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STUDENT ATTITUDES AND PERCEPTIONS OF JUSTICE TOWARD SPECIFICATION GRADING IN AN UNDERGRADUATE MANAGEMENT COURSE

Juanita Woods, University of North Georgia

ABSTRACT

This study explores the effectiveness of specification grading, an approach to grading that incorporates specific requirements and detailed feedback on student performance with a focus on student mastery of content, in two undergraduate management courses taught by the author. The study found that specification grading effectively distinguishes between students based on their level of mastery, with positive correlations between final grades and exam averages. Students perceived specification grading as fairer than traditional grading in terms of procedural, informational, and interpersonal justice, but not distributive justice. They also saw it as a relevant proxy for workplace performance evaluations. However, student attitudes toward the grading approach were varied. Some appreciate the sense of control, clear guidelines, and rewards for participation and effort. However, others found it confusing, time-consuming, and demotivating, with concerns about the lack of middle ground and excessive workload. The results of this study may help other academics create specification grading approaches for their courses that minimize negative student attitudes and increase student autonomy and mastery of the course material.

INTRODUCTION

For academics in higher education, grading might be the one activity we enjoy the least. Still, student grades are the de facto method of evaluating students to allow them to progress through degree completion. Academic evaluations include assessments of student performance through summative evaluations of obtained knowledge, resulting in grades tied permanently to the student record based on expert judgment (Schlemer & Vanasupa, 2016). Students' familiarity with this "percentage of perfection" grading has trained them to align their effort with achieving some level of quality, such as A, B, or C. However, once students graduate from college and enter the workforce, the approach to evaluating their performance changes. Employees are assessed based on satisfactory performance of job duties and knowledge of their job using performance assessments or evaluations (Thuy & Trinh, 2020). Feedback is provided to employees to enable them to improve their performance over time. Thus, applying a grading approach within the classroom that mimics workplace performance appraisal systems will better prepare students for their future careers.

The current study evaluates one instance of applying specification grading, a grading approach incorporating specified requirements and detailed feedback on student performance to

allow students to improve their performance on specific assignments. Research has shown that specification grading is a valuable tool for providing actionable and timely feedback to students, allowing them to quickly reflect and modify their skills (Carlisle, 2020).

This paper explores the effectiveness of specification grading in a management course by answering three guiding questions. First, does specification grading sufficiently distinguish students who have attained the minimum required level of knowledge from students who have mastered the content? Second, what are student perceptions of specification grading as an equitable assessment of performance and an appropriate preparation for workplace performance evaluations? Finally, what are student attitudes about their experience in a specification-graded course? Examining data from two undergraduate courses designed around mastery grading will answer these questions and assist other instructors in incorporating specification or mastery grading into their course design.

SPECIFICATION GRADING

Specification grading, also known as mastery grading, is an alternative to the teacher-driven, summative approaches to traditional grading, where grades are often based on a complicated rubric or intuitive assignment of "percentage of perfect" grades that indicate student proficiency in completing an assignment (Nilson, 2015). In traditionally graded courses, students often perform to the minimum requirements, not fully comprehending the material but earning enough to "make the grade" (Nilson, 2015). Instructors using this approach are burdened with providing unbiased and consistent feedback that takes time and mental effort.

Specification-based assignments can be structured in many ways, such as a design where students earn points for completed work or where students must complete a bundle of work to earn a particular grade (e.g., A, B, C). Regardless of the structure, students earn points or credit for completed work by sufficiently meeting assignment requirements. Assignment requirements are declarative sentences, such as "the author must include at least one valid and appropriate reference other than the textbook to support recommendations." For example, in a project management class, an assignment to produce a project charter might require appropriate content, a correct format, and submission quality (e.g., grammar and spelling). Specification-based assignments are similar to assessments using task-based rubrics, where task-specific criteria and performance statements are arranged in a matrix to denote the quality of a student's response (Atkinson & Lim, 2013). The difference between specification-based assignments and task-based rubrics is that in the former, students are given a list of "exemplar" statements that describe what an optimal student submission should contain. Task-based rubrics may include the optimal statements but also include statements that describe varying levels of quality, making the process of developing rubrics time-intensive and subjective.

One caveat to the success of specification grading is that both the assignment and grade requirements are clear and unambiguous (Nilson, 2015). Proponents of specification grading suggest that this grading methodology motivates students to do their best rather than to perform at the minimum acceptable standards (Elkins, 2016). Students become active participants in their learning and appear more motivated to submit quality work.

Specification grading has been applied at the undergraduate and graduate levels and in diverse areas such as communication (Elkins, 2016), political science (Blackstone & Oldmixon, 2018), mathematics (Carlisle, 2020), dietetics (Pope et al., 2020), public affairs (Jones, 2020), and education (Prasad, 2020). Approaches to implementing specification grading are similar, but unique features distinguish how instructors organize and evaluate assignments. Some instructors started with assignments grouped by difficulty level (Blackstone & Oldmixon, 2018), while others bundled assignments based on the level of effort required (Elkins, 2016; Pope et al., 2020). Other instructors created assignment bundles based on a combination of effort and minimum student performance (Carlisle, 2020; Jones, 2020; Prasad, 2020) or solely on student performance (Schlemer & Vanasupa, 2016).

There were also various approaches to allowing students to revise submitted work that did not meet the assignment requirements. Most instructors allow for one or more revisions to be submitted by students (Elkins, 2016; Jones, 2020; Pope et al., 2020; Prasad, 2020; Schlemer & Vanasupa, 2016). Some instructors introduced a token system, where students could exchange a token for a chance to revise a submission or submit work late (Blackstone & Oldmixon, 2018; Carlisle, 2020).

In these studies, the instructors also evaluated student attitudes and performance as indicators of the validity of specification grading as a practical and appropriate method of evaluating student performance. The following sections will explore student performance and attitudes as a basis for evaluating the success of one implementation of specification grading in an undergraduate management course.

Specification Grading and Student Performance

The first question we must consider as educators is if specification grading sufficiently distinguishes students who have mastered the minimum required level of knowledge from students who have mastered more advanced concepts. The primary purpose of teaching students is to help them master a subject. Specification grading is designed around mastery, and most implementations allow students to master content by submitting multiple attempts of an assignment or quiz (Elkins, 2016; Jones, 2020; Pope et al., 2020).

After implementing specification grading, Blackstone and Oldmixon (2018) found no difference in the average or distribution of course grades between point- and specification-based grading systems. However, Carlisle (2020) noted that the specification-based grading system improved student performance. Numerous variables may affect the difference in grading, such as the content of the course (social science (Blackstone & Oldmixon, 2018) versus mathematics (Carlisle, 2020) or the number of opportunities allowed for revision of submitted work. Being able to revise submitted work that did not meet the assignment requirements may give students who struggled early in the course a second chance that they might not have been given in a traditionally graded course (Carlisle, 2020).

Thus, a well-designed specification-based grading system should balance the opportunities for students to master the content with the level of effort required to earn higher grades (Carlisle, 2020). Further, the grading scheme should not reduce or negate the expected

correlation between exam grades and final grades. It is preferred that students receive grades commensurate with the amount of learning achieved and the effort required, which leads to the first hypothesis.

Hypothesis 1: Student final grades correlate positively and significantly with student exam averages.

Specification Grading and Perceptions of Equity

An essential aspect of well-designed grading systems is the ability to be applied fairly for all students. Students have perceived specification grading as helpful to their success and reduced feelings of stress about the course (Pope et al., 2020). Researchers have also noted that students felt the grading approach was fairer than other forms of grading (Jones, 2020). In the study by Pope et al. (2020), students appreciated the transparency of the grading process, which led to a sense of trust in the fairness of the grading approach.

The link between trust and perceptions of fairness has been conceptualized in the management literature as organizational justice (Table 1; Colquitt, 2001). Organizational justice is the overarching term for notions of fairness in how organizational procedures are applied (procedural justice), how outcomes or rewards are distributed (distributive justice), how organizational leaders treat employees (interpersonal justice), and how information is shared (informational justice) (Colquitt, 2001). The dimensions of justice have demonstrated positive effects on task performance in the workplace (Colquitt et al., 2013) and satisfaction with performance appraisals (Saraih et al., 2018), so it is a small step to consider that this relationship may also hold in academic settings.

Table 1
ORGANIZATIONAL JUSTICE DIMENSIONS

Dimension	Definition	Examples
Organizational Justice	Perceptions of how policies, procedures, incentives, relationships, and information are fairly shared or applied within an organization (Castillo & Fernandez, 2017; Colquitt, 2001; Colquitt et al., 2013)	
Procedural Justice	Fairness perceptions of the application of policies and systems for decision-making (Castillo & Fernandez, 2017; Colquitt, 2001; Unterhitzenberger & Bryde, 2019)	Performance Appraisal Policies, Grading Guidelines
Distributive Justice	Fairness perceptions of the distribution of resources and outcomes (Colquitt, 2001; Kovacevic et al., 2013)	Pay, bonuses, promotion, recognition, grades
Interpersonal Justice	Fairness perceptions of how people are treated and respected (Colquitt et al., 2013; Kovacevic et al., 2013; Saraih et al., 2018)	Relationship quality between supervisor and subordinates or instructor and student
Informational Justice	Fairness perceptions of how information is shared and communicated (Colquitt, 2001; Kovacevic et al., 2013; Unterhitzenberger & Bryde, 2019)	Feedback quality and transparency of evaluation and decision-making process

Organizational justice and its relationships with student achievement (performance) and satisfaction have been studied in academic settings, with various results. Kovacevic et al. (2013) found that procedural justice was positively correlated with first-year college student achievement but not with other forms of justice. Castillo and Fernandez (2017) observed that a positive relationship existed between distributive, informational, and interpersonal justice with student satisfaction but not procedural justice.

Best practices in specification grading advise that the evaluation method should be transparent, reduce faculty-student conflict, increase students' feelings of situational control, and communicate high academic standards (Nilson, 2015). Because specification grading is designed to be transparent regarding how grades are evaluated, this assessment method should strengthen students' positive perceptions of informational justice. Specification grading should improve student perceptions of interpersonal justice by reducing conflict between students and instructors. Specification grading should further increase student perceptions of distributive justice by giving them autonomy through consciously selecting a target grade to achieve. Finally, because specification grading is designed to communicate high academic standards, this assessment approach should improve student perceptions of procedural justice.

Hypothesis 2: Students perceive that specification-based grading provides a more equitable approach to evaluating student performance than traditional grading approaches in terms of a) procedural justice, b) information justice, c) interpersonal justice, and d) distributive justice.

Specification Grading as Proxy for Workplace Performance Evaluations

A final evaluation of specification grading relates to the primary purpose of business and management education programs, which is to prepare students to enter the workforce upon graduation. One way to prepare students is to provide them with knowledge and experience about how their performance will be evaluated in the workplace. Academic evaluations include assessments of student performance through summative evaluations of obtained knowledge, resulting in grades tied permanently to the student record. However, in the workplace, performance evaluations include proof of job-related knowledge and an evaluation of how well the employee works within the job context (Murphy, 2020; Murphy et al., 2018). Letter grades are not typically given in workplace settings, and most employers allow employees to redo sub-par work.

In workplace performance appraisal systems, performance standards (learning outcomes) are defined, individual performance goals (target grades) are identified, and detailed feedback is usually provided with improvement plans to enable mastery of one's job (Murphy, 2020; Murphy et al., 2018; Nilson, 2015). In both systems, feedback mechanisms and improvement plans are included in the evaluation process (Murphy, 2020; Murphy et al., 2018; Nilson, 2015).

Specification grading is similar to workplace evaluations in that it allows students to redo unsatisfactory work and gives them control over their effort and performance (Jones, 2020).

Thus, students are expected to perceive specification grading as an appropriate proxy for workplace evaluations.

Hypothesis 3: Students familiar with workplace performance evaluations perceive that specification-based grading is similar to how performance is evaluated in the workplace.

Example Course Design

The course evaluated here is a required course for all BBA Management students. The course is designed with a management focus and aligns with the college's mission of preparing students to become innovative and ethical business and technology professionals. Learning objectives are defined at the department level, and all sections taught must satisfy the stated course learning objectives. The learning objectives represent the minimum level of knowledge expected to be acquired by students.

There have been several iterations of the grading approach to this class, continuously improving over four semesters. The initial deployment led to mixed results and the realization that students needed to be taught how to work with specification grading since they were used to percentage-based grading. During the second and third iterations, an effort was made to clarify the distinction between effort and performance for each target grade. Early iterations did not adequately distinguish between higher grades and did not include how D and F were assessed.

The final iteration, presented in Table 2, addresses the limitations of the earlier iterations. A clear delineation between effort and performance for each grade level (A, B, C) was achieved. Since BBA management majors must also earn a C or better in the course to earn credit toward their degree, a grade of "C" represents the minimum knowledge and performance expected for all students. Students who do not meet the minimum requirements for a C are assessed at the D or F level based on their participation, exam average, and assignments submitted. The distinction between the grade levels relates to the effort and mastery required to achieve each grade level, where the average exam and quiz score assesses mastery, and effort is assessed by the quantity and type of work completed that meet the stated requirements.

Table 2
EXAMPLE GRADE REQUIREMENTS

For a "C," you must satisfactorily complete the following activities.

- Earn "MET" on the Career Skills Assessment.
- Earn a 70% average or greater average on all exams and quizzes.
- Earn "MET" on 70% of the learning modules.

For a "B," you must satisfactorily complete the following activities.

- Earn "MET" on the Career Skills Assessment.
- Earn a 70% average or greater average on all exams and quizzes.
- Earn "MET" on 70% of the learning modules.
- Earn "MET" on 3 of 4 Case Analysis assignments.

For an "A," you must satisfactorily complete the following activities.

- Earn "MET" on the Career Skills Assessment.
- Earn an 85% average or greater average on all exams and quizzes.
- Earn "MET" on 85% of the learning modules.
- Earn "MET" on 3 of 4 Case Analysis assignments.

Grades of "D" or "F" will be given to students who do not meet the minimum requirements for a C and will be determined based on a combination of content mastery and student effort.

Other than exams and quizzes, all assignments are scored as "MET" or "NOT MET" based on whether students meet the assignment's requirements. Every assignment includes a list of requirements that must be met for full credit. Students are encouraged to use these as checklists to ensure their submission meets all requirements. After the first submission, students can submit a revision within two weeks of the posted feedback based on instructor feedback for work that initially does not meet requirements.

Assignments focus on topics relevant to the class and require students to research current management trends, suggest a solution to a problem, or analyze a typical management scenario and make recommendations. Assignments are expected to take students 1-2 hours to complete. Student submissions are evaluated against a list of requirements. An example of assignment requirements is listed in Table 3.

Table 3
EXAMPLE ASSIGNMENT REQUIREMENTS FOR "MET"

A "MET" score requires the following to be satisfied by the student's submission.

- FORMAT: The document shall be formatted appropriately:
  - Single-spaced, 12-point font (any professional style), and 1-inch margins.
  - Word document or format that is compatible with Word.
  - Use the headings that are provided in the instructions to organize your response (e.g., "1. Key Issues"). **Do not include question text.**
- RESPONSES: Responses must sufficiently address the questions in the assignment (at the instructor's discretion).
- SOURCES: The submission must include at least one valid and appropriate reference in addition to the case and textbook.
  - In-text citations must be included as appropriate, and associated references shall be formatted correctly in a "Works Cited" list at the end of the document.
  - Please visit the University Library online guides for assistance formatting citations and references (link redacted).
  - Turnitin Similarity Rating must be less than 15%, excluding the works cited.
- QUALITY: The submission shall be free of grammar, spelling, and other writing errors.
- WORD COUNT: The body of the submission must be at least 750 words.
  - This excludes the list of references to be included at the end of the document.

METHOD

Research Design

Three surveys were delivered to students' university email accounts using Qualtrics™. The first survey was delivered in week 2 after course enrollment was finalized. The first survey asked questions about respondent demographics, the student's target grade for the class, open-ended questions about their experience with specification grading, their level of understanding about how grades would be calculated in the class, and several questions evaluating the student's general self-efficacy and perceptions of equity in grading processes in college. Descriptions of the measures used to evaluate these concepts are discussed below.

A second survey was delivered during week 8, the semester's mid-point. At this point in the semester, students usually understand the approach to grading and are well-positioned to earn at least a C for the class. In the second survey, students were asked open-ended questions about their rating of specification grading as a compelling motivation for learning the course material, their likes and dislikes of specification grading, and their understanding of how grades are assigned in the course. Students were also asked about their familiarity with workplace performance evaluation systems and how well specification grading prepared them for the same.

A final survey was delivered during the last week of the semester. In this survey, students were asked to evaluate the perceived justice (procedural and distributive) of the course grading approach and the perceived interpersonal and informational justice demonstrated by the instructor. At this point, students knew what their course grade would be.

Quantitative Data

General Self-efficacy. Student general self-efficacy was evaluated using a measure developed by Chen et al. (2016). Example questions include, "When facing difficult tasks, I am certain that I will accomplish them" and "I will be able to overcome many challenges successfully" (Chen et al., 2016). Reliability for the eight-item measure was high ($\alpha = 0.89$, n=8).

Justice Perceptions. Both measures of justice (regarding the general grading approaches and the specification grading approach) were evaluated using an adapted version (Colquitt, 2001). For the general perceptions of grading justice, prompts directed the students to think about their experience with the various grading approaches and instructors they have had. For the specific perceptions of grading justice (specification grading), students were asked to think about their experience with the grading method of the current course and their current instructor. They answered twenty questions relating to the underlying constructs. Procedural justice included seven statements (e.g., "In general/in this course, to what extent have you had influence over the grading approach used to determine your course grade?"). Distributive Justice was measured with four items (e.g., "In general/in this course, to what extent does your grade reflect the effort you have put into your work?"), as was interpersonal justice (e.g., "In general/in this course, to what extent has your instructor treated you with dignity?"). Informational justice was measured with five items (e.g., "In general/in this course, to what extent has your instructor communicated feedback in a timely manner?"). Reliability estimates and pairwise correlations for these measures are listed in Table 4.

Table 4
MEASURE RELIABILITY AND PAIRWISE CORRELATIONS BETWEEN VARIABLES

	1	2	3	4	5	6	7	8	9
1. GENSEFF	(0.89)								
2. GENPROJ	0.064	(0.76)							
3. GENDISJ	0.104	.414*	0.92						
4. GENPERJ	-0.004	.352*	.591*	(0.89)					
5. GENINFJ	-0.030	.528*	.622*	.544*	(0.82)				
6. INSPROJ	-0.143	0.070	0.038	0.200	0.076	(0.83)			
7. INSDISJ	-0.070	-0.080	-0.090	0.219	-0.116	.506*	(0.93)		
8. INSPERJ	-0.107	-0.221	0.069	0.196	0.048	0.227	.450*	(0.95)	
9. INSINFJ	0.022	-0.124	-0.085	0.059	0.004	0.285	.512*	.457*	(0.82)

Note1: Reliability Estimates are on the diagonal; Valid Cases = 55.
Note2: GENSEFF = Student General Self-efficacy; GENPROJ = General Procedural Justice; GENDISJ = General Distributive Justice; GENPERJ = General Interpersonal Justice; GENINFJ = General Information Justice; INSPROJ = Course-Specific Procedural Justice; INSDISJ = Course-Specific Distributive Justice; INSPERJ = Course-Specific Interpersonal Justice; INSINFJ = Course-Specific Information Justice.
Note3: * Correlation is significant at the 0.01 level (2-tailed)

Qualitative Data

Open-ended questions were included in Surveys 2 and 3 (see Table 5), and student responses were analyzed using a combination of sentiment analysis and content analysis. Student attitudes toward specification grading were analyzed using NVivo 12 Pro sentiment analysis, a scoring model for positive, negative, and neutral tones (*NVivo 12 Plus*, 2018). Statements were scored for sentiment by paragraph (entire response). Although the open-ended questions were not required, most students responded sufficiently.

Table 5
OPEN-ENDED QUESTIONS FOR QUALITATIVE ANALYSIS

Survey	Guiding Questions
2 (Mid-semester)	1. What do you like or not like about the approach to grading in this course? Please explain with specifics. 2. Briefly describe your understanding of how to get the grade you want in this course. 3. In your own words, describe how your performance is or might be evaluated at work.
3 (End of Semester)	1. What was the most important thing you did to achieve the grade you wanted in this course? 2. What did you like or not like about the approach to grading in this course? Please provide specific examples. 3. How did the grading of this course impact your learning of the course content? 4. Now that you have experienced this style of grading, would you like to see other instructors use it? Why or why not?

Research Participants

Research participants include a convenience sample of undergraduate students enrolled in sections taught by the author during one semester. Students were awarded extra credit for each survey they completed. Students could opt out of survey participation at any time with no penalty, and students had the option to earn extra credit for an alternate set of activities to ensure students did not feel pressured to participate. Of the 55 students invited to participate, 28 completed all three surveys (51% response rate). 43% took the course face-to-face, while the remaining (57%) took the same course online. Students were young adults (age 18-24 = 79%) and worked at least part-time (work part or full-time = 68%, full-time student = 32%). The genders were equally represented (male = 50%; female = 50%). Respondents were juniors (11%) and seniors (89%) taking upper-division undergraduate coursework.

RESULTS

Hypothesis Tests

The first hypothesis proposed that specification grading sufficiently distinguishes students who have mastered the minimum required level of knowledge from students who have

mastered more advanced concepts. The hypothesis was evaluated by comparing the student exam average and the course final grade. Results demonstrate a positive and significant correlation between student final course grades and the exam average (Table 6). Thus, hypothesis 1 is supported, and the grading approach did not disrupt the expected positive and significant relationship between exam averages and the final course grade.

Table 6
SUMMARIZED RESULTS FOR HYPOTHESIS 1 GRADING ACCURACY

Variable	Mean (S.D.)	1
1. Final Course Grade	0.81 (0.10)	-
2. Exam Average	0.79 (0.15)	0.563**
** Correlation is significant at the 0.01 level (2-tailed)		

The second hypothesis evaluated perceptions of justice between traditional and specification grading approaches. The results of a paired-sample t-test demonstrate support for procedural, informational, and interpersonal justice but not for distributive justice (Table 7). Perceptions of procedural justice in specification grading were significantly different (and more positive) than perceptions of procedural justice in traditional grading approaches ($t_{(42)} = 5.388$, $p < 0.001$). Perceptions of interpersonal justice in a specification grading course were significantly different (and more positive) than perceptions of interpersonal justice in traditionally graded classes ($t_{(42)} = 5.382$, $p < 0.001$). Perceptions of informational justice in a specification grading course were significantly different (and more positive) than perceptions of informational justice in traditionally graded classes ($t_{(42)} = 3.694$, $p < 0.001$). However, there is no significant difference between perceptions of distributive justice in overall college grades and perception of distributive justice in the grade received in a specification-graded course ($t_{(42)} = 0.953$, $p = 0.346$).

Table 7
SUMMARIZED RESULTS FOR HYPOTHESIS 2 JUSTICE PERCEPTIONS

Paired Sample	Mean (S.D.)	95% C.I.	t (df=42)	Significance (2-sided p)
Distributive Justice (General vs. Course-Specific)	0.204 (1.400)	-0.227, 0.634	0.953	0.346
Procedural Justice (General vs. Course-Specific)	0.804 (0.978)	0.503, 1.105	5.388	<0.001
Interpersonal Justice (General vs. Course-Specific)	0.634 (0.772)	0.396, 0.871	5.382	<0.001
Information Justice (General vs. Course-Specific)	0.577 (1.024)	0.262, 0.892	3.694	<0.001

The third hypothesis proposed that students perceive specification grading as an appropriate proxy for workplace evaluations. This hypothesis was supported (Table 8). Student familiarity with workplace evaluations demonstrated a positive and significant effect on student perception of specification gradings as a valid proxy for the same (B = 0.305, p = 0.028). Familiarity with workplace evaluations accounted for 33% of the variance in student perceptions of specification grading as an appropriate proxy for workplace evaluations.

Table 8
SUMMARIZED RESULTS FOR HYPOTHESIS 3 PROXY FOR WORKPLACE EVALUATIONS

Variable	B (S.E.)	t (sig.)
(Constant)	2.091 (0.387)	5.398 (0.000)
Familiarity with Workplace evaluations	0.305 (0.134)	2.278 (0.028)

Note: B: unstandardized coefficient; Dependent Variable = appropriateness of Specification grading as a proxy for workplace evaluations.

Attitudes toward Specification Grading

Students were asked at the midpoint and end of the semester the following question, "What do (did) you like or not like about the approach to grading in this course? Please explain with specifics." Twenty-two students responded to the question at the semester's mid-point, and 28 responded at the end of the semester. At the middle of the semester, 59% of the responses were moderately to very negative, and at the end of the semester, 61% had the same sentiment. The positive sentiment (moderately to very) changed slightly, from 41% at the semester's mid-point to 39% at the end. Positive feedback provided by students explained the opportunity for autonomy and the ability to balance workload across all courses and other personal responsibilities. Some issues students had with specification grading were confusion over requirements and a lack of incentives to complete the work (Table 9)—other negatives related to the perceived effort for initial submissions and potential revisions.

Table 9
STUDENT SENTIMENT TOWARD SPECIFICATION GRADING

Tone	Example Statements
Very or Moderately Positive (Midpoint = 41%; End = 59%)	• I really liked how we could choose our grades based on the number of assignments we completed. Some courses require a larger time commitment, so it was nice that we had the opportunity to choose our grades and only complete the necessary assignments to obtain that grade. For example, I had a lot of group assignments this semester, so it was nice that I was able to opt out of the group project for [course] and still receive the grade I wanted. • I loved the style of mimicking the real world. The use of double submissions was a dream to have. As it really does allow you to take risks and develop the work rather than hope its gold the first time. I wish this were in all my classes.
Neutral (not coded by NVivo)	• I liked that the instructions were very clear and there was a defined "minimum." However, sometimes when schedules are busy, I wish I could get a 70 or sometimes even half credit and just move on. With this, it's either all or none which can be hard. • I do not feel the grading structure is bad, and it seems more helpful, but it is more confusing in that it is not like your regular grading in other courses. It just takes a little more time in getting used to if it is your first time dealing with it.
Very or Moderately Negative (Midpoint = 39%; End = 61%)	• I do not like how rigid the grading is. No matter how well you do, if you miss three or four assignments, you cannot earn greater than a C. The team project is also done in a strange way. It is optional, but you cannot earn an A in the course without doing it. However, if you don't meet the requirements for an A in any other category, the team project means nothing, and it was a waste of time. There are also no late submissions, so if you missed a due date, you could drop two letter grades. • I didn't like how doing well in one category doesn't carry over into the other grading categories. So if a student does very well on the tests but misses one too many classes, they could still receive a lower letter grade.

When asked if they would like to see this grading approach in other classes, the response was mostly positive, with 65% of the responses indicating they would like to see this approach used in other courses and 27% indicating that they would not like this approach used in other classes (Table 10). Two responses indicated that it depends on the instructor and the course.

