Applied projects: Learning outcome differences between senior and sophomore-junior students

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ABSTRACT

In response to the current challenges to undergraduate business education, this study examines seniors, and sophomores and juniors active, or applied learning outcomes (knowledge, skills, personal development). The sample includes 143 students (51 seniors and 92 sophomores and juniors) who participated in applied course projects. The data analysis shows no significant differences between the two groups' learning outcomes. However, the causal results found different significant influences on their learning. For seniors, the self-reported mid-semester learning (primarily textbook) and team ranking (peer-evaluations) were predictors of learning outcomes. On the other hand, sophomores and juniors had two additional predictor variables – pre-test (at the beginning of the semester) and their examination scores. The implications from the study's results are discussed and specific conclusions are made to advance the understanding of applied projects and learning outcomes.

Keywords: Applied projects, undergraduate business education, career preparation

INTRODUCTION

Higher education has come under more scrutiny and greater criticism for better learning outcomes and career preparation for undergraduate (Arum and Roksa, 2011; Glenn, 2011) and graduate (Datar, Garvin, and Cullen, 2010) students. For graduate business education, new demands, e.g., complex organization and careers, provide different challenges. These demands "require MBA programs to take as broader view of their graduates' responsibilities to multiple stakeholders, and to provide their students with a deeper understanding of such phenomena as globalization, leadership, and innovation, as well as the ability to think critically, decide wisely, communicate clearly, and implement effectively" (Datar, et al., 2010, p. 1). However, greater challenges are confronted for undergraduate education. For example, "The dissatisfaction of corporate leaders in the private sector with the quality of U.S. undergraduate education has ……. already largely adapted by turning to graduate schools and foreign source of labor to fill positions that require sophisticated technical expertise, and it has often relegated U.S. college graduates to routine nonmanual occupations within the firms" (Arum and Roksa, 2011, p. 143). Employers expect undergraduate hirings to be prepared, e.g., with written communication, critical thinking, problem solving skills (Arum and Roksa, 2011).

Research has found that business majors spend less than 11 hours a week studying outside the classroom, and had the lowest gains during the first two years in writing and reasoning skills (Glenn, 2011). Furthermore, "Business students enter the work force with higher starting salaries than humanities and social science majors. By mid-career, however, some of those liberal arts majors, including political science and philosophy majors, have closed the gap" (Glenn, 2011, p. ED 16). Indications are that business skills change, e.g., in five years, while broad, general skills, e.g., communication, critical thinking, problem solving, do not (Glenn, 2011). Therefore, business schools need to revisit their curricula and adopt teaching pedagogies aiming at enhancing business students' knowledge and general skills.

As a result of the current challenges to undergraduate business education, this study examines active, or applied learning outcomes for soon to graduate students (seniors). The purpose is (1) to examine the learning outcomes of an applied real life project on undergraduate students' knowledge, skill and personal development, (2) to investigate the differences in learning outcomes of an applied project between senior and sophomore-junior students' outcomes, (3) to find the significant influences on successful seniors' applied project assignment, and (4), to compare differences in influence of a live project on sophomore and junior students. This study includes applied project literature review, methodology, results, discussion, and conclusions.

LITERATURE REVIEW

Enhancing students' learning and personal growth through integration of theory and real world applied projects has been supported by literature (Aldas, Crispo, Johnson and Price, 2010; Farazmand and Green, 2011; Titus and Petroshius, 1993; Walsh, 2002). High schools have been first to adopt applied service projects to their curricula with positive impacts on students' learning and personal growth (Butin, 2003). The real world applied project teaching method provides students with positive experiment and involvement that results in enhancing their theoretical learning and skills. In addition, by completing a real world project students

experience accomplishment, achievement and effectiveness resulting in their personal growth (Easterling and Rudell, 1997; Sternberger, Ford and Hale, 2005).

Realizing the benefits of hands on experiential teaching pedagogy, many higher education institutions have also integrated learning by doing experiential teaching method to their curricula (Aldas, Crispo, Johnson and Price, 2010). Business schools, though a little late but have also joined social sciences and liberal arts academics and adopted experiential projects to their courses (Dudderar and Stover, 2003; Geringer, Stratemeyer and Canton, 2009; Klink and Athaide, 2004; Zlotkowski 1996). Among business disciplines, marketing departments have shown more interest in incorporating applied projects to their curricula (Andrews, 2007; Klink and Athaide, 2004).

