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Welcome to this issue of the *Business Education Innovation Journal*.

The purpose of this journal is to assemble researched and documented ideas that help drive successful learning and motivate business students to learn. The intention is to draw ideas from across both methods and disciplines and to create a refereed body of knowledge on innovation in business education. As a result, the primary audience includes business education faculty, curriculum directors, and practitioners who are dedicated to providing effective and exciting education.

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Business Education Innovation Journal

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An Empirical Analysis of Video Games and Social Media on Learning in an Information Systems University Class

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ABSTRACT

Prior research by Brau, et al. (2016, 2017) identifies factors that correlate with university student course grades. We employ the same research structure as the Brau, et al. papers with the innovation of adding dozens of questions that deal with video game and social media usage. Extant research argues that time spent on video gaming and using social media can: 1) hurt student grades, 2) help student grades, or 3) have no impact on student grades. We test the video game and social media impact hypotheses using a survey of over 500 college students in an Introduction to Information Systems course at a large, private, US university. Methodologically, we employ univariate and multivariate testing with course grade as the dependent variable and a set of video game, social media, and control variables as independent variables. Our results indicate that for this sample period (2019-2020), neither video game usage nor social media usage significantly impact learning as measured through course grades.

Keywords: Video games, Social media, Human computer interaction, Learning

INTRODUCTION AND BACKGROUND LITERATURE

Video gaming has long been glorified (Adachi and Willoughby, 2013) and vilified (Anand, 2007; Burgess, et al. 2012; Hauge and Gentile, 2003) with regard to its direct or indirect effect on academic performance. For example, researchers have found a negative correlation between the amount of time teenagers spent playing video games and measures of academic performance, like grade point average (GPA) and standardized aptitude test (SAT) scores (Anand, 2007). However, researchers have also found that playing strategic video games actually increased problem solving skills, which in turn predicted increased GPA (Adachi and Willoughby, 2013).

For better or worse, with the advent of the ubiquitous smart device and app store culture, video gaming is now a prevalent component of daily routines for youth and young adults, with 90% of teenagers reporting that they play video games (Anderson and Jiang, 2018). Extensive research has been conducted to demonstrate the benefits and drawbacks of videogaming in the context of academic performance and gamification of learning (e.g., Rosario & Widmeyer, 2009; Cheong, Filippou, & Cheong, 2014; Frost, Matta, & MacIvor, 2015). Other studies show the impact of in-class gaming activities to increase learning (e.g., Brau, Gardner, McDonald, and Webb, 2019). What many studies unfortunately neglect is nomological completeness (i.e., omitted variable bias) in their models (Burgess et al., 2012; Hauge and Gentile, 2003). For example, the above mentioned Anand (2007) study linking time spent playing video games with lower GPAs and SAT scores fails to take into account known correlates of academic performance like personality (Noftle and Robins, 2007), sleep (Kelly et al., 2001), and socio-economic factors (Betts and Morell, 1999), among many others.

Beyond this, videogaming is now almost inextricably intertwined with social media platforms—with many games being delivered through the social media platform or leveraging social media integration in some other way—such that videogaming has taken a large step away from being a solo, antisocial activity (Dominick, 1984) to being a social enabler (Burroughs, 2014; Kirman et al., 2009). Therefore, any contemporary study that makes claims about the effects of videogaming will find it prudent to consider social media effects (Leung, 2015; Mingle and Adams, 2015).

Variables that have driven grades in prior studies include the positive correlates of: intelligence, drive, testing preference, finance assessment, math assessment, class size impacts, having a prior class in the area, and individual effort (Brau et al., 2016; Brau et al., 2017). Variables that are negatively correlated include: over-confidence, a traumatic experience during the semester, working a paid job, and taking the exam on the last day of the testing period (Brau et al., 2016; Brau et al., 2017). Because many videogaming studies are nomologically incomplete, not including the variables above, it is difficult to place confidence in their findings. There may be lurking variables introducing endogeneity concerns (Papies et al., 2017), and therefore inflating (or suppressing) any observed effects. Such a state of scholarship leads to the situations we see today with apparently conflicting results and recommendations. Therefore,

in this study, we report on a survey that included videogaming and social media. To the Brau et al. variables, we add over 50 questions related to video game activity and social media activity. The dependent variable for our study is the total semester course grade earned by each student.