Students who agreed that other instructors should use this approach liked the precise goals, clarity of the grade requirements, and clear connection between effort and the grade received. Students who did not like this grading approach did not like the opportunity for revisions; one commented on the lack of room for mistakes (even though revisions are allowed), while another commented on the dislike of having an opportunity to make revisions. Another student felt the approach to grading lacked the incentive to perform well.

Table 10 ATTITUDES TOWARD USING SPECIFICATION GRADING IN OTHER COURSES	
Tone	**Example Statements**
Positive	• Yes, it allows student to set a determinable goal at the beginning of the semester and have a clear plan on how to reach that goal. • Yes, it makes students learn how to manage their time. • Yes, the class is not a "give me" A. But students who put in the effort can get the grade of their choice as long as they work for it.
Neutral	• I think it depends on the instructor and / or the subject matter. There are certain subjects that require a firm understanding of all aspects of the field to strive into it, engineering just as an example. In these scenarios a stricter grading criterion would probably be more optimal. • Only if they are as efficient with it as [instructor]. I feel as though it takes only a certain type of professor to be able to structure their assignments, quizzes, and exams the way in which she did.
Negative	• Very much no. Sometimes I have very tough weeks and I want to do the bare minimum to get by without losing my mind. I would rather receive a low grade such as a C for doing subpar work than have to have the added stress of redoing an assignment entirely for subpar work. • No, I did not like how your grade would drop significantly due to one mistake.

Grade-Oriented Behaviors

Students were asked two questions about the behaviors required to get a desired grade ("Briefly describe your understanding of how to get the grade you want in this course") and the actual behaviors they engaged in to get their final grade ("What was the most important thing you did to achieve the grade you wanted in this course?"). After a manual inspection of student responses to these questions, it was apparent that, in general, students understood what was required to achieve their grade goal, as it was stated in the syllabus. A few students went beyond the syllabus requirements, describing other behaviors that led to their desired outcome, including accepting personal responsibility, being organized, meeting deadlines, and putting in the effort to get the desired grade. Enacted behaviors to achieve desired outcomes included attention to time management and organization, studying the course materials, taking personal responsibility for their effort, and choosing the work to complete based on the grade they wanted.

- "You work for the grade you want. The more modules and discussions you do, the higher your grade."
- "To achieve the grade desired, it helped to read every [assignment] ahead of time and figure out which ones I could do best."
- "The most important contribution I made to achieve my grade goal was to keep myself accountable with how many learning modules I could miss, attendance requirements, and the required test average. Keeping myself accountable to my A goal grade is how I was successful in this class."

- "I strived to achieve a C in this class. I did the minimum work requirements needed to do such a thing."
- "I monitored my assignments completed and that they met the course objectives in the pursuit to achieve the bare minimum. Seeing that it's my final semester, I did not feel it was necessary to shoot for the A."

Learning Impact

Finally, students were asked how the grading approach affected how well they learned the course content. The responses were mixed, with some students indicating no impact and others claiming the grading approach motivated them to learn (Table 11). Overall, there was a balance of positive (43%) and neutral (48%) responses, with only four students indicating a negative effect.

Table 11
ATTITUDES TOWARD LEARNING IMPACT

Tone	Example Statements
Positive	• I think it made me learn more and better. By eliminating the 100+ online assignments throughout the semester, you are forced to put more thought into every assignment. Meaning that you have to think deeper about the topic because each assignment feels and is more important to your grade. • It went very well with my learning. • A lot, I probably learned more about the content of the class with this grading approach since you have to pay attention to be able to complete the assignments.
Neutral	• I do not believe grading impacts learning. If an individual wants to learn the material, they will make time for it. • I don't think it was the grading as much as the assignments. • The grading didn't affect my learning much because even when I didn't do certain [assignments] or discussion posts, I still read and learned the topics
Negative	• I just wanted to pass one way or the other. I stopped trying to focus on learning so much as I was worried about submitting the work on time. • It made me not care about the material but rather just get the work done and over with.

DISCUSSION

Specification grading in higher education has grown since Nilsen's book was published in 2015. As a result, academics have investigated how specification grading relates to student attitudes and behaviors toward learning. This study contributes to the support for specification grading as a valuable approach to encouraging student mastery of course material and autonomy in the classroom. While the sample size is small, the results demonstrate that, in this instance, specification grading sufficiently discriminated between students who did and did not master the course material with positive and significant correlations between final course grades and exam averages in this sample. Students perceived the overall equity of specification grading to be

stronger than traditional grading approaches regarding procedural, informational, and interpersonal justice, but not distributive justice. Further, students perceived specification grading as a relevant proxy for workplace performance evaluations.

Student attitudes about the grading approach did not vary significantly over the semester. Some students like having control over their grades and being able to choose their desired grades. They appreciated each grade's clear guidelines and goals and liked that effort was rewarded. They also like that the grading approach is based on met or unmet grading and that the rubric is detailed and specific. They appreciate being able to highlight their knowledge beyond memorizing definitions.

However, some students disliked that the grading approach was confusing and different than how their other courses were graded. They found that meeting the grade requirements was more time-consuming and challenging in the specification-graded course, especially when specific assignments were challenging, or multiple learning modules were due simultaneously. Some students also disliked that there was no middle ground between getting full versus partial credit and that missing a few assignments affected their grades significantly. They found having optional learning modules to be demotivating. They also found the grading approach too compartmentalized and not necessarily motivational to push them to produce more than the minimum expected.

Students also shared mixed opinions about the pass-fail style for each assignment. Some students liked it because it eliminated subjectivity in grading, while others found it too strict. Some students appreciated the feedback, while others found it lacking, especially when passing or failing an assignment. At the end of the semester, students appreciated the flexibility and transparency of the grading approach, with some even expressing enthusiasm and satisfaction with the system. However, others have expressed dissatisfaction with certain aspects of the system, particularly the inflexibility of the grading scale and the uneven weighting of particular assignments.

Regarding the equity of traditional grading approaches versus the specification-based approach, students felt that specification grading was more procedurally fair than traditional grading approaches but no different in distributive justice. Further, the student felt the specification graded course allowed for increased interpersonal and informational justice than traditionally graded courses.

Practical Implications

Because the tests and assignments used in this specification grading approach were the same as would have been provided had the author used a traditional grading approach, the content or coverage of course material did not change, nor did the assessment of student learning. In this instance, the primary difference between the two approaches was allowing students to choose which assignments they wanted to complete based on their grade goal or the amount of effort they were willing to invest in the course.

Based on the student feedback (both positive and negative) and instructor experience, there are several implications to consider when adopting specification grading. Key takeaways of

using specification grading may be idiosyncratic, but these takeaways may be relevant for other instructors to consider.

- **Plan for revisions to the grading rubrics over multiple semesters.** It takes time and effort (and several iterations) to develop good grading specifications for each assignment and to develop an overall approach to grading that distinguishes "A" students from "B" students from "C" students. Both student effort and demonstration of content mastery should be included to ensure a clear distinction between the grading levels.
- **Teach students about the grading approach.** It takes time to "train" students on the grading approach, and instructors should allow for sufficient instructional time to explain the process and answer student questions.
- **Plan for additional grading time.** Giving students a chance to revise sub-par work requires the instructor to grade some assignments a second time, which will add to their workload.
- **Provide feedback at multiple points in the assessment process.** Explanations of grading included with the assignment instructions and feedback shared during assignment assessment reduce potential confusion about the grades received. Feedback should identify where student work is deficient and explain to the student how they can earn full points with a revision.
- **Break down large projects into multiple deliverables.** Have students submit large projects (e.g., research papers or team projects) in parts to allow them time to fix mistakes early so the final product is of higher quality than it would have been without the interim feedback. Each component should include clearly stated specifications to guide student work.
- **Illustrate to students how the final grade is affected by not submitting specific assignments.** Because this method was new to students, it was helpful to give examples of how to achieve each grade and show what happens when required assignments are not completed or do not meet the requirements.
- **Offer frequent feedback on progress toward final grades.** At certain times during the semester, share with students how they can determine their grade progress or post an interim grade. Additionally, indicate when students are no longer eligible for an A or B grade. It might be helpful to remind the students who did not submit the first assignment required for an A that they are no longer eligible for an A.
- **Be prepared to explain the benefits of this approach to students and administrators**. Many educators are reviewed annually by their college or university administrators, and it is essential to educate them on the benefits of specification grading and what the instructor is attempting to accomplish. Include the research on specification grading and steps taken by the instructor to educate students on the process and continuously improve the grading approach within annual performance reports.

Theoretical Implications

The motivation toward learning or receiving grades has been investigated for several decades. Scholars investigating student motivation have uncovered several interesting findings on the antecedents and consequences of these motivations. Students primarily motivated by learning focus on acquiring knowledge and skills and find learning intrinsically rewarding (Meyer et al., 2019; Pollio & Beck, 2000). On the other hand, students who are primarily motivated by grades focus on the results of their efforts (e.g., course grades) rather than the learning process (Pollio & Beck, 2000; Vallade et al., 2014). In other words, learning-oriented students seek mastery of the content, while grade-oriented students focus on their performance (Meyer et al., 2019).

Specification grading emphasizes mastery of course content and meeting performance outcomes, so both learning- and grade-oriented students were expected to be satisfied with the grading approach. In the current study, students indicated mixed perceptions of how the grading approach affected their learning. While many students mentioned that the grading system forced them to learn and study the material, some expressed concerns about focusing more on grades than authentic learning. Some students mention that the grading system helped them to understand the course content better by forcing them to apply the material to assignments, discussions, and quizzes. However, other students mentioned that the grading system made them less interested in learning the material and more concerned with finishing the work. Further research should be done to investigate the relationship between attitudes toward specification grading and student learning and grade motivations.

Limitations and Future Research Directions

The limitations of this study are typical of teaching innovation studies in that generalizability may be limited to the specific sample investigated. However, as with other case studies in teaching innovations, the student attitudes and perceptions presented here may benefit academics considering implementing specification grading in their courses. Knowing the possible responses may help academics develop their approach to specification grading that strengthens positive attitudes toward it.

Given the small sample size used in this study, generalizability of these results may be limited. Thus, it will be necessary to evaluate these hypotheses on a more extensive data set across multiple courses, semesters, or universities to increase general applicability of these findings. Conducting a systematic review of reports that focus on the outcomes of specification grading may be helpful. While there are many studies on individual applications of this approach to classroom evaluation, it may be helpful to quantify the relationships with student performance, learning, and attitudes across contexts. Doing so will provide academics interested in applying specification grading in their courses with a valid justification when administrative leaders question the efficacy of such an approach.

Future research should also explore instructor effort, feedback quality, the effect on learning outcomes, and the practical design of grading specifications. While these concepts were briefly discussed, more data must be collected across multiple contexts to develop a deeper picture of the effort involved with specification grading approaches.

CONCLUSION

This study aimed to evaluate student attitudes and behaviors in a specification-graded management course. The results show that specification grading does not significantly affect the expected alignment of final course grades with summative performance measures and may contribute to student autonomy and perceptions of grade-related justice in the classroom. This grading approach exposed students to an evaluation method like what they would experience in the workplace, which is where many business and management students go after graduation from college.

Practical implications have been provided to instructors who want to implement specification grading in their courses. Implementing specification grading will take multiple iterations and require the training of students, administrators, and other interested parties on the benefits and expected outcomes. Instructors should be aware of the time commitment before and during the course to ensure the students understand what is expected of them and how they will be assessed.

Finally, theoretical implications have been identified, along with directions for future research based on the current study's limitations. Future research on the relationship between grading approaches and student learning and grade orientation across multiple contexts is warranted and will expand the potential generalizability of these findings.

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WORKPLACE CONFLICT: SOLVING THROUGH CULTURAL DIMENSIONS AND EMOTIONAL INTELLIGENCE

Deirdre Dixon, University of Tampa
Meg Wladimirski, University of Tampa
Holly Tompson, Leadership Development Institute at Eckerd College

CASE DESCRIPTION

This case concerns workplace conflict, and the secondary issues to examine to conflict include emotional intelligence (EQ) and Hofstede's cultural dimensions. The case is designed for undergraduate students in organizational behavior, principles of management, and international management. This case is designed to be taught in one class period, from 1 to 3 class hours, depending on if the instructor assigns the readings prior to class or it is done in class. There are no outside readings expected but it is expected that the class will be already familiar with EQ, Hofstede's concept of Cultural Dimensions and personality assessments in general.

CASE SYNOPSIS

The purpose of this case study is to analyze a conflict in a finance team of 25 people who work at CaliWeb, a large technology company headquartered in California. A manager, Marcelo, and a direct report, Tom, were having difficulties in their relationship, and it was affecting the performance and harmony of the rest of the team. The senior director of the team, John, had been aware of the situation for a while and did not know how to mitigate this conflict. The company was going through a restructuring phase that was causing uncertainty among employees in the finance team. Several employees reported being anxious about how their job descriptions might change after the restructuring. Furthermore, there was evidence of cross-cultural clashes and a wide range of EQ variance among team members.

Marcelo and Tom had frequent disagreements about decisions and policies in the department. Their disagreements had become public and many people on the team had begun to "take sides." In addition to their professional disputes, their relationship was complicated by their different cultural values. In addition, both employees were unable to manage their emotions and to understand the other person's feelings. The animosity had reached the point that Tom threatened to leave the company. Thus, John needed to find a solution in the next two weeks before one of the team's best employees was gone.

This case study shows how emotional intelligence, national cultural dimensions, and personality can impact conflict behaviors within teams. The situation in this case is based on actual events. The names of the people and company have been altered to preserve anonymity.

Key Words: *Conflict, Emotional Intelligence, True Colors, Hofstede Cultural Dimensions*

BACKGROUND

CaliWeb[1] was an American multinational organization with the headquarters in California. The firm was founded in 1998 and it served the internet industry. It had over $4 billion in revenue and more than 7000 employees in 2019. Since 2002 the company has been performing acquisitions to sustain its growth (Reuters, 2020).

Two years earlier, the organization performed its largest acquisition which changed the structure of most of the teams. For instance, the Americas' Finance team used to be small with only 12 employees and after the acquisition it became a team of 25 employees. Some of the new employees that came with the acquisition were having a hard time adjusting to the company's culture such as working with their direct managers. To encourage better alignment of the company's goals and objectives, the executives decided to change the organizational structure and concentrated all the decision making for the Americas with the North America team. The executives brought a few managers from South America to join the North America team and help with the process of standardization. This change helped standardize the company's operations, but it also brought cultural issues and conflicts.

THE CONFLICT

Marcelo, and his direct report Tom, had been having frequent conflict for a few months and the rest of the team had started noticing that something was not right. Marcelo and Tom had distinct personalities, nationalities, and they were often unable to put the differences aside and work professionally together. Marcelo liked to communicate openly, to be creative and to be appreciated. While his direct report, Tom, was more independent, liked to have more time alone and was very resistant to change.

Marcelo became Tom's manager about 18 months ago when he was transferred from the Brazil team to the United States, to manage the US Finance team. At first, Marcelo's transition to the US seemed to be working just fine. Marcelo was enjoying his new position and his direct reports. Marcelo would take them for lunch and drinks on Fridays and by all measures, the team was reaching its targets and working well together. After a few months in the position, Marcelo started to get frustrated with some of the behaviors of his direct report, Tom, and took them personally. Tom started to show up late to work, take long lunch breaks, schedule vacations on

[1] 1 The facts of this case are true; the name of the company and the people have been altered to preserve anonymity

busy weeks and would frequently question Marcelo's ideas and decisions. Tom would regularly challenge Marcelo with questions like "Why do we have to do this? I don't see a purpose for this report." In the beginning Marcelo would explain the reasoning behind the decisions, however he noticed that Tom was questioning everything, and Marcelo felt he was doing it to be annoying.

Because of the interpersonal friction, Marcelo started to get very frustrated. However, he didn't discuss the matter with Tom. Instead, Marcelo discussed his concerns with the other managers. Marcelo's complaints always followed a pattern like: "I don't know what to do with Tom. He is always late, does not care about the work and doesn't listen to me." The other managers would say: "You should have a one-on-one conversation with Tom, let him know how you feel and what is bothering you." Finally, Marcelo accepted their advice and scheduled a time to discuss the matter with Tom. By that time, however, things were very tense, and the meeting did not go well. Tom was upset because he felt falsely accused. He claimed that his work was getting done correctly, even though he wasn't always on time or at the office. After realizing that the meeting did not resolve any of the animosity, Tom talked to the director, John, and said he wanted a new manager, or else he would start looking for a new job within the next month. John had been aware of the friction since the beginning but did not intervene or take assertive actions to resolve the conflict between Marcelo and Tom. After hearing from Tom, he realized the situation was worse than he expected. Under Tom's threat of resignation, he knew it was time to get involved with this conflict.

John felt he had two options. First, he could split the team, so that Tom would report to a different manager. This option would not resolve the conflict, but it would avoid future conflict because Tom and Marcelo would no longer be required to work together regularly. A drawback of this option was that the other managers in the team had heard Marcelo's side of the story, and many believed that Tom was difficult and lazy, so they did not want to have Tom on their team either. Second, John thought he could make a concerted effort to help Marcelo and Tom resolve their differences in a healthy way. He recognized that progress would be slow and difficult, but it would be a win/win outcome if he could pull it off.

THE MANAGER'S PERSPECTIVE

As John contemplated how to help resolve the clash between Tom and Marcelo, he decided to write some notes about their characteristics. Table 1 summarizes his observations about the differences between the two.

Table 1: John's Notes on Marcelo and Tom

	Marcelo	Tom
Communication	Prefers frequent meetings with small groups; often they are unplanned. He turns a coffee break into a casual work meeting. He encourages full involvement and enjoys the give-and-take in group settings. Seems reluctant to correct a person, even when it's obvious the person is wrong about an idea.	Prefers to write detailed memos to his department. They are often complicated and analytical. He sends them by email wants the recipients to "reply all" to discuss the memos. His email responses are usually very direct and factual. In meetings, he tends to be succinct and sometimes forceful.
Planning	A bit of a dreamer. Likes to talk about the big picture and the big plans to get there. His office has posterboards and flip charts with scribbles and figures all over the place.	"Practicality" is the key word here. Not an optimist or a pessimist – he just wants to make a rock-solid plan and get all the details planned for the next few weeks.
Teamwork	Wants input from everyone. Even non-employees occasionally! Still asks advice from an uncle in Brazil when he is finalizing finance proposals. Also is generous with giving credit. Likes to share good results with anyone who was involved in a project. Sensitive to the relationships within his direct report group.	Not even sure if Tom likes teamwork. I've seen him produce amazing work, but he rarely asks for help, and he doesn't usually accept the suggestions when people do make them.
Professional interactions	I see he likes to maintain his status as the leader of his group. He is warm and welcoming, but he likes his title and the authority that comes with it. New to the team and unfamiliar with some USA norms but is proud of his role.	Sometimes seems unaware of the organizational structure. Sometimes talks to my boss about issues when he should talk to Marcelo. Seems a little disrespectful of authority.
Conflict	Seems like a conflict-avoider person. Doesn't want to have the hard talks with Tom. I wonder if he hopes it will "smooth over" without working on it. He seems truly offended but is being too passive about it.	Reminds me of a bulldozer. Powers ahead without noticing any bumps or boundaries. I don't think he's bitter or mean but kind of oblivious to how he can be harsh and how it affects others in the team. Also shows signs of a temper when people disagree with him.
Interpersonal relations	Definitely cares about people – his direct reports and everyone in Fin. Department. Almost seems like he should be in the HR department. Wants people to like him and like the company. Knows people's kids' and spouse's names!	Gives great advice to people, but only when they ask. Doesn't go out of way to help & isn't patient when people are slower than him. He is sharp but doesn't understand why people won't follow his logic. Or why they can't solve their own problems.

TRUE COLORS 24 ASSESSMENT

In addition to his observations of Marcelo and Tom, John had the advantage of data from the True Colors 24 personality test (Honaker, 2013). As part of the re-structuring initiative, he required the finance team in North America to take the assessment.

John hired a consulting firm that assisted in developing leaders and high performing teams. John told the team: "This assessment will help us learn more about each other and how to interact better as a team. It is designed to help individuals understand their character traits and their main decision-making approach."

The True Colors assessment categorizes people into one of four personality styles. Each style is assigned a color code: gold, orange, blue and green. **Gold** describes people who are detail-oriented, structured, organized, realistic and who have a strong sense of right and wrong. **Orange** is the opposite color from gold, people in the orange category are spontaneous, impulsive, high energy, playful, adventurous, and action oriented. **Blue** is for people who are caretakers, sensitive, great listeners, harmony-driven and who value relationships. Finally, **Green** is the opposite of blue and includes people who are very analytical, see the big picture, innovative, future focused and don't need a lot of recognition (Honaker, 2003). Table 1 shows the self-image of each color and their main characteristics and table 2 illustrates the one-word associate to each color.

Table 2: Descriptions of the Four Categories

Primary ORANGE	Primary GOLD	Primary GREEN	Primary BLUE
Energetic, spontaneous, and charming. If you're an Orange, you tend to be action-oriented and are comfortable taking risks. You probably also tend to be competitive and seek out adventures with opportunities to push the boundaries. Living in the moment and enjoying an adaptable time schedule are important to you.	Punctual, organized, and precise. "Golds" tend to need structure and organization. If you're a Gold, then order, rules, respect, and dependability are important to you. Time is a key part of your life if you're a Gold personality type. You need to be on time and want others to be punctual as well. Following the plan or schedule is best for you.	Analytical, intuitive, and visionary. These are traits of the Green Personality type. "Greens" find innovative thinking and problem solving exciting. If you're a Green, you tend to be able to see the big picture and able to effectively analyze situations. Thinking outside the box is a real strength. You also have an extreme need to be right.	Empathetic, compassionate, and cooperative. "Blues" tend to be very social people. If you're a Blue, you value relationships and harmony. Genuine kindness, sincerity, and compassion are important to you. You enjoy opportunities to work with others and collaborate and any opportunity to develop a connection.

(TrueColors, 2019)

Table 3: One-word Association of the Four Colors

Primary ORANGE	Primary GOLD	Primary GREEN	Primary BLUE
ADVENTUROUS	**TRADITIONAL**	**VISIONARY**	**NURTURER**

(O'Brian, 2019)

The results of the True Colors assessment gave John some valuable insights. His result showed that gold was his primary color and orange was his weakest. He managed a large group of employees, so John tried to be task oriented, extremely responsible and organized. He was not

very open to change; however, and therefore he was having a hard time dealing with the issues in the team.

Marcelo had blue as his primary color, whereas Tom had the opposite primary color, green. Marcelo preferred a collaborative way of working that resulted in meaningful outcomes. He also liked to apply his imagination and personal values in decision-making, which could have been related to his Brazilian culture. On the other hand, Tom preferred a more efficient decision-making process that resulted in logical outcomes and liked to apply analytical skills to his decisions. The main point was that Marcelo focused on needs, values and relationships, whereas Tom was more of a logical person and appeared to be uncaring and insensitive to Marcelo.

CONCLUSION

As the year came to an end, John had two weeks to find a way to solve this conflict and bring harmony and effectiveness back to the team. Otherwise, Tom, one of his best employees, said he would leave. John became more familiar with the cultural differences and the personality of the employees based on the True Colors assessment. He was also aware that the team needed more training and information sessions regarding emotional intelligence and the cross-cultural norms so they could better work together. John needed to decide how to approach Marcelo and Tom and had to find a way to solve this conflict without negatively affecting the rest of the team.

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THE INCREASING PROBLEM WITH TEXTBOOK PIRACY

Richard G. Taylor, Texas Southern University
Elham Mousavidin, University of St. Thomas
Marion Smith, Texas Southern University
H. Kevin Fulk, Western Carolina University

ABSTRACT

Textbook piracy is a continuous problem that has evolved as the digital era has progressed. Digital rights management (DRM) technology and legal action against pirating websites have been implemented to combat textbook piracy. However, the cheapest option to get a textbook is to download a copy from the Internet, as opposed to renting or purchasing a used copy. This paper conducted a qualitative study to investigate the current problems with student textbook piracy and look at the repercussions on the education industry. The purpose of this research is to assess academic textbook piracy, including its sources, effects, and proposed remedies. This qualitative study includes comments from students, faculty, and textbook publishers regarding their thoughts and opinions on textbook piracy.

INTRODUCTION

Imagine you are a Business Management student. The semester has just started, and your professor tells you that you need to buy an expensive textbook for the class ~~y~~ou will only need for a short period of time. One of your friends also told you about a website where you can download the book for free. Tempted with the thought, you are faced with a dilemma. Buy the book or get it for free with the click of a mouse? For many, the latter option may seem like the best choice.

The unlawful use, replication, or distribution of copy-protected textbooks is textbook piracy. Students have turned to these illegal measures because of the rising cost of textbooks. Textbook piracy has been a topic of concern for many years. According to the Canadian Alliance of Student Groups in 2020 (Nemec, 2020), 50% of postsecondary students in Canada reported accessing free or inexpensive alternative resources, such as illegally obtained textbooks. In 2021, 78% of US students purchased course materials, 35% rented, and 30% downloaded materials for free (Follett, 2022).

In addition to rising school costs, the average cost of textbooks has risen approximately four times faster than the rate of inflation (Pilgrim, 2020). Individual textbooks routinely exceed $200 and because of this high cost of textbooks, 65% of students skip purchasing their required books. (Pilgrim, 2020).

Internet piracy has been a major concern for decades and can be traced back to the early days of the Internet. The development and evolution of online piracy have been influenced by technological advancements, changes in consumer behavior, and legal and governmental responses.

LITERATURE REVIEW

In an effort to combat Internet piracy, Congress approved the Digital Millennium Copyright Act (DMCA) in 2004. The DMCA provides copyright holders with legal protection and a mechanism for the removal of copyrighted content from Internet sites (Johnson, 2020). In the 2010's, online piracy continued to increase as new technologies and file-sharing sites were created. In addition to The Pirate Bay, many other sites arose that allowed users to download even very large files using torrents. These new sites saw a 1390% increase from 2016 – 2019 (Spajic, 2023). The ultimate contributing factor to online piracy has been the increase in users' understanding and feeling comfortable working with technology. In addition, the increased speed of the Internet has significantly decreased the amount of time it takes to download unlicensed copyrighted material.

Current State of Textbook Piracy

Digital technologies have made it easier to copy, share, and distribute copyrighted materials, including textbooks. Google and other search engines have made it easy for students to find the textbooks they require and provide them with a link to download the material. Many of the textbooks are in simple ".pdf" format which can be directly downloaded to any digital device. While not all copyrighted textbooks that are available online can be easily located with a simple browser search, continued diligence typically results in locating the needed textbook (Hati et al., 2020).

Because textbook piracy is an unlawful and often unreported practice, there is little documentation on its overall scope. Many studies, however, have tried to determine the prevalence of textbook piracy in academia.

Use of digital resources continues to increase. In 2020, one of every five purchased materials were digital products, a huge increase from the ratio of one of every seven paid materials in 2019. From spring 2019 to spring 2020, the percentage of students who downloaded free textbooks doubled, from 14% to 26% (Nemec, 2020).

Many factors influence students' pro-sharing attitude. Some of these include their immersion in technology and the lack of a deeper moral understanding of why watching movies online or downloading music is illegal. A strong majority (70%)of younger online users find nothing wrong with online piracy (Vuleta, 2023).