Titus and Petroshius (1993) discuss the positive impacts of an experiential project in their consumer behavior course on students' analytical skill, synthesizing theory and practice and relating marketing concepts to real world application, design and execution of a marketing project, and appreciation for marketing research. Klink and Athaide (2004) discuss the challenges of implementing service-learning into the principles of marketing course because of limited marketing backgrounds of students. However, the assessment of the students' project reports and a short questionnaire with semantic differential and open-ended questions indicated enhancement of students' perception of learning, implementation of concepts to real world problems, teamwork and communication skills, and social responsibility.

Bobbitt, Inks, Kemp and Mayo (2000) describe integration of three courses, principles of marketing, personal selling and sales management with an experiential project. The authors explain that a trade show organized and presented by the students applied to all three courses, but different classes had to develop different projects based on the trade show, such as a new business-to-business product and a marketing strategy, sales training video, and sales calls. The assessment of the integrated experiential project indicated favorable responses of the students to the project, the positive motivational impacts of class rivalry and peer pressure and a more effective teaching and learning method.

Furthermore, Walsh (2002) explains how a SUNY College at Oneonta undergraduate student Marketing Club has successfully conducted a number of major marketing research projects and consulting services for the community private and public organizations. Walsh points out that the service-learning nature of the club has provided the students with the hands on application of the textbook theories. Most of their Marketing Club projects have been presented to the community organizations as written projects resulted in enhancing students' learning objectives. Students have also acquired valuable skills such as collaborative and creative processes, consulting, teamwork and communication, in addition to personal growth and self-esteem and motivation development.

Geringer, Stratemeyer and Canton (2009) state that assessment of learning outcomes of their marketing course with a service learning project showed increase in awareness, civic responsibilities and commitment to volunteering of students. Assessment results showed enhancement of students' knowledge and understanding of the principles of marketing and leadership and communication skills. However, Geringer et al. (2009) point to relatively large standard deviation of the students learning outcomes indicating variation in the effectiveness of the service-learning pedagogy for different students.

In a comparative study, Farazmand, Green and Miller (2010) measure the learning outcomes of four marketing courses (Marketing Communications, Global Marketing, Marketing Research, Business Marketing Management) in two different semesters. The courses were taught

with a real live project in 2009 and without a real live project in the prior semester. The authors indicate that the students' average course grades were higher for the semester with the live project.

Moreover, Farazmand and Green (2011) measure and compare the impact of applied project teaching pedagogy between male and female students. The authors identify differences in teamwork and learning by gender. In another study, Green and Farazmand (2012) examine the learning outcomes of courses with live-case study projects for students who have had a prior internship experience and those who have not. They find that prior internship experience does improve applied project learning outcomes.

However, there is no research on the learning outcomes of a real life applied projects by students' educational level. Geringer et al. (2009) have suggested further research on learning outcomes of service learning project among diverse student population. This study examines differences in outcomes of active or applied project between senior and sophomore-junior students.

There is only a handful of literature on differences in students' learning by educational level. Perry (1970, 1988) evaluates college students' epistemological belief and their perceptions of factors that affect their experience during college years. Epistemology is defined as "the nature and justification of human knowledge" (Hofer and Pintrich, 1977, p. 88). Perry (1970, 1988) finds change in students' thinking process and their intellectual development as they advance through college.

Pittman (2006) examines the differences in Reasoning About Current Issues Test (RCI) scores for 110 junior and 110 senior nursing students. Pittman (2006) does not find a significant difference between RCI scores of junior and senior nursing students, instead she finds significant relationship between students' RCI score and their cumulative GPA.

Furthermore, Bailey (2007) investigates the impact of course work of industrial design school during sophomore and junior years on senior students' knowledge. The author assesses the design process knowledge of first-year students at the end of an introduction to engineering design course and senior students at the beginning of their capstone design course. He discusses that senior students' scores were not different from the first-year students' scores on design process knowledge. Bailey's (2007) results show that sophomore and junior years' classes and course work did not impact design process knowledge of senior industrial design students.

Thomas (2008) examines the intellectual development between gifted sophomore and senior mathematics and science high school students. The author examines the developmental characteristics between group differences between gender and ethnic groups of high school sophomore and senior students. Thomas (2008) finds significant developmental differences among ethnic groups at senior year, but no developmental differences at the sophomore year. The purpose of this study is to compare the impact of an applied real life project on senior and sophomore-junior students' knowledge, skill and personal development.

