example of a Project Plan:

TASK	LEAD	ASSIST	Notes:	Due Date
1. Group Meeting #1	Suzie	All	To establish ground	9/25 @ 8 p.m
			rules, create	Library
			a plan, assign	
			tasks	
2. Research on	Martha	none	Share on	9/30/19
Topic 1			google drive	
3. Research on	Fred	Judy	"	9/30/19
Topic 2				
4. Research on	Judy	none	"	9/30/19
Topic 3				
5. Written Draft	Suzie	Suzie, Martha		10/7/19
of paper				
6. Group Meeting #2	All	All	Begin	tbd
			presentation	
7. Proofread/Edit Final	Suzie	Martha, Judy		tbd
Draft				
8. Practice	All	All		tbd
Presentation				
9. Etc.				

### **APPENDIX C**

### **Group Participation Survey:**

Your responses are confidential, the information you provide will not be associated with your name in any report of the results. Please consider your group

project as well as in-class group assignments in your class while completing the questions below. You are free to decide whether or not to participate. A decision not to participate will not adversely affect any interactions with the instructor, investigator, or any representative/employee of \_\_\_\_\_ College. It will not adversely affect your standing in the course. The instructor will not know who has participated and who has not participated in the study.

Please estimate the contribution of each member of your group (including yourself) to the total final project. (Percentages should total to 100 percent)

I contributed % of the total project.

Group member 2 %

Group member 3 % %

Group member 4

TOTAL = 100 percent

Please rate the extent to which you agree with each of the following statements:

### Circle one of the numbers opposite each of the statements that follow.

	Strongly Disagree	Strongly Agree		
1. Most of my learning was from my own research.	1 2 3 4 5 6 7			
2. Our group did most of the research for the project in the last 2 weeks.	1 2 3 4	1567		
<ol> <li>Our group had big problems caused by one or more "freeloaders"</li> </ol>	1 2 3 4	1567		
4. I learned a lot from the work done by other members of my group.	1 2 3 4	1567		
5. I learned a lot from other groups' presentations.	1 2 3 4	567		
6. My group members became a cohesive team through working on this project.	1 2 3 4	1567		
7. I worked hard on this project.	1 2 3 4	1567		
8. I enjoyed working with my teammates.	1 2 3 4	567		
9. I would recommend this project to other students.	1 2 3 4	567		
10. The instructions for the project were clear.	1 2 3 4	567		
11. The professor gave us all of the support we needed to complete the project.	1234	1567		

# Business Communication Courses: Do They Make A Difference In Writing Skills?

#### Dennis Bline and Xiaochuan Zheng Bryant University

This study investigates whether a business communication course increases CPA exam performance. By examining more than 50,000 2011–2013 first-time exam sittings, we find that candidates whose university requires a business communication course scored higher on the Business Environment and Concepts (BEC) section than students who attended a university where such a course is not required. Control variables are the average SAT scores of entering students, Association to Advance Collegiate Schools of Business (AACSB) accreditation (college and department), age, and gender. This investigation sheds light on whether a required business communication course increases student written communication skills. It also contributes to the existing literature on the determinants of CPA exam success.

Keywords: Business Communication Course, CPA exam, Written Communication Skills Disciplines of Interest: Accounting and Communication

#### **INTRODUCTION**

Accounting academics and practitioners agree that writing skills are important. Research into the importance of accountants' written communication began more than 50 years ago when a sample of academics and practitioners ranked written and oral communication as the top skill for entry-level CPAs [Roy and MacNeill, 1967]. This line of inquiry has carried forward with numerous studies investigating the opinions of academics, practitioners, and students about the importance of communication skills. The inquiry has also evolved into studies of accounting curricula to investigate communication from learn-to-write (LTW), write-to-learn (WTL), and combined perspectives.

Because studies of writing in the accounting curriculum have typically been conducted at a single university, or on occasion at a small number of universities,

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they have often been designed for internal but not generalizable validity. The current study addresses the generalizability issue by investigating student communication ability across many universities via investigating CPA candidate performance in writing on the CPA exam. This investigation sheds light on whether a required business communication course is effective in increasing student written communication skills.