According to digital piracy statistics, the millennial generation is most likely to consider piracy normal. Several factors contribute to this normalization, such as their pro-sharing attitude and preoccupation with the online world (Valuta, 2023). Table 1 (Follet, 2022) shows how textbook piracy has been increasing at an alarming rate over the last few years.

Table 1
Percentage of Pirated Textbooks

Year	% of Pirated Textbooks
2019	13%
2020	26%
2021	30%

Adapted from Follet (2022). Outcomes made accessible: Improving outcomes and retention while lowering the cost of college learning materials. *Follett Higher Education White Paper*. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://highered.follett.com/insight-content/outcomes-made-accessible-improving-outcomes-and-retention-while-lowering-the-cost-of-college-leraning-materials/ Accessed December 4, 2023.

There are several legal ways to acquire a textbook. Typically, new textbooks are more expensive, but they may contain updated content and supplementary materials. Used textbooks can be a cost-effective alternative, but they may not be in ideal shape and might not include all the resources that come with new textbooks, such as pass codes to online homework assignments. Renting textbooks is becoming an increasingly popular alternative for students seeking to save money. Most campus bookstores and online sellers provide rental alternatives, allowing students to utilize the textbook for a semester or year at a lesser cost than purchasing a new textbook. If a student does not need to keep the textbook once the course has ended, textbook rental may be the best choice. E-books are downloadable digital textbooks that can be read on a student's electronic device. They are usually cheaper than printed textbooks and can be accessed from anywhere there is a web connection.

METHODOLOGY

To investigate the issues of textbook piracy a qualitative study was conducted. Qualitative research is effective when researching a complex subject such as textbook piracy, which is illegal. It is difficult to study this issue outside the context in which it occurs (Benbasat et al., 1987). It may be difficult to get honest answers to questions regarding textbook piracy, therefore the qualitative method will allow the researcher to conduct probing questions (Benbasat et al., 1987).

In this study students from the author's classes were asked to respond to a question posted in a discussion forum. Out of approximately 200 students 121 participated. Students were junior and senior undergraduates, who it was felt would have had more exposure to textbook piracy. The discussion forum proposed the following: "I have found that there are many sites online where you can download .pdf versions of textbooks for free. Have you ever, or would you ever do this?". Faculty members were then asked to give their input on textbook piracy and if they would attempt to deter their students from downloading pirated textbooks or encourage them. Finally, five representatives from textbook publishers that were contacted were questioned. Open-ended questions were posed to the representatives to understand the depth of the problem

with pirated textbooks in the publishing industry and how it has affected the industry and their business plan for the future. The study was conducted at one of the Historically Black Colleges and Universities (HBCUs). Students in HBCUs tend to be more financially disadvantaged, therefore a heightened knowledge of textbook piracy could be present.

FINDINGS

Below are the findings from the interviews with the students, faculty, and textbook publishers. Throughout the study students identified reasons why they pirated textbooks. After reviewing the comments from the students, several areas were identified that caused them to pirate textbooks, including the costs of the textbooks and the need for the textbook for the course.

Costs of textbooks

Textbook piracy is a global issue affecting students everywhere. The high cost of textbooks continues to be a significant motivation for students to utilize pirated textbooks (Weisbaum, 2016). Students are concerned about their grades if they do not have the required textbook.

Although textbook piracy is still in its infancy, it has already had a significant influence on the way students access and utilize educational resources. As technology evolves, it is likely that textbook piracy strategies and techniques will also evolve (Gakhar & King, 2020).

According to Welding (2023), the high price of books was the top reason given by students who decided not to obtain the required texts, however 38 percent said they did not want them or did not believe they would need them.

The cost of printed textbooks has risen by 65 percent over the past decade (Pilgrim, 2020). In order to recover their investment and compensate for lower sales, academic publishers have established high prices for college textbooks.

Normally, students pay hundreds of dollars per semester for tuition alone, often through student loans. The high cost of textbooks adds substantially to student loan debt. According to a study, 65% of students reported not acquiring a required textbook due to its high cost, with 94% of those students reporting that they were concerned that it would affect their grades (Welding, 2023). These high costs also have a greater impact on low-income students who already have trouble trying to make ends meet.

Students are often caught in a lose-lose situation. They need the textbooks for class, but the costs are prohibitive. As long as the market is controlled by a handful of publishing giants that profit from students' necessities, it could stay that way. Students have to find ways to pay for textbooks. Around one-third (30%) of students reported paying for textbooks with financial aid (Welding, 2023).

The overall student loan debt in the United States hit $1.7 trillion at the end of 2022, with the average student loan debt after graduation being $37,574. (Welding, 2023).

According to a Student PIRGs poll, 15% of students reported borrowing money to pay for textbooks, with an average loan amount of $1,205. According to the poll, 48% of students

chose not to purchase a required textbook because of its high price, with 29% of those students saying that they had postponed or delayed medical care to pay for textbooks. Students also claim that to purchase their textbooks they had to miss meals and family visits (Lederman, 2018).

High textbook prices may have long term impact on students. Ultimately this could prevent the student from investing in their future by buying a home or starting a business. According to the National Bureau of Economic Research, students are 1.6% less likely to purchase a home by the age 30 for every $1,000 increase in student loan debt (Hati et al., 2020).

Large amounts of student loan debt can also affect students' career options and choices, as they may be pressured to pursue higher-paying employment rather than pursuing their dream job in order to repay their loans. Students who cannot afford to purchase the required textbooks may not have the appropriate tools for academic success, ultimately decreasing their future employment opportunities and earning potential (King & Gakhar, 2019).

The high cost of textbooks can pose substantial academic and psychological difficulties for students. The stress of being unable to afford necessities such as food and shelter can negatively impact a student's mental health. Financial difficulties may increase anxiety and cause depression, making it more difficult for students to concentrate on their education (Hinojosa, 2020).

Because of the aforementioned issues, some students believe that obtaining textbooks illegally through online piracy is the only option they have to get the required materials they need to complete their education.

Need for Textbook

Textbooks are a crucial component of many courses because they offer students the information and background knowledge necessary to comprehend course material. Textbooks may also include supplementary resources, such as study guides, Internet access codes, and practice examinations. Yet, the extent to which textbooks are necessary can vary among courses, teachers, and schools. Some courses may need students to purchase many textbooks, while others may heavily rely on lecture notes, Internet resources, or other types of teaching materials.

Professors may ask students to purchase textbooks they never use in class for a variety of reasons. Instructors may require students to purchase textbooks to guarantee that they have access to all the course information, even if it is not specifically taught in the class. Teachers may believe that the students will be better prepared for examinations and other assessments and will have a solid foundation of knowledge about the course available to them.

The number of students who purchase textbooks that are never used in class depends on a number of factors, such as the teaching style of the teacher, the course subject, and the usefulness of the textbook to the course subject.

Underutilized textbooks are quite prevalent, and students may be electing not to purchase textbooks because of financial concerns. Before requiring textbooks, teachers should consider the cost of textbooks and the possible financial burden it may have on their students. Teachers often do not consider the financial position of the students.

More than a third of students reported not having their prescribed textbook on the first day of class because they wanted to know if the textbooks listed in the syllabus or at the bookstore would be necessary for the course (Koenig, 2019).

In recent years, the proportion of students who have the majority of their textbooks purchased on the first day of class has decreased. In 2019-2020, only 34% of students had the majority of their textbooks before the start of sessions. 67% of students who did not receive their textbooks by the first day stated that they waited to determine whether the materials were necessary (Nemec, 2020).

Some students lack access to all materials in textbooks. In 2019-2020, around 28% of students report not obtaining at least one of their required textbooks, up from 25% in 2018-2019. Although 57% of this group identify price as a factor, they also cite other reasons, such as not desiring the textbook or not believing it was necessary (45%), other students saying it was unnecessary (35%), or the professor saying it was unnecessary (29%) (Nemec, 2020).

Sixty percent of respondents indicated they did not believe their decisions had affected their grades. But around two-thirds agreed or strongly agreed that their academic performance would improve if they had access to all textbooks on the first day of class (Lederman, 2018).

Because professors often require students to purchase textbooks that are never or rarely used in the course is another reason students claim for resorting to textbook piracy. "Students want to wait to see if the professor is really going to use it and if it's really going to be necessary for class," says Lisa Malat, COO of Barnes & Noble College (Welding, 2023).

The high costs, along with students' perceptions of the necessity of a textbook are reasons students delay or even avoid purchasing textbooks. (Welding, 2023).

By obtaining illegally pirated textbooks, these problems are no longer a concern for the students, so they feel better prepared for class and feel their overall performance can improve. It no longer matters if the textbook will be used in class. If it is free, then it is of no concern to them. Table 2 (Vorias, 2021) shows the reasons students avoid purchasing textbooks.

Table 2
Why Students Avoid Textbooks

Why Students Avoid Textbooks	Percentage
Students who delay or avoid purchasing required materials	85%
Students who say this decision negatively impacted grades	50%
Students who cite cost as a reason for not purchasing	91%
Students interested in including the costs of textbooks with tuition	78%

Adapted from Vorias, T. (2021). College textbooks: The final blow of higher education's affordability crisis. *The Michigan Daily*. August 10, 2021. https://www.michigandaily.com/opinion/columns/college-textbooks-the-final-blow-of-higher-educations-affordability-crisis/ Accessed Jan 18, 2023.

Methods of Textbook Piracy

As students' knowledge of their ability to get their textbooks for free increases, it becomes an easy decision for them. The legal methods mentioned above are costly and the pirated option is free.

Campbell's Biology, eleventh edition, is one of the most popular biology textbooks among university students worldwide. A new copy of the eleventh edition of Campbell Biology, for instance, might cost more than $200. A digital version, or e-book, of the same edition can be much less expensive, starting at approximately $55; a new loose-leaf version on Amazon costs more than $90 (Powell et al, 2021). However, no matter how low the costs become, the .pdf version of the book can still be easily found on the Internet for free. For a student, saving even $55 can have a positive impact. Even students without financial difficulties may be unwilling to pay for something they can get for free. This generation of students have been raised in a time when music, movies, and games are freely available through online piracy. The generation is also tech savvy and has little problem finding what they are looking for. There seems to be little or no ethical concerns from the students or any fear of legal ramifications.

Pirated textbooks appear on a variety of sites, including "pirate libraries" that show in Google searches, unlawful PDFs on eBay, counterfeit physical copies on Amazon, hidden file-sharing groups on Facebook, and the sharing of USB drives by individuals. (Jenkins et al, 2020).

In November 2022, those operating Z-Library, a popular site for pirating textbooks, were arrested and charged with various crimes including copyright infringement, wire fraud, and money laundering (Woodcock, 2022).

Library Genesis was a site that was operated by Z-Library, but they were able to keep a mirror site running to allow continued access to pirated textbooks (Woodcock, 2022). As sites are identified and closed, others open to take their place. In many cases it is the very same site that has just been renamed and rebranded.

Many times, textbooks can be found with a simple Google search. Other times students have to be more tech savvy to search the Internet or the dark web, but with a little perseverance, pirated copies can usually be found. The author conducted a search of 30 textbooks that were currently being used in the business school and was able to find pirated versions of each.

Peer-to-peer (P2P) file-sharing networks and chat forums also provide access to pirated textbooks. Social media sites may also be a way to find pirated textbooks. Students can search social media platforms for organizations or sites that specialize in distributing pirated resources, such as textbooks. Some groups and pages may be private and require an invitation or approval to join. By far the easiest way to obtain pirated textbooks through social media is to post a comment asking if someone has access to a textbook or can tell you where to find one.

Reddit is another popular forum where you can find the textbooks you are looking for. First you can simply search www.reddit.com for the textbook, If the initial search is unsuccessful, you can simply create a post asking for someone to provide you with the specific textbook, by including the book name, author(s), edition, and ISBN.

Not all textbooks can be located online for free download. However, this does not mean that a textbook cannot be obtained for free. There's a good chance other students are also looking for the same book, which cannot be found on Reddit. Reddit also provides students with instructions for finding free textbooks (Reddit, 2023). Students can also utilize the non-technical way of pirating textbooks by simply using a copy machine to make a duplicate copy for a classmate.

When textbooks are purchased online through websites such as Amazon or through a book publishers' website, they are protected through digital rights management (DRM). DRM involves encrypting digital content with a unique key, so that only authorized devices may access it. This can include limits on the total number of devices that can access the material, as well as limitations on copying, printing, or distributing the content. DRM solutions can also be used to prevent content modification and reverse engineering. DRM is designed to protect the intellectual property rights of content creators and distributors, and to generate income through the sale or licensing of digital material. DRM is widely used in the digital textbook market (Reddit, 2023).

Typically, leased versions of textbooks arrive in ".azw4 format", whereas the purchased editions arrive in ".mobi format", both of which are DRM-protected. Certain piracy websites instruct users on how to remove the DRM that is intended to protect the copyright. DeDRM is a method to remove Digital Rights Management (DRM) restrictions from digital content. This allows the content to be shared on any device (Reddit, 2023).

DeDRM is a controversial topic, as it may violate copyright laws and is generally seen as unlawful. DeDRM technologies are not endorsed by e-book publishers or authors, and their use might have legal and ethical repercussions. Users should evaluate the possible implications of using DeDRM technologies and to prioritize ethical behavior and intellectual property protection (Reddit, 2023). To use DeDRM you need to have a specific level of technology knowledge, but instructions easily found online.

POTENTIAL SOLUTIONS

There are potential solutions available to curb the increasing amount of textbook piracy. Open-source textbooks are freely available to students. If professors would adopt these textbooks students would not have to pirate a textbook for their class. Another potential solution is to appeal to the ethical issue of textbook piracy. It is against the law and breaking the law has potential negative ramifications. Ethical considerations were useful in preventing the pirating of music (Nemec, 2020). Government programs have been created that may reduce the amount of textbook piracy. Most students agree that they would prefer textbooks to be included in the cost of their tuition (Welding, 2023). Finally, textbook publishers are playing their role by offering books to rent at a much more discounted price.

Open-Source Textbooks

A small number of schools have adopted open-source resource texts to address access and cost concerns. This eliminates the total cost of teaching materials for the student. Only around 6% of schools have adopted this curriculum model to date (Pilgrim, 2020). Open-source material is peer-reviewed academic content distributed under an intellectual property license permitting free use.

Open-source textbooks have the potential to save money for students. Open-source book proponents, such as the Bill & Melinda Gates Foundation and the Student Public Interest Research Group, emphasize the affordability of such textbooks as a solution to the escalating cost of college tuition. Textbook publishers adamantly oppose the use of open-source textbooks because it threatens their overall business model of selling textbooks to students (OnlineSchools.org, 2023).

OpenStax has served over 14 million students with its free textbooks. More than 36,000 instructors have adopted OpenStax textbooks. OpenStax textbooks are now used in 60% of universities that are degree-granting (Falk, 2020). In 2020, OpenStax has saved students approximately $1.2 billion in textbook costs (Falk, 2020).

Open-source textbooks are a valuable resource for universities and a great benefit for students, however these benefits can only be realized if instructors at universities choose to use open-source material as the textbook for their courses. Table 3 (Jenkins et al., 2020) shows a list of open-source resources available.

Table 3
Open-Source Resources

Source	Offerings
OpenStax	Operated by Rice University providing peer reviewed, quality open textbooks with interactive components
Open Textbook Library	Hundreds of complete, open college-level textbooks collected by the University of Minnesota.
BC OpenEd	A curated collection of open textbooks, many reviewed by British Columbia faculty.
WikiBooks	A project of the Wikimedia Foundation, this collection of group written textbooks in a variety of sources follows rules similar to Wikipedia.
Project Gutenberg	Find the full text of classics and public domain works from the first massive eBook creating organization in existence. Nothing fancy here, just files with the full text.
Google Books	Some books presented in this mass conglomeration of scanned books are fully available, most are excerpted.
American Institute of Mathematics	A list of open textbooks in various subdisciplines of Mathematics approved by the AIM editorial board.
Aviation Handbooks and Manuals	Open Textbooks on Aviation from the Federal Aviation Administration (US).
FreeBooks4Doctors	Free medical textbooks.
Lyryx Open Textbooks	Lyryx offers high-quality open textbooks in the fields of accounting, mathematics, and economics. They also have optional added (paid) resources such as homework and quizzes to accompany the open textbooks.
Bloomsbury Academic	Bloomsbury is a well-respected and longtime UK publisher who has released some of their academic titles for open access/open education.

Adapted from Jenkins, J.J., Sánchez, L.A., Schraedley, M.A.K., Hannans, J., Navick, N. & Young, J. (2020). Textbook broke: Textbook affordability as a social justice issue. *Journal of Interactive Media in Education, 2020(1),* p.3.

Appeal to Students' Ethical Considerations

There are also several ethical issues that students may face when pirating textbooks. Copyright laws are in place to protect the intellectual property of authors and publishers. Textbook piracy violates these laws. When it involves taking and using another person's work without their consent, piracy can be viewed as theft (Hati et al., 2020). When students acquire these textbooks online for free, they are aware that it is illegal but also aware that there is little to no chance of any repercussion to them. So, it comes down to the ethical issues. But when students weigh the ethical issues with the high costs of textbooks, which can often have significant impact on their financial situation, the lure of the free textbook outweighs any ethical concerns they may have (Lakkaraju, 2022).

Students who engage in piracy contribute to a greater culture of unethical behavior. This can continue a cycle of dishonesty and ultimately have detrimental effects on both students which they may carry into other areas of their lives and society as a whole (Hati et al., 2020).

Textbook piracy can hurt the publishing industry by reducing the profits made from textbook sales. This can cause a decline in investment in the research and development of educational materials. It is essential that students understand that piracy is not a victimless crime. Publishers and authors devote significant time and money to creating and producing textbooks. They rely on textbook revenues to finance their work. When students pirate textbooks, they essentially take and use this work without permission, which can have major consequences for the authors of these textbooks (Davis & Bialik, 2020).

However, even with these looming legal and ethical issues, students continue to pirate textbooks. Students of this generation are comfortable with downloading illegal material, such as music and movies, so it is no surprise that this age group continues to resort to textbook piracy.

From the latest Internet piracy statistics, it seems this generation is taking piracy to new levels of popularity. Textbook piracy is just seen as an extension of this. They have never been punished before, so they do not fear any negative ramifications.

THE DANGERS OF TEXTBOOK PIRACY

There are some dangers to downloading pirated textbooks. Recent research by Kaspersky Labs demonstrates that many illegally acquired pirated textbooks include viruses. During the 2021 academic year, 356,000 incidents (Spajic, 2023) were detected in which a user downloaded an infected digital textbook (Spajic, 2023). Kaspersky classified the types of viruses included with pirated textbooks. The most frequently found virus was the Stalk worm, which spreads via USB flash drives and the local network and is frequently the forerunner to a more severe attack. Although Stalk does not exhibit any immediately dangerous behavior, it can facilitate the deployment of further malware by an attacker (Spajic, 2023). Consumers who download pirated textbooks are 28 times more likely to get their device infected with malware or viruses (Spajic 2023). If students are compelled to use illegal sources to find textbooks, they should exercise caution.

Textbook piracy falls under the same legal category as legally downloading copyrighted movies or music. Many of the offers for pirated textbooks are phishing scams, asking for credit card information from gullible victims before allowing them to access the free copy (Powell et al., 2021). Many sites advertise VPNs for the user to purchase to make sure the download is secure, thus another way to extort money from those looking for free textbooks.

Websites that offer pirated textbooks are often not legitimate, as they participate in illicit duplication, sharing, or distribution of copyrighted goods. Downloading pirated textbooks through these websites is a breach of copyright law and may have legal and ethical consequences.

Pirated textbooks may contain errors, omissions, or out-of-date content, which can have a severe impact on the learning and performance of students. The use of pirated textbooks may also restrict students' access to supplementary resources, such as online study aids, discussion forums, and teacher support, which are frequently included in authentic textbooks.

Copyright infringement, which textbook piracy falls under, is illegal and can result in fines ranging from $750 to $30,000 (Lakkaraju, 2022). Textbook piracy is illegal and can have serious repercussions, such as criminal prosecution, academic sanctions, and ethical implications. Downloading unlicensed content can also expose students to malware and other security

threats. Students who choose to do this should be very diligent to ensure they are not exposed to these risks.

RESULTS

The result from the study will be presented below, showing student comments, faculty comments, and finally publisher comments. The first results come from students' comments with their experiences with issues that face them and their experience with textbook piracy. Regarding the high costs of textbooks, students made various comments about their experiences with textbook piracy. Textbook prices are a large contributor to textbook piracy. (Weisbaum, 2016).

Student Comments

Textbook costs seemed to be one of the prevailing themes.

Student Comment
The price of textbooks has gotten out of hand and as a result of this, I prefer to download books for free online. The benefits of downloading books include the convenience and affordability.

The following student expresses frustration with the cost of textbooks at the bookstore, so purchasing from online sites such as Amazon gave some cost relief. Renting textbooks was also more cost effective. However, once a site that offer free textbooks was found, that became the method of choice.

Student Comment
The price of textbooks has always been super expensive; my first semester of college I noticed how outrageous the prices were for textbooks in the bookstore, so I purchased my textbooks from different websites like Amazon. Renting or purchasing textbooks I needed for class wasn't even half the price the textbooks were in the bookstore. The purchase of textbooks became a huge weight I got to lift off my shoulders, especially when I came across a website that provided free textbook pdf versions online. The website was super resourceful and came in handy for different classes that I took. For the classes I couldn't find I would stick to Amazon or another website where I am able to rent the book; till this day I still use the free textbook online for my graduate classes.

As previously mentioned, (Lederman, 2018), students may have to choose between food or textbooks. The following student express this concern.

Student Comment
I have had to choose books over a meal plan.

A big concern was that the textbook that was listed in the bookstore or on the faculty member's syllabus may not be necessary (Koenig, 2019), therefore students wait to purchase the textbook after the first day of class. While professors may want students to show up to class on the first day with their books (Nemec, 2020), this frustrates the students, uncertain about which professors will use the textbook or not. Students are concerned about their grades if they do not have the required textbook. This has given way to more textbook piracy.

Student Comment
[One of my professors] requires that we show up to class on the first day with our textbook or we will be penalized. I don't think that's fair because we have all experienced times when we didn't need the textbooks. I always showed up on the first day to hear what the professor says about the book and if we need to buy it or not. Sometimes a professor says it's ok to buy a previous version which is usually much cheaper. I don't want to spend $200 if I'm not going to use the book.

Discovering textbooks are required but not used for class has led to student frustration.

Student Comment
Finally, after all these years we are finally heard. Textbooks are outrageously priced. Only purchased to sit on the desk. I have taken so many classes where we didn't even open the textbook. Everything we needed was all there in the PowerPoint or lecture.

The next students have experience with purchasing textbooks that are rarely used. Because of this, students sought online free solutions they felt were easily found.

Student Comment
I have a website where you just input the title/ISBN and the book will be pulled up. I feel justified because I am already paying double the tuition with no textbooks included. Every year we have to purchase a new textbook and they are rarely ever used. Most of the information in the books is online anyways for the most part so why would I pay so much for something I could get for free?

Although students originally purchase their textbooks when they initially enter college, they find more cost-effective solutions with textbook piracy.

Student Comment
This was one of the issues I have faced during my time in school I started out buying books for every class and it financially drained me, so I switched to downloading my books for class online and it feels like a financial burden lifted off me. *There were times in my first year where I purchased or rented books I never used, so I have used other alternatives like downloading the book from an online source, or simply taking pictures of someone else's books when I couldn't find a free version. The price of books has gotten astronomical over the years. When I began graduate school, my professor recommended a site called vitalsource.com to find cost effective books online. This was something I found relieving, but wished I knew about it sooner. With other expenses hanging over the heads of many students, there is no question as to why finding PDFs or other free discounted options is a better route financially.* *I am grateful for the Internet and search engines. It has been a game changer and allowed me to relieve some of the financial burdens of being a student.*

While all textbooks may not be found online for free, students with the right technological expertise can be very successful in finding the free textbooks.

Student Comment
The benefit of being a student in the age of the Internet is having resources to find alternatives. There are several websites that offer textbook pdfs for free. As a resourceful student, I currently leverage this approach whenever I begin a new course. Before buying it out right, I always search Google for an available .pdf, and have been relatively successful taking this approach. It has saved me hundreds.

Student Comment
I have used this technique before I buy a book for a course. 8/10 I will find a pdf version online

Z-Library was a popular website for downloading pirated textbooks (Woodcock, 2022). This is just one of the resources that are available to students.

Student Comment
I can download the purchased books from Z-library without payment in pdf files and collect the information I need. It has made things easy for me. It seems unfair for students - who are already financially limited to incur additional costs and pay thousands of dollars on top of tuition. Online libraries are a very good source of information, and it makes sure to reduce the challenges for students and smoothen their lives. I prefer the pdf version of the books rather than paying a lot for them.

Student Comment
Guys, if you haven't seen this before, you need to! Why spend $500+ on textbooks each semester when you can download them for free? The textbook industry has been screwing us, now it's time for us to screw them. These sites will potentially save you HUNDREDS on your books! I have found PDF downloads of 75% of the books I needed. Enjoy!

Reddit is another popular site for downloading textbooks.

Student Comments
By checking online, I discovered at times there are free PDF's available for downloads, but if you were to buy the same text from the bookstore it costs arms and a leg. Reddit is a good tool in help looking for textbooks, often you will find others who were seeking the same textbooks and what website they used to get it.

While there are many sites available to download pirated textbooks, sometimes it takes no more than a simple Google search.

Student Comment
Whenever I am searching for a .PDF of a book, I usually start with googling the ISBN and seeing the results that pop up. Its hit or miss for the most part, but I have been able to find some books for some of my classes.

When students find these .pdf books or sites that provide free textbooks, they are likely to share it with other students.

Student Comment
I can totally agree with you about the relief I felt when I gained access to a site that allowed me to download PDFs for the required text. Literally as soon as I was given the site, I sent it to everyone that I knew in college or attending school. It has been a huge help and I always feel a sigh of relief when I find books that I need on the site

There are potential dangers and ethical issues concerning textbook piracy. Pirating someone else's work is considered theft (Hati et al, 2020). Students are aware that downloading pirated textbooks is illegal, but they don't feel threatened by any potential punishment, nor do they have any ethical concerns (Lakkaraju, 2022).

Student Comment
Downloading textbooks for free can be considered illegal as they are still under copyright. But I consider it like this. The Internet is said to be a place where information can be accessed easily and if someone else has taken the opportunity to make textbooks easily available for free I definitely can't complain and I would go with the best and cheapest option available to me.

Other potential dangers include downloading textbook from sites that could infect the students' computer with malware and/or viruses (Spajic, 2023).

Student Comment
There are also websites that you can indeed download the PDF file and use it just like that. The website might be sketchy but it gets the job done.

Faculty Comments

Faculty members were also interviewed to get their feedback. While getting comments from faculty members, they also understand that the prices of textbooks are unreasonable.

Faculty Comment
Maybe the textbook publishers deserve this. They have been fleecing students for years.