METHODOLOGY

The applied projects were conducted during two academic years (four semesters) in five upper-level Marketing courses at Lynn University in Boca Raton, Florida. Lynn is an independent, coeducational, residential institution with 2,109 students (1,660 undergraduate and 449 graduate) from 44 states and 78 nations. Lynn University has a 15:1 student-to-faculty ratio

and offers baccalaureate, master and doctoral degrees. The University has six colleges of which the College of Business and Management is the largest (Lynn University, 2011).

The Marketing courses included in this study are Consumer Behavior, Marketing Communications, Global Marketing, Marketing Research, and Business Marketing Management in the College of Business and Management. Each course was structured exactly the same with the exception of the type of marketing project. Generally, class sessions met on Tuesdays and Thursdays for 75 minutes. Depending on the semester, examinations were 30% of the course grade, course project ranged from 30% to 50%, and other assignments 20% to 40%. The courses allocated time of approximately 60% classroom meetings and 40% field research and project development.

For over ten years the College of Business and Management (CBM) has had a relationship with SCORE, a partner of the U.S. Small Business Administration, to provide "real world" learning opportunities for CBM students. Prior to each semester, the course instructor worked with a SCORE Counselor to develop a course project. During the semester, the same Counselor would be a co-instructor for the courses and in the classroom between 40% and 50% of the class sessions, but primarily during the student teams' project development period. However, the businessperson also would be in class the first week of the semester and a few sessions during the textbook learning period to discuss pre-project topics and answer any questions about the project. During this four-semester period, the same Score Counselor, a highly successful businessperson in manufacturing, provided the business project for and worked with 143 traditional undergraduate students.

Semesters were in two parts – textbook (assignments and examinations) and project (field research and presentations) – but were integrated with knowledge content and skills development. The first part of the semester was focused on textbook assignments while the second part was only for developing the applied learning project. For example, the textbook chapter assignments included instructor-developed discussion questions that linked the text to the project. Furthermore, each course had instructor-developed project guidelines in which textbook concepts were to be applied to the project. During the project development period, there were no class sessions for one day of the week. The teams used the classroom for meetings with the instructor and/or members. Business (project) meetings were held with the businessperson and the instructor during the second scheduled class day each week. These meetings were to report (project status) and for informational (ask questions) purposes.

Each team made an oral presentation using PowerPoints and submitted a 30 to 40 page written plan to the instructor and businessperson during the last week of the semester. At the time of the written submission, each team individually rated or evaluated (based on a total of 100%) all team members as to their contribution to the project with no two members having the same rating (percentage). The projects were evaluated (graded) and returned to students during the scheduled Final Week class session. This provided an opportunity for students to ask questions and to make comments for timely feedback.

This study includes 143 students who participated in the applied projects during the four semesters. There were 51 senior level students (with 90 or more credits) and 92 sophomore and junior students (with 30 to 89 credits). There were 80 males and 63 females. The vast majority was College of Business and Management students (95.1%), and only six students were from the College of International Communications (4.2%) and one for the College of Liberal Studies (0.7%). While there was a large representation of international students (37.8%), U.S. students

were the majority (62.2%). More than two-thirds of the students lived off-campus (67.8%) and the remaining students lived on-campus (32.2%). Most students (58.0%) had not taken a required