# BACKGROUND

As with virtually all skills, communication skills evolve with repeated instruction and practice. At the university level, writing skills have traditionally been the focus of English and business communication courses. In such courses, students would typically refine their skills in techniques such as developing and supporting a hypothesis, organizing a written document, and writing to an appropriate audience. In classes outside English/business communication, students would often be asked to write, but the assignment would focus the students' attention on demonstrating understanding of the subject matter of that course, rather than demonstrate their writing ability. The opinion of some faculty outside English/business communication courses has often been that the instructors are supposed to help students understand the discipline (e.g. accounting) and that it is not their responsibility to teach the students English.

### Writing to Learn

The approach in which students are required to write about subject matter became known as writing to learn (WTL). WTL studies have generally used informal, ungraded assignments in the belief that writing about accounting will increase understanding and improve student participation in the learning process. This approach has been considered in numerous studies to examine whether students learn accounting better when they are required to write about the technical material [e.g. Baird, Zelin, and Ruggle, 1998; Cunningham, 1991; Stout, Sumutka, and Wygal, 1991]. Anecdotal evidence indicates that students participating in WTL experiences reduced memorization and developed a deeper thought process in understanding the accounting material [Cunningham, 1991]. Baird, Zelin, and Ruggle [1998] found statistical support for the assertion that writing to learn was most beneficial for students who were performing at a level lower than the class average.

# Learning to Write

Learning to write (LTW) activities are usually quite different from WTL activities because the LTW activities tend to focus on areas familiar to the students so they can focus on improving the content, organization, and grammar

of the written document. Business communication courses generally focus on an LTW approach. Given the emphasis on the CPA communication assessment on structure and grammar, the CPA exam generally evaluates communication consistent with an LTW approach. When teaching communication skills with an LTW approach, detailed feedback on writing is needed, and a writing expert is used in some studies [e.g. Mohrweis, 1991; Johnstone, Ashbaugh, and Warfield, 2002; Graham, Hampton, and Willett, 2010; Christensen, Barnes, and Rees, 2004]. Graham, Hampton, and Willett [2010] discovered that students' performance on exercises in which they were required to identify grammar errors in writing samples improved after the LTW intervention; however, the analysis did not support improved grammar when comparing pre- and post-LTW intervention writing samples.

#### Learn to Write/Write to Learn

There have been a few studies where the LTW and WTL approaches were combined in a single study. The issue with these endeavors is that the resources needed to implement this kind of approach can be substantial. In some instances [e.g. Riordan, Riordan, and Sullivan, 2000; Ashbaugh, Johnstone, and Warfield, 2002], the accounting faculty graded the papers for content (WTL), and the writing specialist graded the paper for grammar (LTW). Another level of combining the approaches that requires even more resources entails the programs that have established a writing lab to help students with their writing. This approach has been found to be effective and result in improved student writing, but it also increases the cost substantially [Ashbaugh, Johnstone, and Warfield, 2002].

#### Writing and the CPA Exam

The CPA exam has always tested technical material in depth. In 2004, a change was made to also include writing skills on the exam. The writing portion of the CPA exam evaluates the candidate's ability to write in a manner that is appropriate for the audience and has correct structure and grammar. The writing portion is not evaluated on technical knowledge, although the candidate must write about the appropriate subject matter. Because the writing is evaluated primarily on structure and grammar, the writing portion of the CPA exam is generally machine graded. This approach helps to remove personal biases that may exist in individual graders and results in the grading criteria being applied more consistently across candidates.

In 2004, the writing component of the CPA exam was divided among the four sections of the exam and accounted for 5 percent of the score on each section. In 2011, the entire writing component of the CPA exam moved to the Business Environment and Concepts (BEC) section, where it now accounts for 15 percent of that section's score. As a result, writing has become important in a student's preparation for the BEC portion of the exam.

Previous studies have not examined how writing instruction affects CPA exam performance. Universities differ as to whether a business communication course is required of all accounting majors. Students who receive this instruction can be expected to be better prepared to write in a business context than students who have not taken a course of this nature. Given that the BEC section contains all the writing examination, that section would be the place where an investigation of writing instruction on the CPA exam should occur. Based on the above discussion, we specify our hypothesis as follows:

H1(a): For the BEC section of the CPA exam, students who have taken a business communication course will perform better than students who have not taken a business communication course.