Students from lower-income schools feel the costs pressure even more. This study was conducted at an HBCU

Faculty Comment
I teach at an HBCU, so our students come from different backgrounds than students at other universities. Budgets are tight and many of them are working one or more jobs just to pay for school. We have many who are single parents. If there is a way for them to save some money, I'm all for it (pirating textbooks).

Faculty members even admitted to making their students aware of these free textbook options.

Faculty Comment
I have told my students that there is a free version of the textbook we are using for this class available online. I don't actually give them the link but they all know how to use Google.

Using open-source textbooks are available to students at not costs. Many faculty are aware of, and use, open-source material, which takes financial burden off their students.

Faculty Comment
If faculty would start using more open-source material, then this wouldn't be a problem. There are a lot of good choices in open source. I use it for my class…and it's free

One faculty member acknowledges the efforts put in by textbook authors and that they should be rewarded for their efforts. The faculty member believed that textbook rentals could reduced textbook piracy while still giving credit and monetary returns to the authors.

Faculty Comment
Many academics spend a lot of time writing textbooks, which include exercises, exams, and other useful information. They deserve to be paid for their work. The prices do tend to be high, so it would be good if they could be delivered in a less expensive manner. Many publishers are allowing students to rent textbooks at a much cheaper price. I know this has helped many of my students.

When students consider the ethical issues with textbook costs, the lure of the free textbook can overcome ethical considerations they may have (Lakkaraju, 2022). Ultimately faculty member believed that it was up to the student to make the decision to pirate textbooks even though there are ethical considerations.

Faculty Comment
Our students understand the ethical issues and the risks associated with downloading stuff from the Internet. I'm not their priest, I'm their teacher. It's up to them what they choose to do.

One faculty member referred back to the days when Napster was popular with the illegal downloading of music, implying that students have been pirating material for a while so textbook piracy is just an obvious step for them.

Faculty Comments
With the prices of textbooks, I'm surprised it has taken this long for students to start doing this. They have been downloading music for years. I remember Napster.

Faculty members believed that many students are tech savvy enough to find pirated textbooks.

Faculty Comment
Today's students are more tech savvy, so I think many of them have already figured it out.

Faculty Comment
It's only going to get worse. Students will figure it out and it will snowball. The textbook publishers should be worried.

After learning about textbook piracy, two faculty members were more than willing to inform their students.

Faculty Comment
I'm all for telling my students!

Faculty Comment
I've been teaching here for over 20 years, and I have seen the struggles that students have with paying for school. Textbook prices are outrageous. I always try to use older versions, so the books aren't as expensive. But students still come to my office crying about their financial situation. I have personally bought textbooks for students out of my own pocket. Now that I know students can get their books for free, you're damn right I'm going to tell them.

Publishers' Comments

Students have the option of keeping or reselling second-hand textbooks when they have completed a course, however digital products offered by Cengage, Pearson, McGraw-Hill and other textbook publishers are rented and the license expire after a defined term. This renders the textbook useless at the end of the rental period. This software cannot be duplicated by students so they must purchase the license from the textbook publisher. Students are required to purchase access codes to have access to the material they need to complete homework assignments for their classes. This is a method that publishers have started to use to combat textbook piracy.

Publisher Comment
We are starting to use products with access codes more often. This forces the students to purchase the code to do the work for the class. We have really been pushing this method which can ultimately help us reduce the textbook piracy we are seeing in the industry. It seems like other book sellers have also caught on. Access codes are the future of textbooks.

Several textbook publishers have adjusted their pricing policies to make textbooks more affordable for students. This involves giving cheaper e-book editions of textbooks as well as textbook rentals. Some textbook publishers have cooperated with educators and institutions to produce customized resources for students. This may involve the creation of open educational resources or digital textbooks that are less prone to piracy. To stop the circulation of pirated textbooks, publishers have also taken legal action against pirate websites and even individuals.

Some textbook publishers have focused on education and awareness efforts to inform students and teachers of the potential legal and ethical implications of textbook piracy. This may mean providing information about copyright laws and encouraging the use of legal sources for textbooks. Students who engage in textbook piracy may face legal action and academic punishments. In addition to these effects, students should also be aware of the number of risks involved with textbook piracy.

Publisher Comment
We are trying to work with the universities to get them to purchase university licenses for our products. By selling such a large amount we would be able to significantly reduce the cost of the access codes and universities could include the lower costs in the students' tuition with very little impact. Students wouldn't even notice a $50 or $60 increase in their tuition. Then they would have unlimited access to all the courses we offer at no cost to them. We think it's a win-win situation for universities and students.

CONCLUSION

No one can predict the future of textbook piracy. The growth of textbook piracy may lead to a greater emphasis on open-source options. Open Source can provide a cost-effective and flexible alternative to traditional textbooks, and educators and students may use them more frequently to avoid the legal and ethical consequences of piracy. Publishers moving more toward a model that requires access codes will eliminate pirating for their products.

Increased efforts to prevent textbook piracy, including legal action against pirating websites may have an impact, however this has been tried in the music and movie industry with little success. Once one site is taken down, it re-opens under another name. Greater awareness and emphasis on the ethical and legal use of textbooks can result in a heightened awareness. As sites that provide pirated textbooks become more detectable and the Fed starts to crack down more, many move to the dark web, where it is difficult for anyone to track, making the books readily available to students (Woodcock, 2020).

Although progress has been slow, the federal government has recently made efforts to curb the rising cost of textbooks. The following represents some of the key strategies the government is using to address the issue.

The Higher Education Opportunity Act (HEOA), which became law in 2008, prohibits publishers from bundling textbooks with other materials unless they are completely essential for the course and requires that publishers disclose textbook costs to universities. In the interest of helping students make educated judgments about their textbook purchases, the law also requires that schools and universities provide details on the necessary texts in course schedules (Hinojosa, 2020).

The Affordable College Textbook Act would give grant funding to encourage the creation and use of open educational resources and other low-cost alternatives for textbooks. This would mark a possible step toward making instructional resources more accessible and inexpensive for students (Hinojosa, 2020)

Educators, publishers, and legislators are collaborating to create new and inventive methods to make educational resources available, while ensuring that charges are acceptable and equitable. Open educational materials, subsidies, and tax credits can help make higher education cheaper and more accessible to all students.

Publishers may have to consider reducing the price of textbooks to make them more affordable for students. This could decrease the motivation for students to pirate textbooks, but pirating textbooks for free would still be the most economical option. The government could strengthen copyright laws and enforcement mechanisms. Copyright laws should be updated to keep up with the advancements in technology. Additionally, copyright laws should be enforced strictly to deter students from engaging in piracy. Educational institutions should also increase awareness of copyright laws and their implications to encourage students to respect intellectual property rights. Publishers should also consider providing free or discounted access to supplementary materials to students who lawfully purchase or access their textbooks. This can improve the value of textbooks and reduce the motivation for students to engage in textbook piracy.

It is possible that textbook piracy will continue to grow as long as textbook costs remain high. With the growth of digital technology, sharing and accessing pirated information has become easier than ever. This trend will undoubtedly continue to grow as new technologies and ways to share textbooks emerge. Even if the cost of textbooks decreases, the costs will still not be lower than the free textbooks that are available online. It has been suggested that the cost of textbooks be including in the cost of tuition. This would be a way to prevent textbook piracy.

The study shown in this paper merely provides a snapshot of the current level of textbook piracy and cannot accurately predict its future growth. It is essential for educators, publishers, and students to continue working to find new and inventive ways to make educational materials available while obeying copyright laws and upholding ethical and legal behavior.

Many faculty members are also concerned and frustrated with the high price of textbooks. They often see students coming to class unprepared without textbooks, realizing the reason is that they cannot afford the textbook for the class. But what are they to do? To complete the course the textbook is required, so their hands are tied.

In conclusion, to show the extent of textbook piracy at our university, every syllabus of every faculty in the business school was reviewed. Thirty faculty members use textbooks in their courses. All 30 of the textbooks were available online for free download. One course that stood out required 3 different textbooks which would cost the students over $500 if purchased at the university bookstore (which many students must do to use their financial aid). As faculty members we must realize the high costs of textbooks are a problem for many students and we should look for alternative ways to help our students, such as investigating open-source textbooks. Students' financial situations are different, and as faculty we have little to no way of knowing which students are struggling financially. School is stressful enough without having to worry if you must choose between textbooks or a meal plan. Textbook piracy is illegal and unethical. As faculty it is our duty to steer our students in the right moral direction, but as human beings who see the suffering of our students, we ourselves are faced with an ethical dilemma.

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ACADEMIC DISHONESTY OF TAIWANESE UNIVERSITY STUDENTS

Thomas Gwinner, Chien Hsin University of Science and Technology Zhongli, Taiwan
Marty Ludlum, University of Central Oklahoma
Ashley Wiltz, University of Central Oklahoma
Josue Carreno University of Central Oklahoma

ABSTRACT

Academic dishonesty (AD) is a global plague. This study examines an understudied population, Taiwanese college students from Zhongli, Taiwan (n=603). We used two scales, student attitudes towards academic dishonesty and one measuring the frequency of those behaviors. Both were found to be reliable. Defining AD is key to getting a complete understanding of the concept. We found self-reported academic dishonesty behaviors prevalent both in exam cheating and plagiarism. When we expanded the definition of AD to include homework assignments, we found cheating to be near universal. We conclude the paper with limitations and a call for further research.

Key words: *academic cheating, plagiarism, survey, college student, Taiwan*

INTRODUCTION

Academic cheating is a global problem (Orok et al, 2023), but its importance extends beyond the classroom. College students are the future workforce and leaders in society (McCabe, Butterfield, & Trevino, 2006; Lin & Wen, 2007). Their unethical behaviors now could be problems for the future. Based on current research, we should be worried. Cheating on campus is rampant. Brown & Choong (2005) found that 95.9% of private U.S. university students and 96.7% of public U.S. university students had admitted at least one dishonest practice. While some findings have lower percentages, depending on how you define dishonest acts, the results are staggering.

While the American college campus has been thoroughly examined, much of the world has not. Taiwan is underexamined on academic dishonesty (Ludlum, et al., 2019; Iberahim et al., 2013). In the current project, we surveyed Taiwanese college students on academic cheating. To support this analysis, we will first review the relevant literature.

Next, we will examine the survey methods. Then, we will discuss the findings. We conclude by suggesting further research in this area.

REVIEW OF THE LITERATURE

We know a great deal about academic dishonesty, and the results are quite dire. In this project, we use the terms academic dishonesty and cheating interchangeably. We rely on the heavily examined American college population. In the classic study, Bowers (1964) surveyed over 5000 students across 99 US campuses and found 66% of students had cheated at least once. More recently, McCabe and his co-authors examined multiple large groups on AD. McCabe (1997) surveyed 16 campuses to compare business and engineering students and found that 84% of business students and 72% of engineering students admitted to cheating within the last year. McCabe, Butterfield, & Trevino (2006) surveyed over 5000 students from 32 colleges and found 56% of business students and 47% of non-business students admitted to cheating at least once during the last year. McCabe, Trevino, & Butterfield (2001) reported on a variety of contexts, including differences of major, emphasis or lack of honor codes, and numerous individual factors, always with a similar result: most college students cheat.

Individual factors have been correlated with academic dishonesty. Age matters. Older students are less likely to commit academic dishonesty (Kisamore et al, 2007; Olafson et al, 2013; McCabe & Trevino, 1997; Klein et al, 2007; Landa-Blanco et al, 2020). Consistent with this finding, the year in school also matters. First year college students are more likely to cheat than upperclassmen (Adama et al 2023).

One factor that gathers a great deal of attention is gender. Most studies (but not all) have found that males commit AD more than females (Hensley et al, 2013; Bowers, 1964; McCabe & Trevino, 1997; Whitley, Nelson, & Jones, 1999). However, within the same major, gender differences are more modest (McCabe, Trevino, & Butterfield, 2001).

Religion should be an important factor in AD, as ethics are often grounded in religion. However, the method of reporting has resulted in mixed results. Religious identity (which denomination a student chooses) has little effect on AD (Yu et al, 2017; Huelsman et al, 2006; Bruggeman & Hart, 1996). This does not mean religion is immaterial. Choosing one religion from a list of many does not significantly affect AD. However, religious attendance / participation is positively correlated to academic honesty (Bloodgood et al, 2008; Burton, Talpade, & Haynes, 2011, Rettinger & Jordan, 2005). In addition, more intense religious feelings (regardless of denomination) were tied to more self-reported academic honesty (Rettinger & Jordan, 2005).

In addition to individual characteristics, international comparisons are important as ethical standards vary with culture (Lin, 1999). There are strong differences in how people from the East and West see academic dishonesty (Thomas, 2017). In the current project, Taiwan's culture is heavily influenced by Confucian doctrine (Lin, 1999), making a direct comparison to USA results difficult.

In contrast to American and Western European students, the literature on Taiwanese undergraduates and academic dishonesty is limited. Lin & Wen (2006) completed a national study of undergraduates (n=2068) in Taiwan. They used a scale of 17 cheating behaviors divided into four areas of academic dishonesty, including cheating on tests, cheating

on assignments, and plagiarism. Lin & Wen (2006) found that 61% of Taiwanese students admitted to cheating. Further, they found that the top five most practiced academic dishonesty behaviors in Taiwan were providing an assignment for another student, giving prohibited help to others on their assignment, copying others' assignments, passing answers to other students, and copying answers from other students. They also concluded that female students were more honest, and first year students were more dishonest.

Hsiao (2015) compared undergraduate students in Taiwan (n=525) and compared their unethical conduct and the cheating intentions while controlling for work experience. They concluded the anticipated negative affect appears to be stronger than positive effect on cheating intention. Hsiao (2015) found significant determinants of cheating intention are quite different in the part-time job and full-time job student groups. Hsiao did not analyze other demographic groups.

Hsiao & Yang (2011) surveyed Taiwanese business undergraduate students with a full-time job (n=215). They restricted the concept of academic dishonesty to traditional forms of cheating on exams. They concluded that the students' ethical behavior was influenced by peer behavior. Furthermore, a lack of penalties for cheating behavior may also provide excuses for students to interpret their cheating behaviors as insignificant. They did not examine students by age, gender, or occupation.

Yang, Huang, & Chen (2013) investigated undergraduate students in Taiwan (n=431) using the Academic Dishonesty Scale (ADS) which included plagiarism, cheating on exams, improper cooperation, and tampering with grades. They found social science students cheated more than business or engineering students. They also discovered that students, regardless of gender or major, were significantly more willing to report classmates than friends. In addition, they found that male students reported a slightly higher level of involvement in three types of misconduct.

Ludlum & Gwinner (2016) examined undergraduate business students in Taiwan (n=1410). They found that 30% claimed to have never seen a student cheat on an exam, however 33% claimed it happened frequently. When asked about reporting another student, 60% claimed he/she would never report another student cheating. Less than 4% indicated would always report a student cheating. These findings indicate that cheating incidents are likely under detected.

Yang (2012) examined graduate students in Taiwan (n=586) using a 26-item Academic Dishonesty Scale (ADS) related to publishing academic papers and plagiarism. Yang (2012) found the fraudulence subscale ranked the highest in terms of perceived frequency, followed by plagiarism, falsification, and delinquency. Yang (2012) also found that master's students participated in more academic dishonesty than doctoral students, that males assumed more students committed bad behaviors, and that females were more critical of those behaviors. This result cannot be compared to the current study since those behaviors (ranking of authors on a published paper, etc.) have little application to the undergraduate experience.

The current project's first goal is to build on this knowledge of the understudied Taiwanese student population. Also missing in current research is an examination of the individual characteristics (age, gender, religion, and employment) for differences in academic dishonesty, especially among undergraduates. This paper's second goal is to fill that void. This

project will examine two broad research questions. First, is academic cheating common in Taiwan? Second, do individual factors affect students' attitudes towards academic cheating?

METHOD FOR THE SURVEY PARTICIPANTS

The participants were from Chien Hsin University of Science and Technology in Zhongli, Taiwan. The university has over 13,000 students in five colleges with seventeen

(17) degree programs (Chien Hsin, 2023). Our survey included a sample of students (n=603) by first finding professors who volunteered their students (and class time) to participate in this project. We attempted to include all business majors, our intended study group.

Table 1. Demographic data of sample

Major	Business 67%	Non-Business 33%		
Year in School	First 47.3%	Second 28.2%	Third 14.1%	Fourth 10.3%
Gender	Males 57%	Females 43%		
Relationship	Married 3%	Single 97%	Has children 2%	
Religion	Non-Religious 47%	Taiwan Folk Religion 25%	All others 28%	
Employed	Part time 50%	Unemployed 50%		
Parents' education	Legacy student 37%	First generation student 63%	Military experience 7%	
Taken business ethics course	Yes 56%	No 44%		

Underclassmen were underrepresented in our sample. Males outnumbered females 57% to 43%. Our group consisted of primarily traditional students (95% were aged 18-22).

Only 15 students (3% of the respondents) were married, and only 11 (2%) students had children. Half of the students (50%) worked part time while attending school. Taiwanese Folk Religion was the dominant group with 25%, while 47% identified as non-religious. Other students were spread among other faiths. Nearly all students (83%) reported going to a church service less than once a month, and only 4% identified with being "strongly religious." The majority of students (63%) were the first in their family to attend college. Only 7% had military experience. Over half (56%) had taken a business ethics course.

PROCEDURES

A convenience sample was taken from large, introductory classes at Chien Hsin University in Zhongli, Taiwan during a series of guest lectures in the spring of 2019. To avoid language/translation issues, the bi-lingual survey was conducted simultaneously in English and Mandarin Chinese. The students at Chien Hsin are multilingual (Mandarin and English), with several programs taught in English to benefit their international exchange programs. Most foreign teachers in Taiwan are English speakers (Chang, Bai, and Wang, 2014). The Mandarin translation was accomplished by one of the authors, who is a language professor, and the translation was pilot studied before implementation.

Students were asked to complete the questionnaire during class time. The survey was voluntary and anonymous. No inducements were offered to the students to participate. A total of 603 surveys resulted. Some surveys were returned blank, but the exact number of these were not retained. We would estimate a return rate of approximately 90% or higher. The text of the questions is included in the tables.

MEASURES

We used two measures for academic integrity. First, we replicated the 18 item Attitudes Toward Cheating (ATC) scale from Simha, Armstrong, & Albert (2012). These items used a three-level scale, Not Cheating, Trivial Cheating, and Serious Cheating. Second, we replicated the 18 item Frequency of Cheating (FOC) scale from Simha, Armstrong, & Albert (2012) which put the same behaviors of ATC into first-person and past tense ("I did ___"). For the FOC, we used a five-level scale, Never, Rarely, Sometimes, Many times, and Always. The scales were reliable with an American student sample. Simha, et al., (2012) found that business students had more lax attitudes toward cheating and cheated more often than leadership students. This project is the first known use of the ATC and FOC scales on a Taiwanese sample.

The project appeared to have face and content validity. As a test for internal consistency, we conducted Cronbach's alpha for our two scales. Our first construct, Attitudes Toward Cheating resulted in an alpha of .947 for the 18-item scale. Our second construct, Frequency of Cheating resulted in an alpha of .938 for the 18-item scale. We used SPSS version 24 for analysis.

FINDINGS AND DISCUSSION

We were best able to minimize the socially appropriate response bias by using a large group survey, anonymous results, and confidential submissions. We begin by first looking at the overall results of our two constructs, Attitudes Toward Cheating (ATC) and Frequency of Cheating (FOC). We started with an original sample size of 603. See the complete results below in Table 2. Note that ATC9 is missing. One of the demographic questions was inserted in that spot to break up the pattern.

Table 2. Attitudes Toward Cheating Results.

Attitude Towards Cheating Questions (n = 603)	Not Cheating	Trivial Cheating	Serious Cheating
ATC1.Copying homework assignments from others	26	59.1	14.9
ATC2.Allowing others to copy homework assignments from you	26.1	56.5	17.4
ATC3.Collaborating with others on assignments meant to be completed alone	42.7	45.2	12.1
ATC4.Collaborating with others on tests meant to be completed alone	33.1	39.6	27.3
ATC5.Using unauthorized cheat-sheets on an exam	32.4	28	39.6
ATC6.Looking at or copying from other's exam copies	30.9	28.3	40.8
ATC7.Allowing others to look at or copy from your exam copy	27.4	38.7	33.9
ATC8.Obtaining exam questions illicitly beforehand	38.8	15.7	45.5
ATC10.Using unauthorized electronic equipment for use in exams	35.4	31	33.6
ATC11.Fabricating bibliographies on assignments/papers	38	31.7	30.2
ATC12.Copying from a source without citing the source	31.4	38.5	30.1
ATC13.Obtaining papers from the web and turning them in as your own work	36.2	19.4	44.4
ATC14.Making others write your papers for you, and then turning them in as your own work	38.6	22.7	38.6
ATC15.Referencing materials without reading them	37.3	44.8	18
ATC16.Falsifying grade scores	37.8	11.5	50.7
ATC17.Changing one's answers after getting the grade in order to increase one's score	35.9	17.5	46.5
ATC18.Making false and fraudulent excuses to postpone assignments and/or tests	31.8	37.8	30.2
ATC19.Falsifying school documents	39.1	13.1	47.4

Overall, with the ATC, we found that Taiwanese students do not view homework violations (ATC1-2-3) or failing to cite references (ATC15) as serious cheating. Bad behaviors while taking an exam (ATC4-5-6-7-8) and making false excuses to avoid assignments (ATC18) were viewed as more serious. The students viewed the most serious infractions as falsifying scores (ATC16-17) and providing false documents to the school (ATC19).

Table 3. Frequency of Cheating means.

Frequency of Cheating Questions (n = 603)	Mean
FOC1.I have copied homework assignments from others	2.50
FOC2.I have allowed others to copy homework assignments from you	2.81
FOC3.I have collaborated with others on assignments meant to be completed alone	2.74
FOC4.I have collaborated with others on tests meant to be completed alone	2.43
FOC6.I have used unauthorized cheat-sheets on an exam	2.04
FOC7.I have looked at or copied from other's exam copies	1.99
FOC8.I have allowed others to look at or copy from your exam copy	2.25
FOC9.I have obtained exam questions illicitly beforehand	1.55
FOC10.I have used unauthorized electronic equipment for use in exams	1.57
FOC11.I have fabricated a bibliography	1.50
FOC12.I have copied information from a source without citing the source	1.70
FOC13.I have obtained a research paper from the web and handed the paper in as my own	1.46
FOC14.I have had others write my research paper for me, and then handed in the paper as my own	1.48
FOC15.I have referenced materials without reading them	1.83
FOC16.I have falsified grade scores	1.49
FOC17.I have changed test or assignment answers after getting my grade score	1.46
FOC18.I have made false and fraudulent excuses to postpone assignments or tests	1.58
FOC19.I have falsified school documents (i.e., parking permit, certificate, doctor notes etc.)	1.36

The scale used to capture the Frequency of Cheating behaviors was a 5-point Likert-type scale ranging from 1 (never) to 5 (always). A higher mean indicates the behavior was more common. The most common behaviors in our sample were reported as homework and collaboration infractions (FOC1-2-3-4) and allowing another person to copy from your exam (FOC8). We were not surprised to find that the behaviors viewed as minor infractions (homework and collaboration) were also those that happened most frequently. We were surprised, however, to find that letting another person copy from your exam (FOC8) happens frequently, as students considered this a serious infraction.

The behaviors reported as occurring the least often were plagiarized papers (FOC14), falsified scores (FOC16-17), and falsified school documents (FOC19). These behaviors were rated as the most unethical in the ATC. This was a positive sign. The behaviors that were viewed as most unethical were occurring the least.

Overall, the amount of cheating was dismal. Serious exam cheating at least once any time in college (FOC 5, 6, 8, & 10) was self-reported by 70.6% of Taiwanese students. Serious plagiarism at least once any time in college (FOC 11, 12, 13, & 14) was self- reported by over half (51%) of our sample of students. When we expanded the scope of AD to include minor cheating (like homework), the results were shockingly bad. Only 2.82% of students claim to have never cheated in any way at any time in college. When we expanded the concept to never cheated or only cheated once, only 4.81% of the students were cleared. While bad, these results

are in line with studies from other nations (see Bowers, 1964; McCabe, Butterfield, & Trevino, 2006; Orok et al, 2023) and previous studies in Taiwan (Lin & Wen, 2006). Cheating is frequent, common, omnipresent, with the only differences being how AD is defined. These findings support the conclusion that widespread academic cheating is a global phenomenon.

IMPLICATIONS FOR FUTHER RESEARCH

All survey projects have limitations. Academic dishonesty research is sensitive, and it is difficult to control for the social desirability bias (McCabe, Trevino, & Butterfield, 2002) despite our best efforts. Second, the results relied on self-reported data from the students. Self-reported data were not confirmed by any other means. Self-reported data always has problems of generalization and reliability. However, with student privacy concerns, as well as the content of the survey (unethical behaviors) anonymous surveys were the only possibility. Another limitation was that we only examined one institution. This school might not be representative of all Taiwanese universities. In addition, most were business students, however individual sub-disciplines (accounting, finance, economics, management, etc.) were not delineated. Differences in these sub-disciplines could be significant. Other discipline areas (science, math, history, language, etc.) were under-represented. Our sample also did not include graduate students who could have far different views on ethics. In addition, our sample consisted of almost exclusively traditional students (young, unmarried, without children). Future projects should target the non-traditional students as their views should not be assumed to be the same as traditional students. Another limitation of this study is the non-random sample. A random sample could result in more generalization.

CONCLUSION

Is academic cheating common in Taiwan? We can confidently conclude that academic cheating is common in Taiwan, no more and no less than any other nation, and depending on the definition of AD, the offenses can be nearly universal. Academic cheating is assumed to be a global phenomenon, and our findings would support that conclusion.

Future projects should examine more cultures to confirm that academic cheating is a global problem, not just a few isolated countries. In addition, future endeavors should include other parameters to allow for more in-depth statistical analysis. Further, new projects should strive to gain a well-rounded sample to examine subgroups of students (by religion, major, age, marital status, having children, etc.). Finally, any future projects should examine in detail the newest cheating behaviors of students. New technologies are adding new opportunities to cheat while on campus.

AUTHORS

Professor Emeritus Gwinner taught Hospitality Management and Foreign Languages at Chien Hsin University of Science and Technology, retiring in the fall of 2022.

Professor Ludlum is a Professor of Legal Studies at the University of Central Oklahoma. He can be reached at mludlum@uco.edu (contact author).

Josue Carreno & Ashley Wiltz are undergraduate research assistants from the University of Central Oklahoma.