Table 1   Students' Characteristics: Seniors and Sophomores-Juniors

Student Characteristics	Senior Year Students		Sophomore and Junior Year Students		Total Students	
	Number	Percent	Number	Percent	Number	Percent
Total	51	35.7	92	64.3	143	100.0
Gender						
Male	28	54.9	52	56.5	80	55.9
Female	23	45.1	40	43.5	63	44.1
Academic Major						
College of Business & Mgt.	47	92.2	89	96.7	136	95.1
College of Int'l. Comm.	4	7.8	2	2.2	6	4.2
College of Liberal Studies			1	1.1	1	0.7
Citizenship						
U.S.	27	52.9	62	67.4	89	62.2
Not U.S.	24	47.1	30	32.6	54	37.8
Residence						
On-Campus	16	31.4	30	32.6	46	32.2
Off-Campus	35	68.6	62	67.4	97	67.8
University Internship						
Yes	32	62.7	28	30.4	60	42.0
No	19	37.3	64	69.6	83	58.0
University Organizations						
None	31	60.8	46	50.0	77	53.8
One	10	19.6	27	29.3	37	25.9
Two	9	17.6	10	10.9	19	13.3
Three	1	2.0	2	2.2	3	2.1
Four of More			7	7.6	7	4.9
Summer Employment (weekly)						
No Paying Job	29	56.8	32	34.8	61	42.6
Job Less than 10 Hours	1	2.0	7	7.6	8	5.6
Job 10 to 19 Hours	4	7.8	9	9.8	13	9.1
Job 20 to 29 Hours	6	11.8	14	15.2	20	14.0
Job 30 or More Hours	11	21.6	30	32.6	41	28.7
Semester Employment (weekly)						
No Paying Job	35	68.6	70	76.1	105	73.4
Job Less than 10 Hours	6	11.8	6	6.5	12	8.4
Job 10 to 19 Hours	5	9.8	10	10.9	15	10.5
Job 20 to 29 Hours	3	5.9	5	5.4	8	5.6
Job 30 or More Hours	2	3.9	1	1.1	3	2.1

internship course. About one-half of the students (53.8%) did not belong or were associated with a University organization, e.g., student government, fraternity/sorority, athletic team. About four out of ten students did not have a paying Summer job (42.6%) but most of those who did worked 30 or more hours (28.7%). During the semester of the course, most students did not work (73.4%) but most of those who did worked less than 20 hours (18.9%). See Table 1 for specific senior and sophomore-junior group characteristic details.

Students were given three surveys during each semester. First was a pre-project survey (pre-test) at the beginning of the semester. The students provided self-reported demographic information (e.g., gender, citizenship), campus experiences (e.g., student activities), educational

Table 2   Project Score Comparisons: Seniors and Sophomores-Juniors

Panel A: Student-Reported (Post-test)			
Items	Senior Year Students Mean	Sophomore-Junior Year Students Mean	Mean Difference
Learned more about Marketing in this course than a Marketing course without a service (applied) learning project. (*Knowledge*)	1.73	1.71	0.02**
Developed better or new skills in this course than a Marketing course without a service (applied) learning project. (*Skills*)	1.76	1.76	0.00**
Look forward to doing another service (applied) learning course project in the future. (*Personal Development*)	1.92	2.21	-0.29
Look forward to working in a team in the future. (*Skills*)	2.14	2.36	-0.22
Did better in this course that had <u>both</u> examinations and a service (applied) learning course project than without such as project. (*Knowledge and Skills*)	1.90	2.15	-0.25
A service (applied) learning project has benefited me more in meeting my career goals than a course without such a project. (*Knowledge and Skills*)	1.80	1.88	-0.08**
Mean Score for the 6 student-reported items	1.89	2.02	-0.13

Panel B: Instructor-Reported			
Item	Senior Year Students Mean	Sophomore-Junior Year Students Mean	Mean Difference
Project grade	2.31	2.00	0.31

Note: * indicates significant differences ($p < 0.05$) and ** shows similarities ($p > 0.70$).

experiences (e.g., credits earned, internship completion), and their perception of examinations and applied projects with six 5-point Likert-type scale items. Second was a mid-project survey (mid-term test). This survey was completed after the textbook assignments and before beginning the project in which the six items (5-point Likert scale) was asked again. Third was a post-project survey (post-test) at the end of the semester. The six items were asked again but the verb tense was changed from future tense to past tense. See Table 2, Panel A for the six post-test items. As shown in the table, these items were researchers' developed and measures students' applied project perceptions and experiences as (1) knowledge, (2) skills, (3) personal development, or (4) both knowledge and skills. Additional data were included as to the teams' ranking of each member with no two students in the team having the same ranking and was used to compute the student's applied project score. Furthermore, other data provided for the study were from the instructor or the University, e.g., examination and applied project scores, cumulative grade point average.