The other three sections of the CPA exam (Attestation and Auditing [AUD], Financing Accounting and Reporting [FAR], and Regulations [REG]) do not contain an assessment of writing skills. In these sections, candidates are evaluated on their technical knowledge and their ability to conduct research and apply other skills such as analysis of spreadsheets. Given that written communication is not part of the evaluation criteria for these three sections of the exam, candidates who earn a degree at a school where a business communication course is required would not be expected to earn a score different from those who earn a degree at a school where a business communication course is not required. As a result, we propose the following hypothesis:

H1(b): For the AUD, FAR, and REG sections of the CPA exam, students who have taken a business communication course will perform similarly to students who have not taken a business communication course.

# METHODOLOGY

We obtained data on candidate exam performance from the National Association of State Boards of Accountancy (NASBA). Our sample consists of candidates who took any part of the CPA examination for the first time during the period 2011–2013. The NASBA also provided data on the candidate's age, gender, and university. Data on whether the curriculum at that university required candidates to take a course in business communication was gathered from the respective university's web site. In addition, the average incoming student SAT scores were collected from www.collegedata.com, as provided by the respective colleges and universities. The Hasselback directory was used to gather college and department Association to Advance Collegiate Schools of Business (AACSB) accreditation data. International candidates as well as candidates who reported attending an undergraduate institution that was not included in the Hasselback directory were excluded from our analysis, resulting in a final sample of 50,000 to 60,000 unique first-time examination sessions for each section of the CPA

Variable	Operational Definition
SCORE	The candidate score (ranging from $0-100$ ) on the
	CPA exam. Obtained from the NASBA.
BUS_WRITING	An indicator variable, coded as 1 if the candidate
	attended an undergraduate university where a
	Business Communication course is required.
SAT	Average combined SAT score (verbal and math)
	from the candidate's undergraduate university.
	Obtained from collegedata.com.
AACSB	An indicator variable, coded as 1 if the candidate's
	undergraduate university has college of business
	AACSB accreditation. Obtained from Hasselback
	[2012].
ACG_AACSB	An indicator variable, coded as 1 if the candidate's
	undergraduate university has accounting
	department AACSB accreditation. Obtained from
	Hasselback [2012].
AGE	The candidate's age. Obtained from the NASBA.
GENDER	An indicator variable coded as 1 if the candidate is
	female. Obtained from the NASBA.
RANK_PROGRAM	The rank of a school's accounting program.
	Schools without ranking are assigned the lowest
	rank. Obtained from the Businessweek [2013]
	accounting program ranking.

# Table 1. Operational Definitions of Variables

exam. Table 1 provides the operational definition for our variables, whereas Table 2 provides descriptive statistics.

The descriptive statistics in Table 2 Panel A indicate a business communication course was part of the required curriculum for approximately 55 percent of the CPA exam candidates (52 percent of the programs). Candidate performance for a first sitting of an examination section over the 2011–2013 period was strongest on the BEC section of the exam (mean score of 76.13), followed by the AUD section (mean score of 73.52). Over this period, candidates performed less strongly on the REG and FAR sections of this examination (mean scores of 72.02 and 71.36, respectively). The average SAT score of candidates taking the CPA exam for the first time is about 1,140. Approximately 88 percent (55) of the candidates received an undergraduate degree from a university that had AACSB Business School (Accounting Program) accreditation. The average age of the candidates taking the CPA exam for the first time was about 27 years. In addition, around 39 percent of the candidates were female.

		BEC		AUD		FAR			REG			
Variable	Mean	Std Dev	Median									
SCORE	76.13	12.68	79	73.52	16.21	75	71.36	16.30	76	72.02	14.82	75
BUS_WRITING	0.55	0.50	1	0.54	0.50	1	0.54	0.50	1	0.55	0.50	1
SAT	1141.78	112.77	1140	1139.56	112.24	1137	1140.30	112.71	1137	1140.70	112.64	1139
AACSB	0.88	0.33	1	0.88	0.33	1	0.88	0.33	1	0.88	0.33	1
ACG_AACSB	0.55	0.50	1	0.55	0.50	1	0.55	0.50	1	0.55	0.50	1
AGE	26.95	6.10	24	27.11	6.25	25	27.10	6.24	25	27.20	6.25	25
GENDER	0.39	0.49	0	0.40	0.49	0	0.39	0.49	0	0.39	0.49	0
RANK_PROGRAM	91.79	42.03	124	92.82	41.56	124	92.42	41.77	124	92.23	41.84	124
N	52,522			60,255			56,834			57,473		

# Table 2. Panel A: Descriptive Statistics by Section

See Table 1 for variable definitions.