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EQUIPPING STUDENTS WITH DIGITAL TOOLS FOR E-LEADERSHIP DEVELOPMENT

Kathryn Woods, Austin Peay State University

ABSTRACT

The purpose of this paper is to share strategies and recommendations for the creation of coursework that equips students with digital tools designed to enhance their e-leadership development journeys. Recommendations were created after analyzing an assignment given to students in an online leadership development graduate course. The assignment directs students to develop a "tool" for leadership development as a first step toward curating a larger-scale "e-leadership toolbox" that could serve as a portfolio of resources designed to help them develop and thrive as leaders in a digital environment. The featured assignment for this course directs students to describe how they could create and leverage a virtual board of directors, implement and reflect on personal branding efforts, or find value in e-mentorship strategies. Students use this assignment as an opportunity to apply the course material that relates to strategies used to cultivate accountability in the leadership development process. The assignment encourages students to think critically about course concepts and provides an opportunity to apply the concepts directly to their roles in their current or desired future workplace or industry. Reflecting on the assignment has allowed this researcher to provide recommendations intended to inspire creative ideas and inform curricular best practices in online (and often interdisciplinary) social science programs that seek to prepare students to thrive in technology-mediated work environments.

INTRODUCTION

In 2020, the COVID-19 global pandemic affected organizations worldwide and will no doubt have long-term effects on the way people work and how organizations achieve outcomes. While the rise in popularity of remote work had already precipitated a need for increased emphasis on teaching e-leadership skills in social science programs, the pandemic has created a more urgent demand for excellence in employees' abilities to lead their workforce in digital environments. This urgency has prompted faculty to consider new ways to help students gain an understanding of e-leadership to meet their needs and the needs of their employers. As one Master of Science in Leadership program considers options to help meet those needs in a practical way, we have started to consider the creation of an "e-leadership toolbox" that students could maintain and use as needed throughout their time in the program and beyond.

With a potential long-term goal of creating a program-wide "toolbox" for students, one faculty member has taken a first step toward its creation and potential implementation in a leadership development course. A brief review of the body of literature on both the importance of e-leadership skills and creative approaches to leadership development highlights an

opportunity for educators to urge students to discover and explore digital tools designed for practical use that allow them to apply the course material beyond the classroom. Curricula across leadership-focused graduate programs often contain an element that addresses e-leadership mainly through content focused on virtual team leadership or management. The question explored in this practice is "How can instructors help students in graduate-level leadership development courses develop or refine creative strategies for e-leadership beyond leading virtual teams?" In this paper, the focus is on an assignment designed to help the student increase ownership and accountability for their efforts in leadership development, with an emphasis on e-leadership skills.

REVIEW OF LITERATURE

The Rise of e-Leadership

Avolio et al. (2014) defines e-leadership as "a social influence process embedded in both proximal and distal contexts mediated by advanced information technology that can produce a change in attitudes, feelings, thinking, behavior, and performance" (p. 107). While the formal study of leadership and organizational behavior has been popular for many decades, e-leadership is a relatively new sub-topic of study (Avolio et al., 2000). The rise of telecommuting and online work in modern workplaces continues to bring much attention to this concept as leaders face new challenges in running increasingly remote work environments. Liu et al. (2018) reported that energy (to engage in continuous learning and master relevant technologies) and well-honed analytical skills were among the most important e-leadership skills. Similarly, other researchers identified and organized "…six skill-based competencies that successful e-leaders should aim to master. The competencies are: e-communication, e-social skills, e-team building skills, e-change management, e-technological skills, and e-trustworthiness" (Van Wart et al., 2019, p. 91). Other scholars suggested focusing on the often juxtaposed processes exacerbated by remote work. Purvanova and Kenda (2018) highlighted the need for e-leaders to master the balancing act between opposing behaviors, such as "manage productivity and inspire performance-beyond-expectations, set clear goals and form meaningful relationships, manage the process and encourage individuality and flexibility" (p. 776).

DuBrin (2023) reported that virtual work teams surged during the onset of the COVID-19 pandemic, and that due to the many benefits realized, organizations are increasingly adopting this practice for the long-term. As this trend becomes a sustainable practice for many organizations, the need for e-leadership learning becomes even more time-sensitive. Virtual managers are tasked with crafting and supervising performance benchmarks for remote employees – a process sometimes entirely mediated by technology. DuBrin found that challenges in navigating those processes remotely are often rooted in poor communication and a lack of trust that sometimes plagues virtual workspaces. His research supports engaging in some specific e-leadership skill development activities to provide solutions to e-leadership challenges. These skills include establishing trust through transparent communication, leveraging and appreciating team diversity, and enhancing the visibility of the work of the virtual team.

Leadership educators have incorporated research on successfully leading remote work teams into various courses for many years, but the evolving formal body of literature continues to identify and refine these additional skillsets needed to be a successful e-leader. Academic programs need to be a quick study on this topic in order to revise or develop appropriate curricula that promotes current, relevant skill development. Van Wart et al. (2019) highlighted the intense speed of workplace changes in the digital era, which has obviously outpaced the speed of research in this area. These changes are constantly creating new challenges for both workplace leaders charged with leading effectively via digital channels and academics responsible for managing curricula that will prepare leaders for their responsibilities in the workplace.

Digital Leadership Development

As more organizations allow (or sometimes – in the wake of a global pandemic - mandate) employees to work remotely, e-leadership skills are increasingly emphasized in organizational efforts toward leadership development, even while leaders are scrambling to determine what the exact outcomes of those efforts should be (Byrd, 2019). Graduate programs in the social sciences often include courses in leadership development, which focus on development of the leadership capacity of self and/or others (Stork et al., 2015). The rise of e-work has prompted ongoing questions for leadership educators teaching courses in leadership development, including: How can/should we update curricula or course materials to meet the needs of the modern remote workforce? What should we be teaching that specifically applies to leadership development in a digital environment? (Van Wart et al., 2019)

Industry leaders continue to provide feedback to universities that graduates often lack in soft skills needed to succeed in the workplace (Jaschik, 2015). Researchers have studied many organizations and found that companies that offer specific e-leadership professional development and training opportunities are more prepared to face the challenges present in increasingly global markets (McCann & Kohntopp, 2019). Iordanoglou (2018) reported that as organizations increase their desire to improve leadership development efforts, they must proactively offer such training to employees much earlier than current organizational norms typically provide. She also concluded that leadership development efforts "should start with personal dream and vision, involve peer to peer coaching and coaching with compassion, and establish close and caring relationships…" (p. 127). Jenkins (2018) provided a more narrow suggestion by listing important themes for online leadership development courses, including "self-understanding, action learning, interaction, contextual, knowledge evaluations, follow-up, mentorships, and self-advancement" (p. 72). While the content for effective modern e-leadership development in organizations is clearly evolving rapidly, academic programs can benefit from these insights as we equip our students with appropriate skills in this area.

Byrd (2019) articulated some of the challenges of honing and delivering leadership development content in an online environment. She found that organizations can overcome some of those challenges by delivering information via "virtual action learning" due to its heavy emphasis on leaders building and maintaining relationships. An amplified cognizance of the

challenges organizations face as they work to identify the desired competencies and objectives for training - in addition to the ideal methods of delivery for that training - has moved this issue toward the spotlight in leadership education.

Developing an e-Leadership Toolbox

The increasing prominence and importance of e-leadership skills in organizations sparked the idea of incorporating the concept throughout the curriculum of our Master of Science in Leadership program. Many of our course learning outcomes focus on preparing students to understand organizational dynamics and to appreciate and be prepared for leadership roles in their organizations. At present, we must consider that many of these organizations can and will accomplish their work virtually.

Graduate-level students expect to gain practical knowledge and skills, and a virtual "toolbox" is one way to help them take that knowledge with them, allowing for convenient recall in the future. Similar to an academic e-portfolio, we are considering the implementation of this "e-leadership toolbox" and using the assignment in the leadership development course as a first step toward directing students to develop a "tool" to include. The aim of the toolbox is to allow students to develop and organize their own tangible e-leadership artifacts that could enhance their ability to turn theory into practice, though we realize that the potential adoption and implementation of such a system would require planning, resources, and buy-in from multiple parties to be effective for students (San Jose, 2017).

The efficacy of e-portfolios in graduate programs has received mixed reviews from educational researchers. Faculty in graduate programs in various disciplines have identified e-portfolios as one way to assess how well students meet program learning objectives. Students reported perceived benefits from compiling their work as the process of creating a portfolio allowed them to more clearly recognize connections between their studies and opportunities to apply their new knowledge in their work environments (Goertzen et al., 2016). Driessen (2017) found that reflective portfolios are often viewed as obligatory and generally unhelpful by both students and educators. However, comprehensive portfolios built throughout the course of a program that contain diverse artifacts are viewed by students as helpful resources after graduation (Driessen, 2017; Kruger et al., 2013; Munday, 2017; Reese & Levy, 2009) and can "help individuals present a more comprehensive professional persona" (Kruger et al., 2013, p. 51). The proposed toolbox in the present case is intended to be an organized, themed repository/portfolio for students to visit and re-visit as they face real-world leadership challenges in the future rather than a tool for assessment. As an academic leadership program, we recognize that appropriate real-world leadership approaches and skills are situational, rather than one-size-fits-all. Our hope is that our graduates would view the e-leadership toolbox as one resource at their disposal as they consider options for addressing challenges with leadership situations that are mediated by technology.

DESCRIPTION OF THE PRACTICE

While pursuing the Master of Science in Leadership program at a regional, public university in the southeastern region of the United States, students can choose to take Leadership Development as an elective course. This program is entirely online and courses are offered in an 8-week accelerated format. The course description states, "This course will provide participants with knowledge regarding effective strategies for leadership development for others and themselves. The course combines theory and research to provide practical examples for creative mentorship strategies and structuring experiences for leadership development." Students engage with content on giving and receiving feedback, cultivating psychological safety in the workplace, mentoring, personal brand management, building trust, and diversity, equity, and inclusion programming. Various strategies for each of these topics are presented, and students complete written assignments in which they apply these strategies to realistic scenarios.

This fully online program has been operating in its current form for about five years. After a change in degree designation and a full curriculum overhaul, the program has seen a rapid increase in enrollment. This program serves a diverse group of students – in terms of demographics, professional background, and level of work experience. To better equip our students to answer the call for leaders to develop e-leadership skills that go beyond addressing the leadership of remote work teams, the "e-leadership toolbox" concept is under preliminary consideration as a whole-program approach. This method would allow students to maintain an organized portfolio of practical assignments that can assist them indefinitely after graduation.

While the ultimate goal is to assess the desirability and feasibility of expanding the toolbox concept program-wide, this paper examines the exploratory implementation of the concept in one specific course. In an effort to create an innovative assignment that is both practical and valuable for students who increasingly find themselves living and working in a mostly-virtual environment, the e-leadership unit within the leadership development course was a natural place to begin this effort.

To best serve the diverse study body, the instructor's goal was to create an assignment students could find valuable no matter their phase of career. After reflecting on the course material and learning objective (practicing strategies to effectively develop self and others as leaders), the instructor decided to build the final course assignment on the concepts of mentoring and personal branding, which are practices that can foster leadership development in a virtual environment (Greene, 2015). Students prepared for this assignment with several readings, including the book *Creative Mentorship and Career-Building Strategies* by Mary Pender Greene (2015). This book provides guidance on many types of mentoring - including peer mentoring, reverse mentoring, and situational mentoring - and realistic examples of effectively engaging in those practices. Additionally, Greene describes and recommends the creation of a Virtual Personal Board of Directors (VPBOD) as a tool for leadership development. She defines the VPBOD as "a group of trusted and respected advisors, corresponding to specific aspects of your professional life" (p. 30). Students are encouraged to fill specific roles on that board, to include Technical Officer, Financial Officer, Ethics and Morals Officer, Political Analyst, and Marketing

and Branding Officer. The goal is for each role applicable to the individual's professional situation to be filled with an appropriate mentor. Students also read peer-reviewed journal articles related to various facets of virtual mentoring (Evans, 2018; Neely et al., 2017) and the importance of leveraging virtual professional networks and personal branding efforts to cultivate leadership opportunities (Gorbatov et al., 2018; Hoppe & Reinelt, 2010; McCallum & O'Connell, 2009; Milovanović, 2015). Personal branding is defined by Gorbatov et al. (2018) as "a strategic process of creating, positioning, and maintaining a positive impression of oneself, based in a unique combination of individual characteristics, which signal a certain promise to the target audience through a differentiated narrative and imagery" (p. 6). Contemporary personal branding efforts are now mostly mediated by technology.

Students taking this course worked toward the learning objective of practicing strategies to effectively develop self and others as leaders. They were prompted throughout the course to study and reflect on mentorship-related practices. Refining these processes equips them with the knowledge to encourage their mentees, followers, or team members to engage in effective mentorship when appropriate. As described below, they were tasked with engaging in an activity for their own self-development now to increase their familiarity with the practice and boost their confidence in the process. The artifact or "tool" created in this assignment was designed and intended to assist students in learning a helpful practice that they could reference throughout their career as they serve as mentors and work to guide leadership development efforts for others. Student instructions for the final assignment were as follows:

Students can choose one of the following three options for this project. Choose the one that you feel will have the most meaning for you personally in your phase of career/leadership development.

Option #1: After reading the assigned text/articles on creating a virtual personal board of directors, write an APA-style essay about *your* virtual personal board of directors. In 4 - 6 pages, provide specific information about a few of the roles/players you would include, how you would build your board, and how you would leverage your board. Be specific in regards to ways your board will help you reach your career goals.

Option #2: After reading the assigned text/articles on personal branding, create a 10 - 15 minute video describing your own personal brand. You can record yourself doing a presentation, or you can narrate a PowerPoint or Prezi presentation and save it as a video file. Include information about how you will build (or have built) your personal brand and how your efforts could help you achieve your specific career goals.

Option #3: After reading the assigned text/articles on types of e-mentors, choose at least two of the types of mentors described. Write a 4 - 6 page APA style essay explaining how you believe you could benefit from being mentored in one of these ways, and how you and a mentee could both benefit from you providing mentorship in one of these ways. (So, in one scenario, you are the mentor, and in the other you are the mentee.) For example, you might feel that you could benefit as a mentee from traditional e-mentorship in a certain area, and that you could provide

effective peer e-mentorship in another area. Be specific in regards to ways both of these e-mentorship experiences could help you reach your career goals.

DISCUSSION OF OUTCOMES/RESULTS

Students were given the option to complete one of the three assignments mentioned above in the 2019, 2020, 2021, and 2022 sections of the leadership development course. Outlined in Table 1 are the total enrollment for each section, and the number and the percentage of students who selected each assignment option.

Table 1.
Student Selection of Projects

		Mentoring		Virtual Personal Board of Directors		Personal Branding	
Year	Enrollment	# of Students	% of Students	# of Students	% of Students	# of Students	% of Students
2019	9	6	66%	3	34%	0	0%
2020	11	5	45%	4	37%	2	18%
2021	7	3	43%	3	43%	1	14%
2022	6	1	17%	4	66%	1	17%

Student work was submitted individually and directly to the instructor through the learning management system. All projects were assessed only by the instructor, using an original grading rubric. Eighty percent of the grade was based on project conceptualization, and twenty percent was evaluated on organization, professionalism, mechanics, etc. Regarding conceptualization, projects were assessed based on several factors, including appropriateness of topic to meet the learning objective (practicing strategies to effectively develop self and others as leaders), thoroughly and accurately applying appropriate information from the readings, and incorporating thoughtful reflection where appropriate (see excerpt from grading rubric in Table 2 below).

Table 2.
Assignment Grading Rubric

Conceptualization. Points Possible: 40 points				
Unacceptable: 0 points	Poor: 1 – 13 points	Fair: 14 – 27 points	Good: 28 – 39 points	Excellent: 40 points
Strategy not appropriate; information not linked to Creative Mentorship text	Strategy not completely appropriate; Covers some of the project and somewhat links to the topics in the text	Appropriate strategy; Covers parts of project and somewhat links to the topics in the text	Appropriate strategy; Covers all items in instructions; highlights/relates to the appropriate information from the text; Some reflection	Appropriate strategy; Thorough; highlights/relates to appropriate information from the text; Thoughtful reflection

After recording and reflecting on observations about the topics addressed in the assignments each year, the instructor identified several interesting themes in student responses to each assignment, as described below.

Option #1: Virtual personal board of directors. Students tended to apply course material here on the importance of building a professional network, leveraging social media and live events to build and maintain a professional network, emphasizing the benefits of diversity among board members, and (when applicable) maintaining a balance of board members that work in their current field and their desired field. Many students who were not yet working in their career full-time were able to identify individuals for their virtual personal board of directors who could be of assistance to them on their journey toward their career path.

Option #2: Personal branding. Students emphasized many important elements of personal branding, including social media presence, taking an online-but-actionable public stance toward social justice, volunteering, community involvement, networking, and professional behaviors.

Option #3: E-mentorship. Most students emphasized the growing importance and convenience of e-mentorship as a tool both to mentor others and to be mentored. While many had not formally studied this practice in an academic setting, most seemed to be familiar with it or have experience with it in some sense. This seems to be quite popular in practice and students were noticeably excited about it as they researched best practices and shared what has (or has not) worked for them in the past, and what formal-but-flexible e-mentorship goals they had in mind for the future.

REFLECTIONS OF THE PRACTITIONER

In the sections of the course taught thus far, students selected the personal branding assignment less than either of the other options. The instructor wondered if this was partially due to the assignment instructions listing the submission method as a video rather than a written document in the 2019 and 2020 sections. In the 2021 and 2022 sections, the instructor allowed the students to choose writing an essay or creating a video for any of the three prompts, since the

objectives could be achieved in either modality for each assignment, but still only 14 % - 17% of students chose that option.

In future terms, the instructor plans to implement updates to the course readings and assignment as the literature and frequency of remote working conditions continue to evolve. The learning objective "practicing strategies to effectively develop self and others as leaders" can be met in multiple ways, and this assignment could be implemented more broadly to allow students to apply the material in different ways. For example, students may benefit from designing a mentor training session for their organization (or an organization they aspire to work for). This could allow them to apply the material they engage with throughout the course to a real-world setting (virtual or otherwise). Alternatively, students may enjoy meeting the objective by reading a case study that highlights a need for leadership development efforts and suggesting solutions to develop the leadership capacity of employees on their team. This assignment could be enhanced by using one scenario that involves face-to-face teams and another that involves virtual teams. This could create some interesting opportunities for students to compare and contrast efforts that are appropriate in various scenarios.

If the toolbox concept is adopted by the program, faculty will need to discuss this and other options for course assignments in each course offering. New questions will most certainly arise, including: How can/should students collect their ideas – what platform should they use to build their toolboxes? How can we ensure the e-leadership assignments are scalable for application in many industries? Will program faculty be expected to blur the boundaries between teaching and modeling behaviors? How does social media fit in (faculty blogs/accounts, information sharing, personal branding, sharing of original research, etc.)? How can faculty model e-leadership behaviors and stress the importance of e-leadership skills to students while accelerated degrees are shrinking timelines for our programs? Can a leadership educator with no digital footprint teach students about e-leadership, and if so, how? Should students be encouraged to share their toolboxes with one another – and if so, should the toolboxes be presented virtually in a symposium? How can students share this toolbox with their employer, if desired? The body of literature on implementing e-portfolio systems will be an important resource upon implementation.

Graduate programs in the social sciences have long been preparing working adults with the relevant skills to lead virtual teams. Now that employees increasingly find themselves working in virtual spaces, other facets of the study of e-leadership must shift accordingly. As educators, responding to the changing needs of our students is crucial, and in this case, a one-course-at-a-time approach has made the journey toward providing an e-leadership "toolbox" for our students feel like an intentional process that can be replicated across the curriculum.

IMPLICATIONS FOR PRACTICE

While the assignment analyzed for this paper was given in the context of a leadership graduate program, several strategies drawn from the project can be applied to various disciplines, at both the graduate and undergraduate levels. As mentioned in the Literature Review, portfolios are implemented in programs across disciplines with variable levels of success.

Incorporating an e-portfolio system within a program could have positive implications for accreditation and quality enhancement of the degree program(s). Programs pursuing accreditation are often required to assess student learning using both direct and indirect measures. An e-portfolio could serve as a work product that can be scored by an internal or external assessment team. In the example of the e-leadership toolbox, program administrators would also be able to show accreditors how students are applying the information learned in the program to real-world concepts that will help them succeed in the modern workforce.

Establishing a common thread throughout a program could also have positive implications for program marketing. In the instance described in this paper, e-leadership could provide an attractive element for marketing and admissions staff to focus on as they differentiate the program from others offered in the same region and/or discipline. Highlighting timely skills that students will take away from a program that can immediately be applied in a work setting could sway prospective students to view the program as more interesting or practical than a competing option. While this paper focused on the thread of e-leadership to be woven through a Master of Science in Leadership program, the concept is scalable for other disciplines as well. Some potential examples include: weaving a thread of ethical decision-making through a Healthcare Administration program; weaving threads of equity and social justice through a Business Administration program; weaving threads of creativity and innovation through an Engineering program; weaving a thread of professional communication skills through a Teacher Education program. This concept could be scaled and replicated as program needs and local, regional, or national industry needs evolve.

This practice could also have practical implications for student organizations typically sponsored outside of academic departments. The assignment design and e-leadership toolbox concept could potentially be scaled to benefit students in a co-curricular setting. For example, non-credit bearing university-sponsored leadership development programming could implement a version of this assignment in a workshop-style event. Students could feasibly learn about one of the concepts (mentoring, Virtual Personal Board of Directors, or personal branding) in a typical workshop format and then work individually or together in groups to produce an artifact that prompts them to apply the information in a useful way. Some student organizations that maintain even a partial focus on leadership development (student government, social student organizations, leadership societies, sports teams, etc.) could also benefit from these types of exercises.

While formal mentoring partnerships between established and new members in student organizations are likely a long-standing tradition, the other concepts may be novel for these groups. For example, a concerted effort toward educating athletes on personal branding efforts that could work to unify and strengthen their overall team "brand" could prove to be beneficial to multiple stakeholders. The leadership lessons that are ingrained in team sports could be enhanced by a properly scaled exercise in increasing individual leadership capacity through goal-setting and strategic planning efforts designed to support the development and management of individuals' personal brands.

RECOMMENDATIONS

Students were able to meet the learning objectives for this assignment by completing any of the three options presented. Providing choices to students for assignments is often well-received as students tend to enjoy some level of autonomy in their educational experience. Graduate students in particular tend to appreciate assignments that are applicable to their personal careers (Holzweiss et al., 2014; Lee et al., 2015). It is recommended that instructors provide the students with some flexible options that will allow them to meet the objective and create their artifact or "tool" in a way that is meaningful to them.

Initiatives for developing "e-leadership toolbox" items for additional courses are also recommended. Current tentative topics (informed by the e-leadership competencies identified by Van Wart et al., 2019) to be explored in our program include developing and maintaining e-trustworthiness (in the Ethics course), working in virtual teams (in the Small Group Leadership course), communicating online (in the Communication Strategies for Leadership course), and virtual civic engagement (in the Community Leadership course). Programs in other disciplines can emulate this one-course-at-a-time approach by moving through their own assessment or curriculum framework.

LIMITATIONS AND FUTURE DIRECTIONS

This project provides useful reflections and recommendations to assist faculty as they explore options for creative assignments for e-leadership development and/or develop a manageable plan for a new or re-designed portfolio system; however, limitations exist in this example. The sample size for this project was quite small. Smaller class sizes in our elective courses make them ideal for more easily implementing new ideas or strategies. Our total enrollment in the graduate program is typically between 70 and 80, and the researcher recognizes that larger programs would require more resources to implement significant changes.

As always, insights gained beget more questions for future projects. Could this practice be used to inform/develop a new concentration within a program, or perhaps a new micro-credential (such as a graduate certificate or a digital badge)? Could this concept be scaled to serve specific employers or organizations who are shifting to a virtual format for their employees/teams? In this instance, we are exploring the bigger concept of building an "e-leadership toolbox" by starting with the assignment discussed here. Perhaps other programs would identify a different thread that runs across their curriculum and could build a toolbox with a different focus. What value could/would that focus add for students?

Online enrollment for graduate-level social science programs and the number of employees who work from home are both still trending upward. Creating an e-leadership "toolbox" for students to use indefinitely after their program could have benefits for employees and employers for years to come.

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THE EFFECT OF GROUP DIVERSITY ON TEAM AND STUDENT PERFORMANCE

Beverly Mendoza, Stephen F. Austin State University
Rebecca J. Davis, Stephen F. Austin State University

ABSTRACT

Group work and collaborative activities improve social skills, such as communication and leadership, which are sought after in the workplace. Our paper explores the effects of teamwork on student performance in an undergraduate applied statistics course. Particularly, we examine the compositional effects of a group on both team and individual student performance. We find that groups with more females generally perform better, while individual students benefit more from working with a racially-diverse group. In addition, assuming that peer evaluations can accurately measure social skills, we posit that students who are better team players receive higher course grades. Our findings support research on the complementarity between social and cognitive skills where more socially-skilled students benefit more under a collaborative environment.

Keywords: *Team-Based Learning, collaborative learning, diversity, applied business statistics, business statistics, higher education*

INTRODUCTION

Colleges and universities aim to increase the hiring rate of their students upon graduation through various strategies, such as increased academic rigor, career services, alumni networks, local business engagements, etc. While these methods are fruitful, employers are increasingly seeking out job candidates with better social and leadership skills (Borghans et al., 2014; Deming, 2017), as soft skills heavily influence success in the workplace (Heckman and Kautz, 2012). Firms are realizing increased productivity gains from fostering a collaborative work environment (Adhvaryu et al., 2023).

Studies on the readiness of new US workforce entrants show that employers value collaborative and leadership skills over basic knowledge skills (Casner-Lotto and Barrington, 2006; Cimatti 2016; McGunagle and Zizka, 2020), and that recent graduates present a notable lack of soft skills (Hart Research Associates, 2018). Previous research also reports the difficulty employers are facing when seeking college graduates that are proficient in both hard and soft skills (Karimi and Pina, 2021; Cimatti, 2016; Pritchard, 2013; White and Shakibnia, 2019; Hirudayaraj et al., 2021; Green et al., 2023).

To accommodate for the increase in demand for socially-skilled workers, universities actively engage their students through collaborative activities. Research shows that group work improves communication and team work skills for college students (Cho and Kweon, 2017; Elmore et

al., 2014). Further, the increasing complementarity between cognitive and social skills amplifies the positive effects of collaborative work (Weinberger, 2014).

Our paper examines how collaborative work influences student performance at the undergraduate level. Particularly, we study the impact of assigning a semester-long project on student grades. We further analyze the compositional effects of a group on team productivity and individual student performance.

Team-Based Learning (TBL) involves students working collaboratively within a small group, along with peer assessment to promote accountability (Peters et al., 2020; Davis and Mendoza, 2023). TBL has been described as a powerful tool for fostering both engagement and learning (Michaelsen et al., 2014). Many papers have documented the positive influence of TBL on student performance. Haidet et al. (2014) reviewed the educational literature associated with TBL and presented early evidence of positive educational outcomes in terms of knowledge acquisition, participation, engagements, and team performance. Additionally, Cagliesi and Ghanei (2022) find TBL to reduce the academic attainment gap between black, Asian, and minority ethnic (BAME) students and white students, as it enriches student learning experience, making it more enjoyable.

In our paper, we analyze student performance under a TBL framework. We focus on students who took the upper-level applied business statistics course and find small positive effects of collaborative work on their overall course grade. This paper adds to the research that shows the benefit of implementing TBL in math and statistics courses. Peters et al. (2020) found the effects of TBL in a Calculus I course to be generally positive, specifically observing exceptionally high class attendance and higher grades compared to sections that did not foster TBL; while, Campbell and Taylor (2020) observed better student performance among students who took introductory statistics with TBL.