RESULTS

The purpose of this study is to examine the differences between and the relationship of advanced undergraduate students (seniors) and those with less college experience (sophomores and juniors) as related to applied learning project learning outcomes. The data were analyzed and

Table 3   Bivariate Correlations for Regression Equations

Variables	Gender	Citizen	Exam Scores	Pre-Proj. Test	Mid-Proj. Test	Team Rank
Gender	1.000					
Citizen	-.110	1.000				
Exam Scores	-.333*	-.144	1.000			
Pre-Project Test	-.003	-.108	.080	1.000		
Mid-Project Test	-.027	-.041	.014	.596*	1.000	
Team Ranking	-.206**	-.070	.383*	.015	-.077	1.000

Note: * and ** indicate significances of < 0.01 and < 0.05 (differences) levels, respectively.

the results are reported by two methods. First is a comparison between students who were seniors (n = 51) and those who were not seniors, or sophomores and juniors (n = 92) using t-Tests. Second determines what factors (variables) influence learning outcomes of all students, seniors, and sophomores-juniors using multiple regression. Learning outcomes (dependent variable) are determined by three measures – the students, the instructor and the students-instructor. The students perform a peer-performance evaluation for each team member, and the instructor evaluates, or grades the course project. Then, the students' peer evaluations and the instructor's project evaluations are combined and used to determine each student's applied project grade.

The post-project survey (post-test) is used to determine the students' learning outcomes. Students completed a six-item questionnaire that was measured by a 5-point scale (1 = strongly agree to 5 = strongly disagree). No item showed significant differences ($p < 0.05$) between the two groups. Three of the items measuring knowledge, skills, and knowledge and skills indicated similarities ($p > 0.70$) between senior and sophomore-junior students. While not significant, seniors had lower mean scores for three items (personal development, skills, and knowledge and skills) and total mean scores (unweighted for the six items). See Table 2, Panel A. To further examine the comparison between the two groups, an analysis of the project scores (1 = A to F = 5) was completed. The results was no significant differences but the sophomore-junior group performed slightly better (higher grade). See Table 2, Panel B.

A bivariate analysis (Pearson) was performed to examine correlations and two-independent variable relationships. The results ranged from .003 to .596. See Table 3. Gender (1 = male, 2 = female) and citizen (1 = U.S., 2 = international) were inversely related to all select variables. Gender and examination scores (1 = A to 5 = F) and gender and team ranking (1 = highest to 3 = lowest) were significant at 0.01 and 0.05, respectively. The only other inverse relationship was team ranking and mid-project survey (1 = strongly agree to 5 = strongly disagree). Only two positive relationships were significant ($p < 0.01$) – team ranking and examination scores, and pre-project and mid-project surveys.

To determine the relationship of the independent variables and the dependent variable of total project score (unweighted mean score of post-project survey and project grade), multiple regression (forward stepwise) was performed for all students, seniors, and sophomore-juniors. The independent variable was included in the equation only if it was significant at or less than 0.05. For all students, the explained variance (adjusted R^2) was 25.5%. Four independent variables were included in the equation. Mid-project response and team ranking have positive

relationships to total project score. However, U.S. citizen and gender have negative relationships. See Table 4, Panel A.

Table 4 **Multiple Regression Equations for Course Projects for All, Senior, and Sophomore-Junior Students**

Panel A: All Students

R^2 = .276	Adjusted R^2 = .255	Std. Error = .62544	F = 13.145		Significant F = .000
Variable	Regression Coefficient	Standard Error	Standardized Coefficient	T	Significant T
(Constant)	1.462	.376			
Mid-Proj. Test	.402	.089	.330	4.531	.000
Team Ranking	.323	.088	.275	3.679	.000
Citizen	-.302	.109	-.203	-2.766	.006
Gender	-.272	.109	-.187	-2.502	.014

Panel B: Senior Year Students

R^2 = .178	Adjusted R^2 = .144	Std. Error = .67689	F = 5.193		Significant F = .009
Variable	Regression Coefficient	Standard Error	Standardized Coefficient	T	Significant T
(Constant)	.526	.501			
Mid-Proj. Test	.454	.171	.351	2.652	.011
Team Ranking	.384	.175	.290	2.193	.033

Panel C: Sophomore-Junior Year Students

R^2 = .311	Adjusted R^2 = .279	Std. Error = .612363	F = 9.800		Significant F = .000
Variable	Regression Coefficient	Standard Error	Standardized Coefficient	T	Significant T
(Constant)	-.115	.399			
Pre-Proj. Test	.286	.182	.168	1.572	.002
Team Ranking	.298	.107	.265	2.779	.007
Exam Scores	.053	.023	.219	2.291	.024
Mid-Proj. Test	.275	.124	.233	2.218	.029

For senior year students, the explained variance (adjusted R^2) was 14.4%. Two independent variables were included in the equation. Mid-project response and team ranking have direct relationships to total project score. See Table 4, Panel B. For sophomore and junior year students, the explained variance (adjusted R^2) was 27.9%. Four independent variables were included in the equation. Pre-project and mid-project responses, team ranking, and examination scores have positive relationships to total project score. See Table 4, Panel C. Therefore, mid-project response and team ranking were major factors (variables) in predicting applied projects success by which they were included in all three equations.