#### Panel B: Quartiles of SCORE by Section

SCORE	BEC	AUD	FAR	REG
Minimum	0	0	0	0
Lower Quartile	71	65	63	65
Median	79	75	76	75
Upper Quartile	85	86	83	83
Maximum	97	99	99	99

See Table 1 for variable definitions.

Table 2 Panel B further demonstrates the distribution of exam scores by each section. As reported in Table 2 Panel B, the minimum, median, upper quartile, and maximum are similar across sections, whereas the lower quartile (71) in BEC is much higher than those of other sections.

### RESULTS

The hypothesis is tested using the following regression model:

SCORE =  $\beta 0 + \beta 1$  BUS\_WRITING +  $\beta 2$  SAT +  $\beta 3$  AACSB

+  $\beta$ 4 ACG\_AACSB +  $\beta$ 5 AGE +  $\beta$ 6 GENDER.

The model tests for the significance of the requirement of a business communication course after controlling for the university selectivity (SAT), college accreditation (AACSB), department accreditation (ACG\_AACSB), candidate age (AGE), and candidate gender (GENDER). Table 3 presents the results of the test.

For the BEC section of the exam, the results indicate that the required business communication course has a statistically significant positive relationship with the test score on the CPA exam. Candidates who attended a university with a required business communication course scored 0.40 higher on the BEC section of the exam (*p*-value < 0.0001). This result is consistent with Hypothesis 1(a).

*Dependent variable:								
SCORE by section								
	BEC		AUD		FAF	Ł	REG	
	Parameter		Parameter		Parameter		Parameter	
Variable	Estimate	p-value	Estimate	<i>p</i> -value	Estimate	p-value	Estimate	<i>p</i> -value
INTERCEPT	62.04	<.0001	55.82	<.0001	59.03	<.0001	62.52	<.0001
BUS_WRITING	0.40	0.0004	0.27	0.0574	0.33	<.0.0218	0.00	0.9900
SAT	0.02	<.0001	0.02	<.0001	0.02	<.0001	0.01	<.0001
AACSB	2.07	<.0001	2.06	<.0001	2.15	<.0001	2.10	<.0001
ACG_AACSB	0.95	<.0001	0.69	<.0001	0.90	<.0001	0.64	<.0001
AGE	-0.31	<.0001	-0.23	<.0001	-0.29	<.0001	-0.16	<.0001
GENDER	-2.97	<.0001	-1.73	<.0001	-2.88	<.0001	-1.96	<.0001
RANK_PROGRAM	-0.02	<.0001	-0.02	<.0001	-0.02	<.0001	-0.01	<.0001
State fixed effect	Controlled		Controlled		Controlled		Controlled	
Adj. R <sup>2</sup>	0.14		0.07		0.08		0.05	
N of observations	52,522		60,255		56,834		57,473	

Table 3. Multiple Regression Results

See Table 1 for variable definitions.

For the AUD, FAR and REG sections of the CPA exam, the results in Table 3 provide no strong evidence that the required business communication course make a difference on the CPA exam scores. For REG, the variable BUS\_WRITING is insignificant with *p*-value of 0.9900. For AUD and FAR, the effect of BUS\_WRIT-ING on the test score is greater but still insignificant at the 0.01 significance level. Given the huge sample size, it is reasonable to use a 0.001 significance level for each variable. These results are consistent with Hypothesis 1(b).