Our paper further extends the literature by examining the effects of group composition and diversity on team and individual student performance. Research shows that diversity is necessary for creating an effective educational environment and enhances educational outcomes (Maruyama et al., 2000). More recent papers find that gender diversity influences team performance. Espey (2018) observes that team success is positively influenced by the percentages of females in the group; while, Hansen et al. (2015) finds that male-dominant groups tend to perform worse in group work.

In our paper, we find that gender diversity only affects team performance, while racial diversity in a group influences individual student performance. Particularly, we observe that having more females in a group has a positive impact on the group's project grade; however, we do not find any evidence of gender diversity in a group affecting individual student success. We also discover that, while racial diversity does not directly impact project grades, it does affect individual students' overall course grade. Specifically, we find that working with more Hispanic students in a group positively affects student course grades, while working with black or African-American students has a weakly negative influence on student grades.

Further, our paper finds that better team players and more socially-skilled students benefit more in a collaborative work environment, that is, assuming that peer evaluations accurately represent teamwork and social skills. Specifically, we find that students with better

peer evaluation scores earn higher overall course grades. This finding provides empirical support for the increasing complementarity between cognitive and social skills (Weinberger, 2014).

Our paper proceeds as follows. The next section details the institutional background surrounding the project and class structure. The succeeding section details the data used, followed by our empirical methodology and results.

BACKGROUND

Applied statistics is an upper-level course that is required of all undergraduate students majoring in the college of business at a regional comprehensive public university. The topics cover data collection, visualization, and analysis through the application of statistical theory such as multiple linear regression models.

Historically, students were only required to complete homework assignments and exams. However, beginning Fall 2021, the course has been administering a semester-long group project, in which students perform data analysis techniques, ranging from data visualization to regression analysis.

The main objective of the project is to promote team-based learning through simulating real-world data analysis by applying statistical theory with Microsoft Excel.[2] Students are tasked with cleaning, organizing, visualizing, and analyzing their dataset. As they complete their tasks, students utilize skills learned from the course, which include but are not limited to the use of Excel pivot tables, charts, formulas, and regression analysis.

Students are allowed to choose their own groups and research project that they were interested in. Each research project includes a research question that is associated with a publicly-available dataset. An example of a research project would be to use a sample from the 2019 American Housing Survey to address the research question: "What determines the market value of a home?" Allowing students to self-select their group and research project increases student engagement and motivation (Crossouard, 2012; Wurdinger et al., 2007). Those who do not select a group by the given deadline are randomly assigned into one. As part of the foundational practices essential for implementing TBL (Michaelsen et al., 2014), students are required to evaluate their group members to promote accountability and responsibility.

The project is completed in two main steps: 1. Data organization and visualization, and 2. Regression analysis. Each step is graded separately to provide detailed feedback throughout the semester and to foster student learning. Although graded separately, the project is still comprehensive in nature as success in Step 2 (regression analysis) can be achieved by having a good understanding of their data from Step 1 (data visualization).

The project grade also includes peer evaluations to emphasize accountability and responsibility. Each group member completes the peer evaluation form, which comprises of rating their peers through a series of evaluation criteria such as "contributed meaningfully to

[2] Most middle-skilled jobs require basic understanding of Microsoft Excel (Formby et al., 2017). For brevity, the paper will refer to Microsoft Excel as Excel.

group discussions," "prepared work in a quality and timely manner," and "did his/her fair share of work that was required." Each criterion is rated using a 10-point scale where 0 implies "strongly disagree" to 10 meaning "strongly agree." The average across the criteria is a group member's evaluation score for their peer. Once submitted, the instructor would determine a student's peer evaluation score by calculating the average evaluation score across his/her group members.

A student's overall project grade is determined by three factors: 1. Project step 1 - data organization and visualization, 2. Project step 2 - regression analysis, and 3. Peer evaluation score. Project step 1 is worth 35% of the project grade, while project step 2 and peer evaluations are weighted 50% and 15%, respectively.

DATA

The dataset primarily consists of student grades collected from electronic gradebooks in each section of the applied statistics course. It contains grades from 1,202 students across 32 sections taught by two instructors, spanning over a five-year period (Fall 2018 - Fall 2022). Table 1 summarizes our data for individual students. Since the group project was introduced in Fall 2021, only 429 students participated in the project, which results in 106 group observations. Table 2 displays the summary statistics for group observations. After receiving IRB exemption, demographic data was provided by the university and matched to the corresponding student through student ID numbers. Once merged, we de-identified the data for analysis.

An average student in our sample is 21 years old with a cumulative GPA of 2.88 and 14.04 attempted credit hours completed at the time of attending the applied statistic course. The average final grade was 78.02, which translates to a letter grade of C. Our sample comprises of 60% males (40% females), 60% whites, 20% Hispanics, and 12% black or African American. The remaining 8% is comprised of Asian, international, and multi-racial students. Race identifications were all self-reported.

The mean score for peer evaluations was 86.85 with a minimum of 0 and maximum of 102. Only 1 student attained a peer evaluation score of over 100 since their group members insisted on a higher than 100 grade due to the student's excellent performance in the group project. To note, there are 159 students who received full marks, or 100, for their peer evaluation. Further, students who did not submit a peer evaluation, regardless of the evaluations their peers submitted, received a score of 0 for peer evaluations.

Table 1
Student Summary Statistics

	Mean	Std. Dev.	Minimum	Maximum	Observations
Final Grade	78.02	15.71	2.33	103	1202
Peer Evaluation Score	86.85	24.87	0	102	429
Semester-Year	5.28	2.40	1.00	9.00	1202
Gender (Female = 1)	0.40	0.49	0.00	1.00	1202
Instructor (Instructor 1 = 1)	0.63	0.48	0.00	1.00	1202
Age	21.34	3.05	18	57	1202
Cumulative GPA	2.88	0.63	0.00	4.00	1202
Attempted Hours	14.04	2.27	3.00	21.00	1202
American Indian or Alaskan Native	0.01	0.08	0.00	1.00	1202
Asian	0.01	0.12	0.00	1.00	1202
Black or African American	0.12	0.33	0.00	1.00	1202
Hispanic	0.20	0.40	0.00	1.00	1202
International	0.02	0.13	0.00	1.00	1202
Two or More	0.04	0.20	0.00	1.00	1202
Unknown or Not Reported	0.00	0.07	0.00	1.00	1202
White	0.60	0.49	0.00	1.00	1202

Focusing on the summary statistics for the 106 groups in our sample, the average project grade was 79.29. We calculated the project grade discounting for the peer evaluation score to examine the effect of group dynamics on project score. Since project step 1 is weighed 35% of a student's overall project grade and project step 2 is worth 50%, we computed the project grade as $projectgrade = projectstep1 * 0.41 + projectstep2 * 0.58$. The average grade for project steps 1 and 2 were 82.80 and 78.18, respectively.

We focus on the following measures to analyze group dynamics: group size, count of female students, races, white students, black students, Hispanic students, Asian students, and international students. An average group is comprised of 4 members with about 2 females and 2 races represented. Groups generally had two to three white students, and one Hispanic student. The average cumulative GPA in a typical group was 2.91.

Since we allow for students to self-select their groups, we account for the number of students with the same major in a group. Considering that students who know each other are likely to be in the same group, we use this measure to control for self-selection. We find that an average group has 2 students who have the same major. There are 17 majors with the majority (93%) coming from the college of business, as expected since the applied statistics course is a required class to graduate. Out of the 17 majors, only 10 were from the college of business.

Table 2
Group Summary Statistics

	Mean	Std. Dev.	Minimum	Maximum	Observations
Project Grade (inc. Step 1 and Step 2 only)	79.29	13.87	28.85	99	106
Project Step 1 Grade	82.80	14.04	0	100	106
Project Step 2 Grade	78.18	17.80	0	100	106
Group Size	4.11	0.92	1	5	106
Count of Female Students	1.65	1.27	0	5	106
Count of Races	2.11	0.73	1	4	106
Count of White Students	2.48	1.30	0	5	106
Count of Black Students	0.48	0.85	0	5	106
Count of Hispanic Students	0.86	0.92	0	4	106
Count of Asian Students	0.07	0.25	0	1	106
Count of International Students	0.05	0.21	0	1	106
Count of Students with Same Major	1.94	0.81	1	4	106
Average Cumulative GPA	2.91	0.35	1.78	3.64	106
Average Attempted Hours	14.18	1.15	9.75	16.5	106
Average Age	21.44	1.74	19.4	30.5	106

When estimating the regression models, we control for the differences in instructor experience, ability, and course management by including a dummy variable equal to one for Instructor 1, and 0 otherwise (for Instructor 2). We also account for the semester and year by including the semester-year variable, which equals one for the first semester (Fall 2018) and increases by one for each succeeding semester. For example, if a student took a course from Spring 2019, the semester-year variable would equal 2. The semester-year variable captures the impact of COVID on teaching modalities, its subsequent effects, and any other variation across time.

EMPIRICAL METHODS & RESULTS

We estimate several linear regression models to examine the impact of group dynamics on the group project grade and individual students' course performance. We implement linear regression analysis because it allows us to measure and quantify the effect of group dynamics on student grades. Specifically, linear regression analysis can measure the strength of the relationship that multiple variables have with a given dependent variable. Regression analysis accounts for the differences in student background, instructors, and other variable components that could influence student grades which yields accurate measurements. In measuring group dynamics, we mainly focus on gender and racial diversity.

Impact of Group Dynamics on Project Grade

The impact of group dynamics on the project grade was examined through estimating the following regression model.

$$\text{Project Grade}_j = \alpha + \beta\,(\text{Group Dynamics Measure})_j + C_j + \varepsilon_j \quad (1)$$

Equation 1 evaluates how group *j*'s project grade was influenced by its group dynamics. The coefficient of interest, β, estimates the impact of group dynamics on project grade. We consider several measures for estimating group dynamics, which includes the count of female, white, black or African American, Hispanic, Asian, and international students, and the number of different races in a group. C_i reflects the controls added to the regression including group size, count of students with the same major, instructor, semester-year, group average age, average cumulative GPA, and group average attempted hours. Table 3 show the results from estimating Equation 1.

We find that gender diversity impacts project grades. Specifically, we found that having one more female in the group increases the project grade by 2.07 points, on average, as seen in Column I of Table 3. Our finding is consistent when accounting for racial diversity.

Based on our estimations, we observe that racial diversity does not affect a group's project grade. Even accounting for multiple races in a group does not impact project grades. However, we found that having an international student in the group significantly increases the project grade by 11.35 points.

Unsurprisingly, we note that groups with higher average cumulative GPAs tend to earn higher project grades by 10.72 points. Since cumulative GPAs can reflect student achievement, higher cumulative GPAs could indicate a student's academic achievement, including their commitment and dedication to learning.

Table 3
Project Grade Regressions

	I	II	III	IV	V	VI	VII
Count of Females	2.0700* (1.10)	2.0655* (1.10)	2.0605* (1.11)	2.1142* (1.10)	1.9900* (1.10)	2.0631* (1.10)	1.7215 (1.10)
Count of Races		-0.3278 (1.80)					
Count of White			-0.1061 (1.11)				
Count of Black				-1.2444 (1.48)			
Count of Hispanic					1.5136 (1.43)		
Count of Asian						0.8179 (5.11)	
Count of Int'l students							11.4792* (6.13)
Count of Same Major	-0.2303 (1.79)	-0.2876 (1.82)	-0.2205 (1.80)	-0.2509 (1.79)	-0.3358 (1.79)	-0.2441 (1.80)	0.2540 (1.78)
Group Size	2.4795 (1.69)	2.5623 (1.76)	2.5484 (1.85)	2.5664 (1.70)	2.1868 (1.71)	2.4615 (1.70)	2.4379 (1.67)
Instructor (Instructor 1=1)	-3.8765 (2.58)	-3.8719 (2.59)	-3.8871 (2.59)	-4.0146 (2.58)	-4.2033 (2.59)	-3.9109 (2.60)	-4.0739 (2.55)
Semester-Year	2.1354 (1.56)	2.1411 (1.57)	2.1352 (1.57)	1.9815 (1.57)	2.2080 (1.56)	2.1159 (1.57)	1.4443 (1.58)
Avg. Cum. GPA	10.7940*** (3.95)	10.7679*** (3.97)	10.8210*** (3.98)	10.7303*** (3.96)	11.3929*** (3.99)	10.7823*** (3.97)	11.4266*** (3.92)
Avg. Attempted Hours	1.4463 (1.21)	1.4737 (1.22)	1.4358 (1.22)	1.5179 (1.21)	1.4898 (1.21)	1.4273 (1.22)	1.3783 (1.19)
Avg. Age	0.4390 (0.82)	0.4222 (0.83)	0.4499 (0.83)	0.4185 (0.82)	0.5596 (0.83)	0.4346 (0.82)	0.5722 (0.81)
R^2	0.224	0.225	0.224	0.230	0.233	0.224	0.252
Observations	106	106	106	106	106	106	106

Note: The dependent variable across all specifications is the group project grade, which includes both Step 1 and Step 2 grades. Standard errors are reported in parentheses below the coefficients. * p<.10, ** p<.05, *** p<.01.

To further examine the impact of group dynamics, we analyze their effects on the grades from project steps 1 and 2, separately. Table 4 shows the regression results from using project step 1 grade instead of the total project grade as the dependent variable. We find that having more females in the group increases the grade for the first part of the project. Particularly, having one more female student increases the step 1 grade by 1.9 points. Analyzing the impact of racial diversity, we do not find any evidence of impacting grades at the first stage of the project.

We also observe that group size has a strong positive effect on project step 1 grades. We find that having one more student in the group increases the grade by 4.7 points, on average. We

surmise that our positive results reflect that our groups are restricted to five students, implying economies of scale. However, as theory suggests, having enormous groups of people should result in a decreasing trend in grades.

Table 4
Project Step 1 Grade Regressions

	I	II	III	IV	V	VI	VII
Count of Females	1.9048* (1.13)	1.9043* (1.13)	1.8668 (1.14)	1.9302* (1.13)	1.8373 (1.13)	1.9001* (1.13)	1.6242 (1.14)
Count of Races		-0.0379 (1.85)					
Count of White			-0.4250 (1.13)				
Count of Black				-0.7148 (1.53)			
Count of Hispanic					1.2763 (1.47)		
Count of Asian						0.5512 (5.24)	
Count of Int'l students							9.2418 (6.33)
Count of Same Major	-1.2039 (1.83)	-1.2105 (1.87)	-1.1644 (1.84)	-1.2157 (1.84)	-1.2928 (1.84)	-1.2132 (1.84)	-0.8140 (1.84)
Group Size	4.7231*** (1.73)	4.7326** (1.80)	4.9990*** (1.89)	4.7730*** (1.74)	4.4763** (1.76)	4.7109*** (1.75)	4.6895*** (1.72)
Instructor (Instructor 1 = 1)	-4.4835* (2.64)	-4.4830* (2.66)	-4.5259* (2.66)	-4.5629* (2.66)	-4.7590* (2.66)	-4.5067* (2.66)	-4.6425* (2.63)
Semester-Year	2.6556 (1.60)	2.6563 (1.61)	2.6550 (1.61)	2.5672 (1.62)	2.7169* (1.60)	2.6425 (1.61)	2.0992 (1.64)
Avg. Cum. GPA	5.6718 (4.05)	5.6688 (4.08)	5.7798 (4.08)	5.6352 (4.07)	6.1768 (4.10)	5.6639 (4.07)	6.1811 (4.04)
Avg. Attempted Hours	0.7011 (1.24)	0.7043 (1.25)	0.6589 (1.25)	0.7422 (1.25)	0.7378 (1.24)	0.6883 (1.25)	0.6463 (1.23)
R^2	0.204	0.204	0.205	0.206	0.210	0.204	0.221
Observations	106	106	106	106	106	106	106
Note: The dependent variable across all specifications is a group's grade on Step 1 of the project. Standard errors are reported in parentheses below the coefficients. * p<.10, ** p<.05, *** p<.01.							

Similarly, we estimate Equation 1 with project step 2 grades as the dependent variable. Table 5 displays our regression estimates. Surprisingly, we find no evidence of group dynamics influencing grades for the second stage of the project. However, we do observe that having a higher average cumulative GPA within the group, meaning that students with good past academic performance, tends to receive higher step 2 grades; while, the cumulative GPA had no influence when analyzing its impact on step 1 grades.

We deduce that group dynamics play an important role in the earlier stages of the project, while student achievement is more significant in the second stage of the project. We interpret that step 2 of the project tasks students to perform regression analysis, a more statistically-advanced technique to data visualization methods used in project step 1, implying that academic achievement can determine grades when using more advanced concepts over group dynamics.

Table 5
Project Step 2 Grades Regressions

	I	II	III	IV	V	VI	VII
Count of Females	2.2225 (1.46)	2.2152 (1.46)	2.2330 (1.47)	2.2808 (1.46)	2.1322 (1.46)	2.2139 (1.46)	1.8199 (1.46)
Count of Races		-0.5384 (2.39)					
Count of White			0.1176 (1.47)				
Count of Black				-1.6401 (1.97)			
Count of Hispanic					1.7074 (1.91)		
Count of Asian						1.0206 (6.77)	
Count of Int'l students							13.2588 (8.16)
Count of Same Major	0.4539 (2.37)	0.3599 (2.42)	0.4430 (2.39)	0.4269 (2.37)	0.3350 (2.38)	0.4367 (2.38)	1.0133 (2.38)
Group Size	0.9363 (2.24)	1.0724 (2.33)	0.8600 (2.45)	1.0508 (2.25)	0.6061 (2.27)	0.9138 (2.26)	0.8882 (2.22)
Instructor (Instructor 1=1)	-3.5143 (3.42)	-3.5066 (3.43)	-3.5025 (3.44)	-3.6963 (3.43)	-3.8828 (3.44)	-3.5571 (3.44)	-3.7423 (3.39)
Semester-Year	1.8045 (2.07)	1.8138 (2.08)	1.8046 (2.08)	1.6016 (2.09)	1.8864 (2.07)	1.7801 (2.09)	1.0062 (2.11)
Avg. Cum. GPA	14.6010*** (5.24)	14.5581*** (5.27)	14.5711*** (5.28)	14.5170*** (5.25)	15.2766*** (5.30)	14.5864*** (5.27)	15.3317*** (5.22)
Avg. Attempted Hours	1.9980 (1.60)	2.0431 (1.62)	2.0097 (1.62)	2.0924 (1.61)	2.0471 (1.60)	1.9743 (1.62)	1.9195 (1.59)
R^2	0.172	0.172	0.172	0.178	0.179	0.172	0.194
Observations	106	106	106	106	106	106	106
Note: The dependent variable across all specifications is a group's grade on Step 2 of the project. Standard errors are reported in parentheses below the coefficients. * p<.10, ** p<.05, *** p<.01.							

Impact of Group Dynamics on a Student's Overall Course Grade

We further examine the impact of group dynamics on individual student performance by estimating the following regression model.

$$\text{Course Grade}_i = \alpha + \beta_1 \text{Project}i + \beta_2 (\text{Group Dynamics Measure}i) + C_i + \varepsilon_i \quad (2)$$

Equation 2 estimates the effect of a group project and its dynamics on a student's overall course grade. Our main coefficient of interest is β_2 which measures the impact of group dynamics on student grades. Similar to our previous model, our group dynamics measures focus on gender and racial diversity.

Our model includes a dummy variable to indicate whether the student participated in the project (Project = 1), or not (Project = 0) since our sample includes semesters where the project was not assigned. Ci contains controls for race, gender, instructor, semester-year, age, cumulative GPA, and attempted hours. Table 6 displays the regression estimates for Equation 2.

We find that overall course grades are not strongly influenced by the project. However, we observe that having an international student in the group has a strong positive effect on student grades with 99% significance. Particularly, one more international student increases a student's course grade by 9.59 points, which is almost a letter grade.

We also find evidence that racial diversity in a group project influences a student's overall course grade. Specifically, we observe that including an additional Hispanic student in the group increases a student's grade by 1.86 points. While, having one more black or African-American student has a weakly negative impact on a student's grade, decreasing it by 1.49 points, on average.

We further note that students who self-report at American Indian or Alaskan native or Asian generally outperform other students by 10.03 points and 9.05 points, respectively. International students also receive higher grades, on average, by 5.16 points.

Our results do not indicate that gender diversity in a group project influences individual student grades. We also do not find evidence of grade disparity between female and male students.

Table 6
Course Grade Regressions

	I	II	III	IV	V	VI	VII	VIII
Project	1.0465 (3.99)	0.2583 (4.21)	1.0267 (4.00)	1.3969 (3.99)	1.8558 (4.00)	0.8535 (4.00)	0.4558 (3.99)	0.9465 (3.99)
Count of Females	0.5658 (0.55)	0.5690 (0.55)	0.5348 (0.55)	0.6181 (0.55)	0.5155 (0.55)	0.5882 (0.55)	0.3113 (0.55)	
Count of Races		0.5520 (0.93)						
Count of White			-0.3524 (0.58)					
Count of Black				-1.4869* (0.78)				
Count of Hispanic					1.8554** (0.74)			
Count of Asian						-2.1874 (2.59)		

Count of Int'l students							9.5907*** (3.26)	
Count of Same Major	0.8509 (0.87)	0.9455 (0.89)	0.8844 (0.88)	0.8353 (0.87)	0.7956 (0.87)	0.9011 (0.88)	1.2742 (0.88)	0.8032 (0.87)
Group Size	-0.1875 (0.98)	-0.3284 (1.01)	0.0221 (1.04)	-0.0846 (0.99)	-0.7391 (1.01)	-0.1474 (0.99)	-0.1966 (0.98)	0.0758 (0.95)
Instructor (Instructor 1=1)	3.9254*** (0.85)	3.9284*** (0.85)	3.9240*** (0.85)	3.8836*** (0.85)	3.8852*** (0.85)	3.9712*** (0.85)	3.8753*** (0.85)	3.9117*** (0.85)
Semester-Year	-0.5979** (0.29)	-0.5949** (0.29)	-0.5935** (0.29)	-0.6252** (0.29)	-0.5783** (0.29)	-0.5864** (0.29)	-0.6612** (0.29)	-0.5874** (0.29)
Cum. GPA	12.4291*** (0.63)	12.4225*** (0.63)	12.4216*** (0.63)	12.4796*** (0.63)	12.4794*** (0.63)	12.4334*** (0.63)	12.4951*** (0.63)	12.4585*** (0.63)
Attempted Hours	0.0155 (0.17)	0.0126 (0.17)	0.0136 (0.17)	0.0167 (0.17)	0.0127 (0.17)	0.0194 (0.17)	0.0160 (0.17)	0.0165 (0.17)
Female Student = 1	0.1288 (0.84)	0.1428 (0.84)	0.1131 (0.84)	0.1648 (0.84)	0.1278 (0.84)	0.1478 (0.84)	-0.1140 (0.84)	-0.1472 (0.80)
American Indian or Alaskan Native	10.0345** (5.04)	9.8419* (5.05)	10.2027** (5.05)	10.0322** (5.04)	9.8247* (5.03)	10.3432** (5.06)	8.6884* (5.05)	10.1062** (5.04)
Asian	9.0507*** (3.26)	8.8739*** (3.27)	9.3067*** (3.28)	8.8584*** (3.26)	9.2324*** (3.25)	7.6884** (3.64)	8.0218** (3.27)	9.1296*** (3.26)
Black or African American	-1.4928 (1.22)	-1.6291 (1.24)	-1.3462 (1.24)	-2.0860* (1.25)	-1.4908 (1.21)	-1.5402 (1.22)	-1.4106 (1.21)	-1.4681 (1.22)
Hispanic	1.2894 (1.00)	1.1890 (1.01)	1.4770 (1.05)	1.3367 (1.00)	2.3412** (1.08)	1.2619 (1.00)	1.0817 (1.00)	1.2860 (1.00)
International	5.1569* (3.02)	4.9647 (3.04)	5.3082* (3.03)	5.0919* (3.02)	4.6994 (3.02)	5.3331* (3.03)	12.5022*** (3.91)	5.2230* (3.02)
Two or More	-0.5258 (1.98)	-0.6725 (1.99)	-0.2969 (2.01)	-0.3707 (1.98)	-0.4884 (1.97)	-0.5713 (1.98)	-0.6357 (1.97)	-0.5507 (1.98)
Unknown or Not Reported	-0.7283 (5.47)	-0.8809 (5.48)	-0.4821 (5.49)	-0.8061 (5.47)	-0.8872 (5.46)	-0.7592 (5.47)	-0.7519 (5.46)	-0.8277 (5.47)
R^2	0.300	0.300	0.300	0.302	0.304	0.301	0.305	0.300
Observations	1202	1202	1202	1202	1202	1202	1202	1202

Note: The dependent variable across all specifications is the overall course grade of a student. Estimates are conditional on the student being subject to the project. Standard errors are reported in parentheses below the coefficients. * p<.10, ** p<.05, *** p<.01.

To account for student performance within the group, we consider their peer evaluation scores as research shows that peer assessments are valid and reliable tools in measuring student contribution (Yoon et al. 2018; Wahawisan et al. 2016). We estimate the following regression.

$$\text{Course Grade}_i = \alpha + \beta_1 \text{Peer Evaluation Score}_i + \beta_2 (\text{Group Dynamics Measure}i) + C_i + \varepsilon_i \quad (3)$$

We limit our sample to only contain those who participated in the project, and we use the same measures for Group Dynamics and controls as in Equation 2. Table 7 shows the regression estimates of Equation 3.

Accounting for the peer evaluation score and focusing only on those who participated on the project, our findings remain generally consistent. Particularly, we find that having an additional Hispanic student in the group raises a student's grade by 1.45 points, on average. Having one more international student in the group significantly increases a student's grade by 6.08 points. We find that once we consider peer evaluation scores, we do not find evidence of the negative impact of having black or African-American students in the group. We also still find no evidence of gender diversity influencing a student's overall grade.

We further find that students with better peer evaluation scores earn higher overall course grades. Specifically, a one-point increase in a student's peer evaluation score increases their overall course grade by 0.26 points. This finding coincides with previous research. In their meta-analysis, Li et al. (2019) synthesized results from 58 studies and found that students participating in peer assessments show increased performance. Other studies also conclude that peer evaluations promote engagement and participation (Alt and Raichel, 2020; Zhang, 2012).

Alt and Raichel (2020) imply that social interactions and peer assessments are positively correlated as it demonstrates the collaboration among students. Therefore, considering that peer evaluations can accurately represent student social and teamwork skills, we surmise from our findings that students who are better team players benefit more in a collaborative environment.

We also observe that Asian and international students generally outperform other students, on average, by 9.45 and 12.57 points, respectively. This is consistent when considering all students (those who have and have not participated in the project). When only focusing on the students who completed the project, we find that Hispanic students also earn a higher grade relative to an average white student by 2.27 points.