DISCUSSION

As seniors experience their final year of undergraduate education, they should be demonstrating higher levels of learning, e.g., better understanding of course content, and more advanced skills development, e.g., interpersonal communications, to prepare for entry-level career positions. At the same time, younger students (sophomores and juniors) may not have advanced to the learning and skills development as the more experienced students (seniors). Hence, there is a need for a better understanding of these situations in preparing students for successful careers.

In comparing the two groups (seniors, and sophomores and juniors), three measures (knowledge, skills, and knowledge, skills) were analyzed. No measure showed significant differences ($p < 0.05$) between the two groups. However, the results indicated similarities ($p > 0.70$) between the two groups is similar to the Pittman's (2006) and Bailey's (2007) results. Pittman examines the differences in Reasoning About Current Issues Test (RCI) scores for 110 junior and 110 senior nursing students and her findings did not show a significant difference between RCI scores of junior and senior nursing students. Bailey (2007) investigates the impact of course work of industrial design school during sophomore and junior years on senior students' knowledge. He found that senior students' scores were not different from the first-year students' scores on design process knowledge. Bailey's (2007) results show that sophomore and junior years' classes and course work did not impact design process knowledge of senior industrial design students.

Applied course projects provide learning, skills and personal development opportunities. For example, with practical projects abstract learning, e.g., textbook theories and concepts, are applied to "real world" experiences, e.g., solving business problems, identifying business opportunities. However, knowledge, e.g., textbook learning, proceeds skills development, e.g., critical thinking (Willingham, 2009). The results in this study found that examination scores (test grades) were course project success predictors for younger, less experienced students (sophomores and juniors). These results are similar to Pittman (2006) result in which she found significant relationship between students' RCI score and their cumulative GPA. Furthermore, these younger students' perceptions of applied course projects at the beginning (pre-project) and during the middle (mid-project) of the semester were important to learning outcomes. The more favorable response to these surveys, e.g., strongly agree, agree, the greater the likelihood of their project learning success. In addition, team ranking (peer-evaluations) was a significant influence. Therefore, the pre- and mid-project survey responses and team ranking indicates the younger students (sophomores and juniors) were engaged and active in their learning, and a commitment to learning content (textbook examinations).

On the other hand, seniors' applied course project success was influenced by two factors. First was the mid-project survey response, as it was for the less experienced students. Since this survey was at the end of the textbook (discussion questions and examinations) and project planning (how the text relates and will be applied to the project) part of the semester, students who realize the value of the active learning experience during the first part of the semester were successful in the last part (field research and project development). A contributing influence on this could result from the emphasis placed on the project during the first part of the semester, e.g., persuading and encouraging the students, project related discussion questions by the instructor. Second factor influencing the senior students' project success was the team ranking, as it was for the sophomore and junior students. Basically, students who were committed to a

successful project, e.g., as a leader, doing additional work/greater effort, were rewarded in their team's peer evaluation. This too provides a "real world" learning experience with applied projects.

The findings in this study for all students (the sample) found that four factors were significant to their project success. Two were also influences for both groups – mid-project survey responses and team ranking. However, two different factors were influences for all students. International and females students were likely more successful in their course projects than United States and male students. This could have been a result of being minorities, e.g., fewer international and female students. Therefore, these students might have been more committed and provided greater effort to learn and be more successful.

CONCLUSIONS

The purpose of this study was to examine the differences between senior and sophomore-junior students and the influences on their applied projects learning outcomes. While there were no significant differences between the two groups, there were additional factors that were important for younger, less experienced students (sophomores and juniors). For their applied project success, the emphasis on and the value of such a learning experience must be continued throughout the semester, as indicated by the pre- and mid-project survey responses. Furthermore, this group's textbook learning is significant to their project's success.

This study has advanced a better understanding of applied projects learning outcomes. However, there are limitations to its findings. The study was cross-sectional and in one department and academic unit at one university. Future studies should have a longitudinal design to analyze students' applied learning outcomes as a sophomore, then as a junior, and finally as a senior. A study of other business courses (other than marketing) or other academic units (other than business), and at different universities could further advance knowledge of applied projects learning outcomes.

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