In addition, the demographic variables support findings in previous studies on CPA exam performance. The university selectivity, measured by average entry SAT scores, is a strong predictor of scores on all sections of the CPA exam (*p*-value < 0.0001) [Raghunandan, Read, and Brown, 2003]. Candidates at schools with higher entry SAT scores earn higher scores on the CPA exam. Entry SAT scores are for all first-year students, not accounting students, so the measure is an overall measure of university selectivity. Specific information about business and accounting students is not available. Even though prior research has resulted in conflicting findings [Grant, Ciccotello, and Dickie, 2002; Boone, Legoria, Seifert, and Stammerjohan, 2006], this study finds that college (*p*-value < 0.0001) and department (*p*-value < 0.0001) AACSB accreditation are significant for all sections of the CPA exam. Candidates who earn a degree from a college/department with AACSB accreditation earn a significantly higher score on each section of the CPA exam.

On the other hand, age has a significant negative relationship with the score earned on each section of the CPA exam, with the score on the BEC section decreasing 0.31 points per year of age (*p*-value < 0.0001). This finding could be indicative of candidates who waited for some time after completing their degree to sit for the exam, or it could be a result of students who need to attend college on a part-time basis. Regardless, older candidates tend to score lower on the CPA
exam. In addition, female candidates score significantly lower (*p*-value < 0.0001) on each section of the CPA exam than their male counterparts. In particular, females score on average 2.97 points lower on the BEC section. Although we do not have directional prediction on the relationship between GENDER and SCORE, the directions of the sign of the gender variable are consistent with findings of prior research [Trinkle, Scheiner, Baldwin, Krull, 2016]. Finally, the relationship between RANK\_PROGRAM and SCORE is significant (*p*-value < 0.0001) and negative across all of sections of the exam, suggesting that students from a higher-ranking school tend to perform better in the CPA exams. (Note that schools with a higher ranking are actually ranked lower numerically. For example, a school ranked #1 is ranked higher than a school ranked #2.)

## **DISCUSSION AND CONCLUSIONS**

This study examines whether the requirement of a business communication course in the curriculum results in higher performance on the CPA exam. To our knowledge, this is the first study to specifically investigate the impact of a business communication course on a professional examination. We find that candidates who attended a university where a business communication course is required scored moderately higher only on the BEC section of the exam than candidates who attended a university where such a course was not required. The reason that the requirement of a business communication course made a difference only on the BEC section might be because the BEC section is now the only section of the CPA exam where a candidate's writing ability is evaluated. This finding supports the notion that a business communication course can make a difference in student understanding about how a business communication course should be structured and presented. Accounting practitioners and academics have long proposed that improved writing skills are vital to entry-level accounting professionals. The CPA exam has incorporated writing into the exam material for over a decade because writing is viewed by the professional as a vital skill for new professionals. This study provides support for the assertion that a required business communication course can, and does, help students to develop this important skill.

Like all studies, this investigation has limitations. One limitation is that the business communication data pertains to the requirement that students take this course as part of the curriculum. It does not gather evidence of student performance in the course beyond the fact that they passed the course. It would be interesting to incorporate grade data into this study, but these data are not available. A second limitation is that a business communication course likely includes more than just written communication (e.g. public speaking and small group discussions). As a result, different universities and faculty may place more or less emphasis on the writing component of business communication. Another limitation is that the school selectivity (SAT) data are for the entering first-year

class, not the accounting students. Accounting students are perceived to have, on average, a higher entry SAT than the general student population, but universitywide data are the only data available to the researchers. A fourth limitation is that there are variables missing from the model tested. The authors would like to have had data on whether the candidates took a CPA review course, but those data were not gathered by the NASBA at the time the data were made available. On the other hand, it is highly likely that a large percentage of candidates either took a CPA review course or used some form of self-study review materials, so it is possible that a CPA review course variable would not be significant. If almost all candidates were involved in some form of exam preparation, the overall mean score on the exam would increase for all groups.

Future research into the CPA exam and candidate performance will continue to be of interest. The finding that female candidates scored lower on the CPA exam is contrary to what is generally expected. Researchers may want to investigate this issue in more detail to understand whether there are aspects of the CPA exam that drive this finding. In addition, older candidates score significantly lower than younger candidates. Researchers my want to investigate whether this finding is an issue of part-time versus full-time students. The length of time between when courses are completed and when the CPA exam is taken may be a confounding variable in this study. A third possible research area pertains to the candidates' taking of a CPA review course. Understanding the ability of CPA review companies to help candidates prepare for the exam could help graduates make a more informed economic choice.

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