Table 7
Peer Evaluation Effect on Overall Grade

	I	II	III	IV	V	VI	VII	VIII
Peer Evaluation	0.2630*** (0.02)	0.2629*** (0.02)	0.2634*** (0.02)	0.2623*** (0.02)	0.2608*** (0.02)	0.2613*** (0.02)	0.2616*** (0.02)	0.2630*** (0.02)
Count of Females	0.0138 (0.48)	0.0202 (0.48)	-0.0274 (0.48)	0.0363 (0.48)	-0.0342 (0.48)	0.0272 (0.48)	-0.1096 (0.48)	
Count of Races		0.3844 (0.76)						
Count of White			-0.5476 (0.50)					
Count of Black				-0.5840 (0.71)				
Count of Hispanic					1.4469** (0.63)			
Count of Asian						-2.2113 (2.20)		

Count of Int'l students							6.0826** (2.90)	
Count of Same-Major	-0.0112 (0.67)	0.0482 (0.68)	0.0261 (0.67)	-0.0127 (0.67)	-0.0486 (0.67)	0.0449 (0.67)	0.2141 (0.68)	-0.0121 (0.67)
Group Size	0.7707 (0.78)	0.6727 (0.80)	1.1017 (0.84)	0.8185 (0.78)	0.4080 (0.79)	0.7996 (0.78)	0.7110 (0.77)	0.7767 (0.75)
Instructor (Instructor 1=1)	2.7506*** (1.03)	2.7456*** (1.03)	2.7175*** (1.03)	2.7192*** (1.03)	2.5830** (1.02)	2.8431*** (1.03)	2.7796*** (1.02)	2.7508*** (1.03)
Semester-Year	0.8181 (0.61)	0.8313 (0.61)	0.8520 (0.61)	0.7844 (0.61)	0.9584 (0.61)	0.8407 (0.61)	0.5950 (0.62)	0.8191 (0.61)
Cum. GPA	8.0199*** (0.77)	8.0067*** (0.77)	7.9943*** (0.77)	8.0494*** (0.77)	8.1438*** (0.77)	8.0987*** (0.77)	8.0403*** (0.77)	8.0222*** (0.77)
Attempted Hours	0.1312 (0.22)	0.1284 (0.22)	0.1299 (0.22)	0.1258 (0.22)	0.1299 (0.22)	0.1465 (0.22)	0.1332 (0.22)	0.1312 (0.22)
Female Student = 1	0.9703 (1.04)	0.9940 (1.04)	0.9857 (1.04)	0.9734 (1.04)	1.0240 (1.03)	0.9516 (1.04)	0.9418 (1.03)	0.9761 (1.02)
American Indian or Alaskan Native	4.1940 (10.14)	3.3929 (10.27)	3.1296 (10.19)	4.0838 (10.14)	3.4092 (10.09)	6.3393 (10.36)	-1.1972 (10.42)	4.2002 (10.13)
Asian	9.4454** (3.89)	9.1247** (3.94)	9.5736** (3.89)	9.2939** (3.89)	9.7675** (3.87)	9.3091** (3.89)	7.8568** (3.94)	9.4477** (3.88)
Black or African American	-2.0587 (1.56)	-2.3270 (1.65)	-2.4132 (1.60)	-1.6505 (1.64)	-2.0391 (1.55)	-2.2038 (1.57)	-1.9879 (1.56)	-2.0579 (1.56)
Hispanic	2.2680* (1.24)	2.0813 (1.29)	2.1286* (1.24)	2.3177* (1.24)	2.0478* (1.23)	2.2088* (1.24)	1.8778 (1.25)	2.2679* (1.24)
International	12.5706*** (4.59)	12.0564** (4.71)	11.9539** (4.63)	12.4463*** (4.60)	11.2811** (4.60)	13.3173*** (4.65)	13.0572*** (4.58)	12.5752*** (4.58)
Two or More	-2.1816 (2.60)	-2.4815 (2.67)	-2.1894 (2.60)	-2.0074 (2.61)	-2.0743 (2.59)	-2.3192 (2.60)	-2.3527 (2.59)	-2.1797 (2.59)
Unknown or Not Reported	4.5019 (7.18)	4.2342 (7.21)	4.6587 (7.18)	4.4323 (7.19)	4.2284 (7.15)	4.3498 (7.18)	4.8028 (7.15)	4.4951 (7.17)
R^2	0.522	0.522	0.524	0.523	0.528	0.523	0.527	0.522
Observations	429	429	429	429	429	429	429	429

Note: The dependent variable across all specifications is the overall course grade of a student. Sample only focuses on students who participated in the project. Standard errors are reported in parentheses below the coefficients. * p<.10, ** p<.05, *** p<.01.

CONCLUSION

This paper has shown the effects of gender and racial diversity on team performance and individual student course grades in an undergraduate applied statistics course. Groups that have more females generally perform better, while individual students benefit more from working with a racially-diverse group.

Considering that peer evaluations accurately measure social skills, we posit that students who are better team players receive higher course grades. This observation supports research on

the complementarity between social and cognitive skills, where more socially-skilled students learn more under a collaborative work environment.

Our findings suggest that instructors should consider the benefits of implementing a Team-Based Learning framework into their classes as it positively influences both team and student performance. However, when doing so, instructors should be mindful of the potential group dynamics. Specifically, our observations imply that encouraging group diversity fosters student learning, therefore, instructors could improve collaborative learning by being mindful of student group compositions. We also believe that providing students with opportunities to develop their social skills could enhance learning due to the complementarity between social and cognitive skills.

Overall, our paper contributes to the literature by examining the effects of Team-Based Learning in an applied business statistics course. Our findings provide further support for its effectiveness, extending the literature on how group composition can affect both team and student performance.

We acknowledge that our findings are limited to the data gathered from a single regional public university. Research using a broader set of data collected from multiple universities could yield more accurate student representation and results. We also encourage future research to include a survey of students to further elaborate on group dynamics, such as the implications of varying socio-economic background on teamwork.

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A COLLABORATIVE FACULTY-DRIVEN APPROACH FOR BUSINESS SKILL DEVELOPMENT IN EXECUTIVE MBA PROGRAMS

Alison M. Keefe, Kennesaw State University
Thomas Devaney, Kennesaw State University
Marko R. Jocic, Kennesaw State University

ABSTRACT

30 years ago, Kennesaw State University's College of Business experienced an increased demand from working adults who did not necessarily have a business education background but desired to obtain their MBA. With this limitation in mind, it developed an Executive MBA (EMBA) where today roughly 50% of its students lack a business undergraduate degree upon entering the program. As such, the program is challenged with developing a foundational curriculum to overcome business acumen skill deficits while also providing a non-traditional adult business student with pedagogy and tools that enable them to absorb and integrate the material quickly and across functional areas. The Income/Outcome® game-based simulation helps in accomplishing this by immersing learners in an all-encompassing business acumen teaming exercise that demonstrates the outcomes of decision-making on functional areas of business via nontraditional classroom pedagogy while incorporating a collaborative faculty teaching model to enhance the learning exercise. Building upon the Constructivism Learning Theory framework, we present a fifteen-year study of the Income/Outcome® simulation employed in our Executive MBA Program. Using a pre- and post-survey, we examine perceived foundational business acumen knowledge and skill attainment across multiple functional areas of business. With a significant difference in skill perceptions between the two surveys for most functional areas, the results indicate that this simulation has had a causal improvement on skill development of approximately 18% and thus a broader more effective learning experience for EMBA students.

Keywords: *game-based learning, Constructivism Learning theory, action learning, collaborative teaching, Income/Outcome® Simulation, student perceptions.*

INTRODUCTION

THE EXECUTIVE MBA (EMBA) STUDENT LEARNING APPROACH

Higher-ed business schools traditionally organize their courses around functional areas. This traditional approach no doubt provides students with in-depth knowledge of specific business concepts, however, it can lead to a siloed understanding of how the functional areas

interact and impact one another. This approach is less effective for EMBA students (adult learners with an average age of 38, 16 years of work experience, 8 years of management experience, and 6 or more years since their undergraduate degree completion) who choose an Executive MBA program format for relevancy, applicability, and speed of degree. At Kennesaw State University's Coles College of Business, our innovative pedagogical approach delivers on this demand by providing our students an integrative business action learning experience using a collaborative faculty model where all faculty team teach to enhance that integration. An established body of literature emphasizes an integrated curriculum to meet the demands of corporations and learning attributes of EMBA students (Jhan et al. 2023; Laessig & Myers 2010; Smith & Fletcher 2004; Conger & Xin 2000; Moodie & Roebuck 2002; Stumpf & Tymon 2002; Crotty & Soule 1997; Verlander 1989). Updated studies in the literature have been difficult to find with the exception of Jhan et. al 2023. However, the dated studies are still used today as models in EMBA curriculum development and continue to exemplify the foundation that EMBA Programs need to deliver an integrative, cross-functional curriculum specific to the learning attributes of the EMBA student.

Since the 90s, the Kennesaw State University College of Business's Executive MBA Program has observed the value of an integrated curriculum faculty team-teaching design. This 19-month lock-step cohort-based program is designed to address the knowledge gap between business acumen and people skills using a program long teaming format. The 5-semester format allows adult students to complete courses using a multi-functional integrated unit-based framework (instead of a traditional one subject course) with a variety of activities that focus on teaching EMBA students how to deal with work-related issues. The Program involves a team-based approach for students and as such, faculty are asked to incorporate a team-teaching approach to model the integrative process. The main functional business areas are team-taught to show the impact on organizational decision-making and only those faculty who are willing to collaborate and team-teach participate in the Program.

According to Stumpf and Tymon (2002), programs that "emphasize practical "hands-on" action learning" will create an environment that allows greater student engagement and high self-reported levels of learning. More recent studies confirm the achievement of learning outcomes such as skill development through high rates of student engagement (Huang et al. 2022; Rogmans & Abaza 2019; and Buil et al. 2019); and overall, EMBA students learn better when there are high levels of experiential engagement. These characteristics make the EMBA student well-suited to operate in an action learning environment. Conger and Xin (2000), Kamath et al. (2008), and Perusso et al. (2021) have argued for a greater use of action based or experiential learning experiences for students in business education. However, studies outlining the learning challenges of Executive MBA (EMBA) programs along with curriculum innovations that accommodate the learning differences are limited (Jhan et al. 2023; Han & Liang 2015; and Laessig & Myers 2010). Only about 50% of incoming Coles College of Business EMBA students have an undergraduate business degree thus, it is imperative that the Program provides a solid foundation to help students understand how the functional areas are integrated in an organizational environment. Since the studies above also show that EMBA students demonstrate a greater ability to learn through action learning, lecture time is limited and the concept of

"learning by doing" is a pervasive theme throughout the 19-months. A need for an experiential learning atmosphere is imperative for the development and success of the EMBA student.

SIMULATIONS AS GAMED-BASED ACTION LEARNING TOOLS

Business education has been trending toward greater learner-centered environments, especially through action type learning projects since the mid-90s (Conger & Xin 2000; Stopper 1998). This trend involves team-based experiential exercises in which the aim is to solve workplace relevant type issues. The value in this type of learning format or pedagogy is that individuals are more motivated to learn because of their active involvement in the learning process and when they can understand the importance or relevance of the problem to their own lives and careers. The pervasive theme throughout the business simulation literature is that there is continued and growing evidence of the effectiveness of action learning through game-based simulations as a means for students to learn and obtain skills. (Huang et al. 2022; Beranic and Hericko 2022; Hallinger & Wang 2020; Buil et al. 2019; Bell & Loon 2015; Blackford & Shi 2015; Lean et al. 2015, Loon et al. 2015; Khan & Pearce 2015; Tiwari, Nafees, & Krishnan 2014; Lu, Hallinger, & Showanasai 2014; Anderson & Lawton 2009; Gabrielsson, Tell, & Politis 2010; Adobor & Daneshfar 2006). This very extensive body of literature shows that there is well-documented validation that the use of business simulations is an effective learning tool, and that action learning is a proven means of delivering relevant and applicable material to students. The process of integrating action learning into the classroom allows students to make decisions and experience how the concepts and knowledge provided in a traditional lecture can be used in applicable situations (Fox et al., 2018; Matute & Melero, 2016; Piercy & Caldwell 2011; Pasin & Giroux 2011; Gredler 2004; Larreche 1987).

Furthermore, business simulations can provide decision-making capabilities and cross-functional connections because during the simulation, complex problems are presented that require immediate applicability of learned concepts. Capelo and Silva (2020), Goi (2019), and Pasin and Giroux (2011) all supply evidence that simulations are a more effective way for students "to develop decision-making abilities for managing complex and dynamic situations" versus the traditional lecture. Buil et al. (2019), and Borrajo et al. (2010) have both demonstrated that business simulations can increase a student's learning and skills across functional business areas and Gabrielsson, Tell, and Politis (2010) fully outline the initiative of using business simulations as a means of supporting experiential learning in business schools. Both Capelo and Silva (2020) and Hall and Ko (2006) provide evidence that "students engaged in simulations retain about 75% of the instructional content compared to 5% for lectures and 20% for audio-visual presentations." Critics of business simulations state that they are an "inefficient pedagogy for teaching terminology, factual knowledge, basic concepts, or principles" and that basics can be covered more quickly with a lecture (Anderson & Lawton 2009). However, the research overwhelming supports action learning and the use of simulations in the achievement of retained learning thus, these studies prove the effectiveness of business simulations.

We investigate whether an experiential game-based simulation such as Income/Outcome® using a collaborative faculty teaching model can be more effective for

development of foundational business knowledge and skills across all functional areas in an Executive MBA (EMBA) Program. Whereas previous studies have detailed the advantages of using simulations for student engagement, motivation, knowledge, and skill development (Buil et al. 2019; Wei et al. 2022; Huang et al. 2023), not many use two instruments (pre- and post-surveys) for measurement, none used a collaborative faculty teaching model, none were focused on adult learners who have been in the workforce for over a decade, none have been long-term over many groups of students, and none were focused on specific skill attainment across all functional areas of business. Kiss and Schmuck (2021) outline that long-term research into skill attainment using business simulations are not common and many use one survey instrument versus pre- and post-surveys. Based on prior research that knowledge and skill development can be attained by means of simulations, this paper engages the Constructivism Learning theory to measure development of cross-functional foundational business acumen knowledge and skills, using a pre- and post- perception skill survey, by employing a game-based experiential learning simulation involving faculty who team-teach throughout the simulation. Thus, this paper advances the established business pedagogy research by intentionally targeting specific foundational business knowledge and skills that Coles College EMBA students need to acquire quickly given the deficiency of business acumen upon entering the program and provides evidence over a long span of time of the benefits of a collaborative faculty team-taught game-based experiential learning on EMBA students.

THEORECTICAL FRAMEWORK AND RESEARCH HYPOTHESIS

Constructivism Learning theory follows the teachings of Dewey and has created an underlying framework and teaching methodology for this project. According to Chuang (2021), "The effectiveness of adult education and training may be influenced by how well instructors understand and apply fundamental learning theories and principles into practice. Adult learning theories explain phenomena of how adults learn and offer essential knowledge and insights in respect to adult learners' development." As this research is centered around working adult education in an EMBA program, this learning theory became prevalent in our approach to conducting the simulation and the overall instruction in the program. In and of its core, Constructivism Learning theory is a student's ability to construct their own knowledge and skills from the experiences they have. They are active participants in their own learning through action learning type of activities such as simulations. Bada and Olusegun (2015) explain the theory as "Constructivism is an approach to teaching and learning where students learn by fitting new information together with what they already know" and by constructing knowledge and skills through action rather than passive activities. "Natural cumulative learning occurs by creating personal meaning through experiential learning which focuses on hands-on and active learning events to enhance learners' engagement and learning retention" (Chuang 2021). The Income/Outcome® simulation does have team-taught foundational business lectures associated within it. However, in this case and in a Constructivism Learning environment, the EMBA students maintain most of the control over running the simulation and the team-teaching faculty

members who serve as instructors are primarily there to facilitate and assist in the development of understanding as well as knowledge and skills.

This study occurred over a 15-year period and utilizes pre- and post-survey perception data of the Income/Outcome® simulation to determine its effects on Kennesaw State University College of Business EMBA student knowledge and skill development. The study involved 876 participants (22 cohorts of EMBA students over 15 years). Appendix A provides the survey instrument foundational knowledge and skill perception questions used in both surveys. Knowledge and skills are differentiated in this study as knowledge being the information obtained in the lectures and books and skills referring to the application of knowledge in practice. The pre- and post-simulation surveys were constructed of 16 closed questions using a 5-point symmetrical Likert-survey instrument. The survey answers ranged from mostly unconfident (1) for the knowledge or skill to mostly confident (5). During the lectures embedded in the simulation, all foundational functional area skills were covered, however, marketing and operations lectures were limited as much of that material is presented in the next semester. Thus, marketing and operations knowledge was not tested. Management knowledge was tested as students enter the program with 8 years of management experience so that knowledge base should be present. The survey does list all foundational skills as those are present in the simulation itself but there was more focus on finance and accounting knowledge since that is the weakest area for most incoming students therefore, those areas were tested.

As stated, an average of 50% of Coles College EMBA students don't have an undergraduate business degree or had completed their undergraduate degree over 6 years prior so we expect their foundational business knowledge and skill abilities to be limited and we also expect that pre-survey indicators will average in the unconfident range. The collected data was measured to indicate whether foundational knowledge and skills have been perceived to be attained or increased over the length of the simulation to provide a clearer picture of student learning using the simulation. A data analysis was run on the indicators from the surveys. We propose that once students have completed the simulation, they will be able to realize the importance of an integrated business curriculum because their perceptions of their business knowledge and skill development will increase. We also propose that experiential learning provides a faster way to develop cross-functional foundational business acumen for EMBA students. Since the prior research presented shows support for the effectiveness of business simulations in knowledge and skill attainment, we combine knowledge and skills in our initial hypothesis that EMBA students' perceptions of their foundational business knowledge and skill development will increase as a direct result of participating in the simulation.

H1: The Income/Outcome® simulation will positively influence perceived business knowledge and skills development.

We then separate the different functional areas of business based on the survey questions and hypothesize whether the simulation develops specific business area knowledge and skills.

H2: The Income/Outcome® simulation will positively influence perceived finance knowledge development.

H3: The Income/Outcome® simulation will positively influence perceived accounting knowledge development.
H4: The Income/Outcome® simulation will positively influence perceived marketing skills development.
H5: The Income/Outcome® simulation will positively influence perceived sales skills development.
H6: The Income/Outcome® simulation will positively influence perceived management knowledge development.
H7: The Income/Outcome® simulation will positively influence perceived operations skills development.
H8: The Income/Outcome® simulation will positively influence perceived negotiation skills development.
H9: The Income/Outcome® simulation will positively influence perceived strategic-thinking skills development.
H10: The Income/Outcome® simulation will positively influence perceived strategic decision-making skills development.
H11: The Income/Outcome® simulation will positively influence perceived income statement generation skills development.
H12: The Income/Outcome® simulation will positively influence perceived balance sheet generation skills development.
H13: The Income/Outcome® simulation will positively influence perceived budget creation skills development.
H14: The Income/Outcome® simulation will positively influence perceived cash flow forecast skills development.
H15: The Income/Outcome® simulation will positively influence perceived cash flow management skills development.
H16: The Income/Outcome® simulation will positively influence perceived break-even analysis skills development.
H17: The Income/Outcome® simulation will positively influence perceived ratio analysis skills development.

METHODOLOGY/RESEARCH DESIGN

INCOME/OUTCOME® SIMULATION PROCEDURAL SET-UP

Executive MBA students (N=876, M_{age}=38, Female=42%, $M_{years\ of\ work\ experience}$=16, $M_{years\ of\ management\ experience}$=8, 100% with an undergraduate degree, and 100% response rate) from Kennesaw State University experience the simulation during a 2-day opening residency. The residency is specifically designed to provide the business acumen foundation needed for future courses. The simulation itself is foundational in nature and is not intended to replace more advanced knowledge and skill development. Future lectures and experiential activities in the program build upon the foundational knowledge and skills developed here. The simulation itself is not part of the students' overall grade by design so students can concentrate on the learning aspect of the residency versus worrying about what grade they may receive. The EMBA faculty team constructs 5-6 teams of 6-7 students per team (ideal class size of 35-45) in which the team make-up is based on the students' DiSC profile (required before the opening residency begins), the students' work experience, managerial experience, functional business area, and current operating industry. Each student is then asked to fill out a pre-simulation survey (found in Appendix A) and turn it in to the facilitators (EMBA faculty members) before the simulation can begin. The faculty then introduce the simulation, provide the learning objectives and rules, and outline the structure of the simulation. Each team is instructed to assign roles to each member

(finance, marketing, sales, accounting, operations, and management) and informed that the members can switch roles during the simulation as needed.

Designed by Andromeda Training, Inc., Income/Outcome® is a high-touch enterprise management game intended to jumpstart business acumen skill development by creating a cross-functional visual learning approach. The visual learning approach is a type of learning style where students can utilize the simulations' game board to see and recall the information in order to learn it. The objects on the board can be easily visualized. In Figure 1, the visual learning approach is seen in the Income/Outcome® game board where the company is represented as a whole by the different functional areas. This visualization allows them to more accurately complete skill tasks such as an income statement and balance sheet since the information visually in front of them. The simulation also allows for students to understand the connections between each area of an operating company by immersing them in a teaming exercise designed to demonstrate decision-making outcomes on financial performance while providing cross-functional development via experiential pedagogy over a 12-year time cycle (or over the course of a day and a half). The simulation length is designed to fit in to the 2-day residency and is adequate time to keep the students focused while providing the right time frame for foundational knowledge and skill development. The simulation can be extended to 3 full 8-hour days, but faculty felt that the needed foundational information could be acquired in the day and a half format and student feedback has indicated that this time frame is just enough to hold their attention and that more residency time would take time away from their work schedule.

Figure 1: Income/Outcome® game board

This strategic decision-making simulation takes students from the start of a business to full growth where they are making research and development (R&D), production, sales, marketing, management, accounting, and finance decisions while experiencing a competitive

environment and employing optimal game theory choices for the team to achieve success and the business to thrive. We take the learning process one step further by employing a collaborative team-teaching model where not only do instructors from each of the functional areas teach specific topics within the simulation timeframe but also work together to demonstrate how each functional area impacts the others. There are 6 "shadow" rounds of the simulation where the faculty walk the teams through the procedure of running a company and provide small lectures on the different functional areas such as finance, accounting, and marketing before the 7th round where the teams are given a specific checklist and must go through it on their own through round 12. Figure 1 provides a typical "run" of the simulation from start to end. Team members work together to address supply and inventory issues along with working capital and cash flow situations. The team starts with the R&D process moving through marketing, sales, and production onto completing financial statements to track their position and performance in the marketplace all while dealing with the ability to operate as a strategic decision-making team and overcoming dysfunctional team dynamics. Teams are wholly accountable for their own results and make their shareholder reports to the class at the end of each business cycle and a debrief of all the results is provided by the teaching team as well as a discussion on what went right, what went wrong, and how decisions can be made differently going forward to improve results. Information such as amount sold, sales strategy, cash flow and budget analyses, and financial indicators are presented and then discussed amongst the groups before the next round begins.

Figure 2: Simulation Program Run

Format	Face-to-Face
When conducted	Start of Program
Simulation Length	1 day and ½
Simulation Rounds and Run Time	Shadow Round 1: 15 min Shadow Round 2: 20 min Shadow Round 3: 25 min Shadow Round 4: 30 min Shadow Round 5: 55 min Shadow Round 6: 35 min Round 7: Briefing=20 min; Planning and Decision-Making = 75 min; Round Results and Debrief = 30 min Round 8: Briefing=20 min; Planning and Decision-Making = 65 min; Round Results and Debrief = 20 min Round 9: Briefing=20 min; Planning and Decision-Making = 50 min; Round Results and Debrief = 20 min Round 10: Briefing=10 min; Planning and Decision-Making = 40 min; Round Results and Debrief = 20 min Round 11: Briefing=10 min; Planning and Decision-Making = 30 min; Debrief = 10 min Simulation Debrief and Tiebacks: 30 min

This activity has been designed so that students gain an "understanding of how and why their everyday decisions and actions impact other areas of the company" (Andromeda Training, Inc., 2023). The lectures and discussions clarify the function of each department and how the actions of one area affect the others while demonstrating the need for functional areas in a business to collaborate on decisions. This big picture approach allows students to fully understand the inner workings of a business and the cross-functional learning is immediately applied as all students are required to prepare an income statement and balance sheet, create a budget and cash flow analysis, apply for financing based on a cash flow analysis, create a business strategy, and forecast sales and loans. No new round is allowed to begin until all students on every team have successfully completed an income statement and balance sheet for that round as well as a complete financial analysis of where their company currently stands. This provides a true action learning encounter for the students and greater thoughtfulness in the decision-making process; thus, the learning and retention process is increased. Once the game has concluded, the faculty team asks each student to complete and hand in the post-survey before they leave.

RESULTS

A casual view of the data shows, overall, that perceived knowledge and skill indicators increased over the life of the simulation. Table 1 displays frequency percentage of each knowledge and skill indicator as well as mean score for the pre-survey and table 2 shows the post-survey data. On average, Coles College of Business students' confidence perceptions of their foundational business knowledge and skill base was greater after the completion of the simulation. The frequency percentage for slightly confident to mostly confident in all knowledge and skill indicators grew from the pre-survey to the post-survey indicating that there may be greater perceived skills in the functional areas of business after completing the Income/Outcome® simulation. The main knowledge indicators that students felt unconfident with were finance and accounting and the skills associated with those functional areas such as income statement generation, cash-flow forecasting, break-even analysis, and ratio analysis with mean scores of less than 2 showing that on average, most students felt that they were mostly unconfident or slightly unconfident in their knowledge or skill abilities. Management knowledge and the strategic-thinking skill had the highest pre-survey mean scores (3.11 and 3.03) indicating that most students felt at least slightly to mostly confident in their knowledge and skills.

Table 1: Pre-survey data						
Knowledge/Skill (K/S)	**Mostly Unconfident Freq %**	**Slightly Unconfident Freq %**	**Neither Freq %**	**Slightly Confident Freq %**	**Mostly Confident Freq %**	**M Score**
Finance (K)	40.53	32.76	23.17	2.17	1.37	1.91
Accounting (K)	37.90	34.47	23.86	2.51	1.26	1.90
Marketing (S)	25.57	23.63	22.03	24.89	3.89	2.52
Sales (S)	24.66	26.37	22.26	23.97	2.74	2.42
Management (K)	18.38	22.72	26.83	26.94	5.14	3.11
Operations (S)	20.89	23.74	25.23	25.91	4.22	2.51
Negotiations (S)	24.66	24.09	22.60	23.97	4.68	2.44
Strategic Thinking (S)	30.37	25.00	19.29	21.58	3.77	3.03
Strategic Decision-Making (S)	28.88	24.09	23.40	18.15	5.48	2.94
Income Statement Generation (S)	38.13	33.45	25.11	2.05	1.26	1.90
Balance Sheet Generation (S)	37.67	33.11	25.46	2.17	1.60	1.90
Budget Creation (S)	38.36	33.68	25.00	2.05	0.91	1.90
Cash Flow Forecast (S)	40.75	33.90	21.80	2.40	1.14	1.91
Cash Flow Management (S)	41.67	32.42	22.15	2.51	1.26	1.90
Break-Even Analysis (S)	37.90	34.36	24.60	2.17	1.37	1.90
Ratio Analysis (S)	40.64	32.88	22.95	2.40	1.14	1.91

Table 2: Post-survey data						
Knowledge/Skill (K/S)	**Mostly Unconfident Freq %**	**Slightly Unconfident Freq %**	**Neither Freq %**	**Slightly Confident Freq %**	**Mostly Confident Freq %**	**M Score**
Finance (K)	33.76	29.00	32.42	3.88	1.94	2.42
Accounting (K)	31.28	30.71	32.31	3.54	2.17	2.43
Marketing (S)	23.97	20.89	22.95	25.57	6.62	2.72
Sales (S)	20.89	26.83	22.95	24.54	4.79	2.65
Management (K)	13.81	21.35	28.54	28.20	8.11	3.16
Operations (S)	14.16	20.43	29.34	28.77	7.31	2.72
Negotiations (S)	17.81	21.46	27.51	25.57	7.65	2.66
Strategic Thinking (S)	25.46	21.12	23.06	24.09	6.28	3.07
Strategic Decision-Making (S)	24.54	20.43	26.14	21.12	7.76	3.01
Income Statement Generation (S)	29.34	30.25	34.36	3.65	2.40	2.43
Balance Sheet Generation (S)	30.71	29.11	33.22	3.88	3.08	2.43
Budget Creation (S)	28.77	30.94	35.84	3.20	1.26	2.43
Cash Flow Forecast (S)	27.63	31.28	35.16	3.88	2.05	2.42
Cash Flow Management (S)	27.74	31.62	34.13	4.68	1.83	2.42
Break-Even Analysis (S)	29.00	31.96	32.88	4.00	2.17	2.43
Ratio Analysis (S)	29.91	31.28	32.53	4.23	2.05	2.42

Table 3: Pre- to Post-Survey Data analysis						
Knowledge/Skill (K/S)	**Mostly Unconfident % Change**	**Slightly Unconfident % Change**	**Neither % Change**	**Slightly Confident % Change**	**Mostly Confident % Change**	**M % Change**
Finance (K)	-19.15	-11.50	39.90	78.95	41.67	26.70*
Accounting (K)	-17.47	-10.93	35.41	40.91	72.73	27.89*
Marketing (S)	-9.82	-15.94	1.04	2.75	70.59	7.93*
Sales (S)	-15.28	1.73	3.08	2.38	75.00	9.50*
Management (K)	-24.84	-6.03	6.38	4.66	57.78	1.60
Operations (S)	-32.24	-13.94	16.29	11.01	72.97	8.36*
Negotiations (S)	-27.78	-10.90	21.72	6.67	60.98	9.01*
Strategic Thinking (S)	-16.17	-15.53	19.53	11.64	66.67	1.32
Strategic Decision-Making (S)	-15.02	-15.17	11.71	16.35	41.67	2.38
Income Statement Generation (S)	-23.05	-9.56	36.82	77.78	90.91	27.89*
Balance Sheet Generation (S)	-18.48	-12.07	30.49	78.95	92.86	27.89*
Budget Creation (S)	-25.00	-8.14	43.38	55.56	37.50	27.89*
Cash Flow Forecast (S)	-32.21	-7.74	61.26	61.90	80.00	26.70*
Cash Flow Management (S)	-33.42	-2.46	54.12	86.36	45.45	27.36*
Break-Even Analysis (S)	-23.49	-6.98	35.85	84.21	58.33	27.38*
Ratio Analysis (S)	-26.40	-4.86	41.79	76.19	80.00	26.70*

*$p < .05$

Average % Change: 17.90%

The post-survey results show that the mean score for management knowledge and the strategic-thinking skill did grow (3.16 and 3.07) but it was the accounting and finance knowledge and skill areas that saw the greatest increase with mean scores growing from on average 1.90 to an average of 2.42. Even though both these functional areas remain in the slightly unconfident area, the perceived growth in knowledge and skills seems to be achieved. Table 3 shows the average percentage change in the knowledge or skills area from the pre-survey to the post-survey. When the pre- and post-survey results are analyzed, on average, there is a 17.90% increase in all perceived knowledge and skills as a result of the simulation. While each variable did see increases over time from the pre- to post-survey, the income statement and balance sheet generation scores were the highest percentage change (34.58% and 34.34%) of all indicators. If each variable is compared over the 5 indicator answers, the greatest increases can be found in the cash-flow management and break-even analysis skills. This makes sense given that each round of the simulation requires that each student complete an income statement, balance sheet, cash-flow forecast, and break-even budget analysis and the next round is not allowed to start until every student on each team is finished with each of these tasks. The results indicate that overall, the greatest increases come in the accounting and finance areas. The analysis of the surveys indicates that there is a favorable increase in perceived foundational knowledge and skill development

with completing the simulation and that learning productivity increased for these adult EMBA learners just over the life of the simulation.

We then test the various hypotheses using a t-test to determine if our casual interpretation of the results are indeed indications that EMBA students' business knowledge and skills have been effectively attained due to the simulation. The t-test is appropriate when the two variables are from the same population and to determine if there is a significant difference between the means of the pre- and post-survey responses. The results show the with a t-value of 3.383 and a corresponding two-tailed p-value of 0.0044, there is a significant difference in the overall means between the pre- and post-surveys indicating that students perceived that their business knowledge and skills had increased because of the simulation. Table 4 presents the complete set of results for all hypotheses tested.

Table 4. Summary of Model Hypotheses

Hypothesis	Two-tailed P-value	Supported
H1: sim → knowledge & skill development	0.00445	Yes
H2: sim → finance knowledge development	0.00181	Yes
H3: sim → accounting knowledge development	0.00199	Yes
H4: sim → marketing skill development	0.00791	Yes
H5: sim → sales skill development	0.00174	Yes
H6: sim → management knowledge development	0.23847	No
H7: sim → operations skill development	0.00371	Yes
H8: sim → negotiations skill development	0.00396	Yes
H9: sim → strategic-thinking skill development	0.52325	No
H10: sim → strategic decision-making skill development	0.30308	No
H11: sim → income statement generation skill development	0.00129	Yes
H12: sim → balance sheet generation skill development	0.00142	Yes
H13: sim → budget creation skill development	0.00145	Yes
H14: sim → cash flow forecast skill development	0.00126	Yes
H15: sim → cash flow management skill development	0.00119	Yes
H16: sim → break-even analysis skill development	0.00149	Yes
H17: sim → ratio analysis skill development	0.00191	Yes

*$p<0.05$

When the t-test was run against the corresponding means from the pre- and post-surveys, all the hypotheses were supported except for H6, H9, and H10 showing the simulation had no significant effect on the perceived management knowledge development or skill development of strategic thinking or strategic decision making. This result is not surprising. EMBA students entering the program, on average, have 8 years of management experience. They enter with more management knowledge, strategic-decision making abilities and strategic-thinking skills. They already possess the foundation in this functional area, but they lack the knowledge and skills in the other functional areas. Of the support for the remaining hypotheses, there was a greater

significant difference for the finance and accounting variables. Variables such as cash flow forecast, and management (H14 and H15) had p-values (0.00126 and 0.00119, respectively) below all other variables. This trend continued with the other finance and accounting variables which again may make sense given many of the incoming EMBA students' work and education experience include no background in those functional areas. The greatest increase in perceived knowledge and skills was in the accounting and finance functional areas.

Many of the favorable results presented above are accomplished by taking the Constructivism Learning approach within the Income/Outcome® simulation where the faculty team are more of facilitators and the students are the active participants creating their own business acumen knowledge and skills. The significant results show that students perceive that the learning by doing of the income statement, balance sheet, budget creations, cash-flow forecasting, and break-even analysis allows them to quickly acquire working skills in the accounting and finance areas. The Income/Outcome® simulation allows our EMBA students to apply real world concepts in real world practice as well as help build their professional business skills.

Several studies have investigated student perceptions of skill attainment using simulations such as Miles et. Al 1986, Lacruz and Américo 2018, Brazhkin and Zimmerman 2019, Kiss and Schmuck 2021, and Huang et al. 2022. Each one supports the conception that business skills can be acquired using a simulation and that perceived learning does indeed occur. These studies are similar to this one based on the overall goal of determining whether student perception led to skill attainment and thus learning but they differ in approach and theory as well as student attributes. The main difference is the age range and education level. A study by Jhan et al. (2023) explains the highly interactive nature of EMBA students in their decision-making abilities and the need for instructors to design action learning environments to meet those needs. The previous mentioned studies focus solely on undergraduate learners who have different learning attributes. Thus, this study contributes to the knowledge base by focusing in on adult graduate level students whose learning attributes differ from undergraduate students. The results provided paint a convincing indication that a Coles College of Business EMBA student's ability to apply the material and acquire foundational business skills was influenced through the Constructivism Learning/action learning process and the effectiveness of the simulation. These findings are encouraging when viewed in a multi-dimensional analysis. One notable observation came from Chai et al. (2017) who proposed educational programs' improvement can come about with a better understanding of students' perceptions of learning; thus this study aides in that assertion that our EMBA students' perceive that they have attained foundational business knowledge and skills using the simulation and the ability to integrate learning and application of materials, which is the core competency of this EMBA program, is achieved using an action learning environment and a collaborative faculty teaching approach.

CONCLUSIONS

This study aims to provide evidence of the effectiveness of the Income/Outcome® simulation in an action learning environment where non-traditional classroom curriculum using a

collaborative faculty team teaching model attempts to integrate functional business areas and provide a deeper skill base for adult learners such as EMBA students. Published studies presented above provide evidence that Executive MBA Programs benefit greatly from the transition from traditional teaching methods to action-based experiential learning as it bridges the gap between theory and practice and allows adult EMBA learners to absorb and apply business acumen knowledge much quicker thus meeting their demands in the classroom (Jhan et al. 2023). After completion of the simulation, EMBA students' perception of their foundational business knowledge and skills increased on average 18%. The largest increases came in the accounting and finance areas which corresponds to the average EMBA student not having a background in those areas and struggle with increasing their knowledge and skills quickly in a fast-paced program.

One of the many Coles College EMBA students who completed the simulation said "I was very impressed with the Income/Outcome® game. It was a fun and innovative way to learn how all the functional areas of business are tied to and work together. The interactive approach to planning and decision-making in a simulated manufacturing environment really made the understanding come alive for me." Another provided this insight: "The simulation during the opening residency provided a great experience for me to start connecting the dots for the financial statements, especially the components on financial analysis, where I learned how to understand, interpret, and make decisions from a company's financial statements (income statement, balance sheet, and cash flows)." While the student feedback has been mostly positive, several students throughout the years provided constructive feedback that the simulation was difficult to relate to because it was not similar to their industry or was not service related. This made it difficult for the students to fully engage in the process and more examples of how this works in their industry or line of work would be helpful. Finally, a new faculty member who had just concluded his first team-teaching of the Income/Outcome® game said it best: "I was hesitant on collaborating with other faculty as I thought it would take away from my lecture time but I found it only enhanced the material I delivered and to see the student results from that collaboration and the simulation as well as the enjoyment I received from team-teaching, I am sold of this type of interaction with students." This study concludes with a recommendation for all EMBA programs to integrate game-based action learning into their programs to effectively increase student learning as well as perceived foundational knowledge and skill levels.

LIMITATIONS AND FUTURE RESEARCH

The results do provide an assurance that the Coles College of Business EMBA students perceive that foundational skills and knowledge have been acquired as a result of the Income/Outcome® simulation, however, limitations of this study are time and faculty. The literature shows that faculty have reported that using a management simulation up front takes away valuable teaching time and collaboration amongst faculty members can be difficult to achieve without deliberate intent and a willingness to move beyond conventional teaching methods. This study shows that both are possible to overcome. Faculty must be open to collaboration for this simulation to be successful. This has been achieved in the Kennesaw State

University EMBA Program by making team-teaching a requirement if one wants to teach in the program. By introducing these concepts through game-based action learning up front and using a team-teaching approach, students can absorb and apply concepts much quicker because they can see the integration of areas through team-teaching and achieve those foundational skills easier through learning by doing. The implications of this study suggest that an introductory management simulation is beneficial and effective in providing a foundational advantage for EMBA students that lack a business undergraduate degree.

Another limitation offered by another study (Lacruz & Américo 2018) is the lack of a control group. In that study, two groups went through the simulation but only the experimental group was exposed to a debriefing. This study had a debriefing session after each round and no control group was used. This potentially could provide stronger evidence for the effectiveness of the simulation in skill attainment if two groups could be compared. Furthermore, this study may benefit from investigating the effectiveness of the simulation to different sub-groups within the large sample that was not previously investigated. The sample could be spilt into separate classes and examine the perceived skill development and learning to exhibit potential increases or decreases over each cohort. Finally, the surveys done were completely anonymous thus we could not separate the sample into demographic or attribute sub-groups such as holding a business undergraduate degree versus not.

One area of this study not presented is the effect that team dynamics may have on the learning or on the perceived knowledge or skill attainment. In this case, learning may also increase when it is collective learning and team dynamics are such that it aids in the learning environment. Future research opportunities include incorporating teaming dynamics into the perception analysis to see if the overall learning environment is enhanced.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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APPENDIX A: LIKERT SCALE PRE- AND POST- INCOME/OUTCOME® SURVEY QUESTIONS

Rate your Knowledge/Skill (K or S) Level for the following 16 business concepts.

	Survey Question	Mostly unconfident	Slightly unconfident	Slightly confident	Mostly confident	Completely confident
1	Finance (K)					
2	Accounting (K)					
3	Marketing (S)					
4	Sales (S)					
5	Management (K)					
6	Operations (S)					
7	Negotiation (S)					
8	Strategic Thinking (S)					
9	Strategic Decision-Making (S)					
10	Income Statement Generation (S)					
11	Balance Sheet Generation (S)					
12	Budget Creation (S)					
13	Bash Flow Forecast (S)					
14	Cash Flow Management (S)					
15	Break-even Analysis (S)					
16	Ratio Analysis (S)					

IMPROVING STUDENT ENGAGEMENT IN ONLINE COURSES WITH VIDEO EXERCISES: A PILOT STUDY

Robert Stevens, Southeastern Oklahoma State University
Lawrence Silver, Southeastern Oklahoma State University
Rhonda Richards, Southeastern Oklahoma State University
Raymond Bomgardner, Southeastern Oklahoma State University

ABSTRACT

Online education has grown at a rapid pace in the last few years as more universities develop programs to reach the online community and to offset declines in on-campus attendance. In some cases, this has allowed universities to reach entirely new market segments. The growth of online learning presents several challenges for educators. One of these is that the online environment has brought with it a need to achieve the same learner engagement that is available in a face-to-face or hybrid format. This research addresses the issue of increasing engagement through the use of video exercises where a video link is given to learners along with questions to answer related to the material in the video. Results from the study found that students reacted favorably to the video exercise; the implications from the findings are presented.

Keywords: *online education, technology and student engagement*

INTRODUCTION

Designing online courses to adequately engage students is a continuing problem for educators (e.g., Dixon, 2010; Martin & Bolliger, 2018; Muir, et al., 2019). With online education increasing most recently due to the Covid 19 Pandemic, the methods used to engage students to learn have changed as well and those changes have led to promising results (Zhu, et al., 2022). Lederman (2018) reported that in 2016 there were over six million students in the U.S. enrolled in at least one online course, and the proportion of students enrolled in courses has risen to over 30% (Lederman, 2018). Enhancing the student's engagement in an online format has been a challenge for educators. Methods to enhance student engagement in an online environment include peer-to-peer interactions such as discussion boards, instructor-to-student interactions such as video lectures and feedback on assignments, and digital learning tools such as videos and simulations.

This paper presents exploratory research on using subject matter videos in place of traditional discussion boards in order to enhance student engagement in an online, graduate level asynchronous management course at a small, mid-western university. The paper is organized as follows: First is a literature review of student engagement in online learning that specifically addresses discussion boards and content-based videos. Next, the methodology used to conduct

the study is explained as well as the findings. Finally, the authors discuss the implications of the findings and possible areas of future research.

LITERATURE REVIEW

There are several strategies instructors can use to enhance student engagement in online courses. This engagement is multifaceted because not all students will react in the same way to a particular engagement strategy (Fredericks, Blumenfeld, & Paris, 2004). Additionally, student engagement is not a discrete function, but rather on a continuum. (Robinson & Hullinger, 2008). Factors other than pedagogical strategies that affect student engagement include work-life balance, life commitments for online learners, and the weekly course workload (Tracey, et al. 2019). Thus, student engagement is complex and varies from student to student. With the increase in online learning, however, it is important to continue to explore ways to make the online classroom interesting and relevant to students.

Student engagement is important because it helps motivate students to learn, enhances student satisfaction, and improves student performance (Martin & Bolliger, 2018). While most researchers agree on the importance of engagement, different researchers have found conflicting results. For example, Dixson (2010) found that instructors need to use multiple strategies to engage students and that discussion boards and videos were equally valuable. On the other hand, Tracey, et al. (2019) found that peer-to-peer interaction through discussion boards was not as valued by students as instructor-student interaction which included videos. Similar results were reported by Martin and Bolliger (2018), in their study, students rated video lectures and other videos were considered more valuable to learning than discussion boards. This was particularly true when the videos were relevant and applied to the "real world." In addition, Zhu, et al. (2022) found that adding short videos to class content increased student engagement as well as final exam scores.

The goal of discussion boards is for students to co-create knowledge. Darabi & Jin (2013) found that students use discussion boards for comparing and exchanging basic facts rather than developing creative solutions to problems or engaging in critical thinking. Some discussion boards are too structured and some lead to problems causing student cognitive overload (Darabi & Jin, 2013). Many students also fail to respond to other students' posts and post opinions and facts to meet the requirement for the number of posts (Hall, 2015). Additionally, as the size of some online classes approach one hundred or more students, the logistics of grading discussion boards becomes difficult.

This paper concentrates on "learner-to-content" engagement which is defined as the process of intellectually interacting with the course content and that changes a student's understanding and perspective (Bernard, et al., 2009). Video exercises are a form of learner-to-content student engagement strategies. The video exercises were developed to address some of the challenges observed when using the traditional discussion board.

This paper does not argue that discussion boards are ineffective and should be abandoned. Rather, because of the problems of designing an effective discussion board and the increasing size of classes, this paper hypotheses that video exercises may enhance student

engagement and interest in a more efficient manner. Particularly, video engages students both emotionally and intellectually (Carmichael, Reid, & Karpicke, 2018).

METHODOLOGY

For this study, two graduate MBA elective/ required, and first/second year courses were used as the study environment; one in strategic management and one in business research. A video exercise was developed for each week of the 7-week online courses and was used to replace the weekly discussion board posts used in the course. The videos were selected from hundreds of, Americans with Disabilities Act (ADA) compliant, teaching videos related to business research and strategic management that are available on YouTube with three criteria in mind:

1. The video had to be well done and relate to a specific topic covered in the week's reading material.
2. The video had to be relatively short (5- 12 minutes) to make it manageable for the learners who may need to view them more than once.
3. The video had to lend itself to the development of questions that a learner could give a specific response to for assessment.

Learners were required to view the video and post on a Discussion Board their responses to the questions each Wednesday by 11:59 and though not required, they could post comments about other learner's responses to the video. The video exercises were related to the foundational concepts that were introduced during the week. For example, during week 1 of one of the strategic management courses, students were introduced to the steps involved in the strategic planning process. During week 2, students were introduced to how to write a vision statement. Students would use information from the video to provide a detailed analysis that could be used to help them answer the discussion question for the week. Students would also be able to corollate information from the textbook and the video to help them further develop their initial post to the discussion question. The length of the initial comments for the questions in the discussion could vary, however a 250-word answer was generally acceptable. Students were assessed by the instructor and an academic coach and scored with a maximum value of 10 points.

A survey link was sent to each student enrolled in the course after the last video assignment for the term and was asked to complete the brief survey and make any comments they wanted about the use of the video exercises in an open-ended formatted question. A 7-point Likert type scale was used for the questions rated to the efficacy of the video as a learning experience. The scale was anchored with 0 as "Strongly Disagree" and 7 as "Strongly Agree."

Of the 151 learners enrolled in the two courses, 91 responded to the survey, yielding a 60.3% response rate. The descriptive statistics for the respondents, showed 54% to be females and 43% males; also 86% or 78 respondents work full-time. The data also reported that 47% of the respondents stated that they allocate 11-15 hours per week to the sampled coursework.

SPSS software was used to analyze the resulting data. The analysis produced means, medians, and percentages where appropriate with the results shown in the tables below.

FINDINGS

A wide range of research uses various applications of data science to explore the relationships between dynamic and static variables. For this study we used a survey as our measure of examination. Our interest is using the online learning environment, a dynamic learning arena, to examine whether a graduate student could engage course content at the same level of achievement using video links with questions and answers, as was evident in a face-to-face or hybrid format. The results of our analysis are as presented.

The results from the survey are presented in a question-by-question format below in Table 1. Crosstabs were also run on the data to identify differences in response patterns.

Table 1
Questions with Likert Scale Rankings

Question 1: The video exercises aided in my understanding of the required reading material.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
0	2	3	11	11	25	39
Weighted Average		*5.88/7.00*				
Question 2: The video exercises motivated me to look at other material related to the video exercise.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
6	1	7	11	22	18	26
Weighted Average		*5.20/7.00*				
Question 3: The video exercises were a worthwhile learning experience.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
1	1	8	5	12	22	41
Weighted Average		*5.84/7.00*				
Question 4: The video exercises added more depth to the material in the text.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
5	0	6	4	11	23	40
Weighted Average		*5.75/7.00*				
Question 5: The length of the videos made the videos manageable.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
0	0	0	1	7	17	65
Weighted Average		*6.62/7.00*				
Question 6: A larger number of video exercises for each chapter would have been beneficial.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
9	10	9	22	19	8	12
Weighted Average		*4.17/7.00*				

Question 7. I like the video exercises better than the usual discussion board posts.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
2	0	1	6	10	26	45
Weighted Average		*6.11/7.00*				
Question 8: I would like to see more courses use video exercises in their course material.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
0	1	2	8	14	22	44
Weighted Average		*6.04/7.00*				
Question 9: I think the video exercises should have been assigned more points per exercise.						
Strongly Disagree	Moderately Disagree	Slightly Disagree	No	Slightly Agree	Moderately Agree	Strongly Agree
3	3	5	28	13	22	17
Weighted Average		*4.97/7.00*				

Table 2 gives descriptive statistics for the sample size of 91 respondents.

Table 2
Descriptive Statistics

Gender	Male	Female	Prefer not to answer
	43% (39)	54% (49)	3% (3)
Which statement best describes your current work situation?			
Full-time student	Work part-time	Work full-time	
12%	2%	86%	
11	2	78	
During a typical week, about how many hours did you spend per week on course work for this course?			
Less than 10 hours per week	33%	31	
11-15 hours per week	47%	44	
16-20 hours per week	16%	15	
Over 20 hours per week	4%	4	

The analysis of the findings from using the Likert Scale are noted in Table 3. The learners were split into two groups with Favorable" having a sum of 51 or above and "Unfavorable" with a sum of 51 or below. The sum was taken from the 9 Likert scale questions. There were 51 in the "Favorable" group and 40 in the "Unfavorable" group.

Table 3 **Analysis of Total Scores**		
		Frequency
Valid	*More Favorable*	*51*
	Less Favorable	*40*
	Total	*91*
Missing	*System*	*1*
Total		*92*

A chi-square test was performed on the data with results in Table 4 below. The only significance found with the relationship between "Favorable/Unfavorable" and Time Spent on Coursework. Those who spent more time on course work had more favorable attitudes toward the video exercises.

Table 4
Analysis of Results using a Chi-square Test

Chi Square Test Favorable/Unfavorable Based On:	Pearson Chi-Square Value/df/Sig	Likelihood Ratio Value/df/Sig	Linear-by-Linear Association Value/df/Sig	N of Valid Cases
Gender	4.023/2/.134	5.131/2/.077	.481/1/.488	91
Work Situation	4.023/2/.134	5.131/2/.077	.481/1/.488	91
Time spent on Coursework	12.666/3/.005	13.149/3/.004	1.569/1/.210	89
Watching Television	1.406/2/.495	.1780/2/.411	.316/1/.574	90
Time spent on Social Media	.265/2/.876	.71/2/.876	.112/1/.738	85
Time spent on Video Games	1.296/2/.523	1.667/2/.434	1.181/1/.277	90

STUDENT COMMENTS ON THE VIDEO EXERCISES

The questions associated with the video exercise need more depth. The grading required students to go well beyond just answering the questions and having questions that asked for more depth would have made that easier.

The question about rhetorical questions seemed unrelated to the week 7 exercise. I also thought the video was much vaguer than the rest.

I have never liked discussions until this class. I was able to apply what I learned in the video and did not have to come up with a repetitive response to my classmates.

I appreciated the video exercises because it was the only thing, besides us, that taught the material. With no actual teaching from Professor's, videos like these are helpful. They were short and sweet and taught the concepts very well.

Great material, loved the setup of this course, aside from weight of quizzes and only one attempt.

Over the course of the last 6 weeks, I have continuously commented on how much the video assignments have been an exceptional element in further learning the weekly concepts.

Videos would be better if they were the professor and not just randomness off the internet.

I found the videos to be a good tool for better understanding the material. Probably because I'm an older student and my learning style prefers interaction with Professor's. Though I couldn't interact with the video, I could watch it again and pick up any key points that I may have missed. The video also caused me to use my textbook more but aided in my understanding of some concepts.

The word cloud shows in Figure 1, in terms of the pedagogical nature of the comments, that material, learning, depth, and understanding were all prominent. This is consistent with the findings that most students viewed the video exercises as favorable.

Figure 1
Qualitative Results of Student Comments

DISCUSSION AND CONCLUSIONS

As is shown in the findings above, most students liked the videos and thought they were a valuable learning experience. Most felt that the number of video exercises and length were good and with a few exceptions, felt they provided a valuable learning experience, added to their knowledge of the text material, and hoped that other courses would adopt this concept. There are, of course, pros and cons of using video exercises.

Pros:

1. Creates a different perspective on the course material than what is in the text.
2. In the business research course, the video creates the opportunity to demonstrate some of the newest data collection techniques, like neurodata.
3. Questions used for assessment can be varied from term to term and newer videos can replace ones that are out of date.
4. Videos enhance the learning experience for visual learners.
5. Videos provide a different experience than the usual discussion boards used in many online course formats.

Cons:

1. The videos can become outdated and would need to be regularly updated.
2. Instructors need to understand that the video exercises are just one tool for student engagement.
3. Some videos are preceded by ads, especially those from YouTube.

These results indicate that videos are a valuable tool for increasing student engagement. However, the drawbacks noted above will need to be addressed by instructors. Additionally, this exploratory study does not directly compare the student engagement level of videos as compared with discussion boards or some combination of videos and discussion boards. Researchers may want to address these issues in the future.

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