We conducted this study in the context of an introductory Information Systems course at a large private university in the USA. We received responses from 546 students. Descriptive statistics indicate that 67% of the students in the class played video games during the semester. (For another study of an Information Systems class at this university, see Brau, Brau, and Keith (2020).)

Using multivariate models to control for variables that previous studies (e.g., Brau et al., 2016; Brau et al., 2017) have shown are correlated with course grade, we find that those students who played video games during the semester, and/or who used social media, did no worse and no better than those who did not play or use social media. Additionally, the length of time students played video games (for those who played) or used social media, indicated no significant impact on their course grade. These results indicate that the relationship between videogaming, social media, and academic performance is more nuanced than previous research would have us believe.

METHODS AND DATA

We use similar research strategy, empirical methods, and survey questionnaires as Brau et al. (2016, 2017, 2021, 2022), Brau, Holmes, and Israelsen (2019), Brau, McKinley, and Nelson (2022) and Brau, Ringwood, and West, (2020) and append approximately 50 questions dealing with video games and social media. Video game questions are expansive, ranging from the macro-level question, "Do you play video games" to micro-level questions such as gaming console, time spent, emotional state when playing, and even particular video games, among many others. Students were given extra credit to complete the survey. We had two questions during the survey to test their level of engagement. Our results are robust to the entire sample and to only those with high engagement measures.

The original survey instrument was beta tested with a group of 15 student employees, after which clarifying adjustments were made to the survey based on their input. We collected the data in the Fall 2019 and Winter 2020 semesters. Results are robust between the two semesters, which serves as a check on potential COVID-19 impacts. The Fall 2019 semester was mostly in-class, until classes went online due to COVID-19 in late March. For the Winter 2020 semester, the entirety of the course was online live remote.

Our methodological approach is to first analyze descriptive statistics, focusing on the variables from the survey that subsequently show univariate statistical significance with the dependent variable, course grade. We then report Spearman Correlations for these variables and highlight the video game and social media variables that have statistical significance. We also report the control variables that are significantly correlated with course average. Our next step is to estimate a series of multivariate ordinary least squares (OLS) models (i.e., line of best fit). We report three models, each with the dependent variable of course grade. Finally, we conduct robustness tests using other OLS specifications, as well as Tobit models, all of which are qualitatively similar to the models reported in the paper.

Table 1 provides definitions for the variables used in Table 2 and provides the questions asked of the respondents in the survey. Table 2 reports the descriptive statistics for variables that are statistically significant in subsequent pairwise correlation tests with course grade. The average grade in the class was 90.3%, an A-, indicating relatively high performance for this class. 66.9% of the students indicate that they play video games with an average session length of 1.7 hours. For those identifying gender, an average of 80.5% of men play video games and 38.9% of women play. The average ACT score is 28.6 with an average 3.8 high school GPA. 23.6% of the students are transfer students and the average college GPA is 3.62. 63.5% of the students are pre-business majors. This course is a prerequisite for all students applying to become business majors, and therefore includes students from a diverse set of (business) majors, and not just students intending to pursue a degree in IS. All business majors at this university are limited enrollment, so the grade earned in this class can be a crucial factor in the business major admissions process.

Table 3 lists the definitions for some of the key video game and social media variables of interest, providing the survey questions which are reported in the Table 4 descriptive statistics. On average, 80.0% of the students who play video games had prior to college, some form of video game parental regulation. Of those who play video games, the average starting age was when the student was 7.6 years old. The average hours played per week is 5.6 hours, with a minimum of 30 minutes and a maximum of 35 hours per week.

Most of the variables are scored on a 7-point Likert scale with 1 representing strongly disagree and 7 representing strongly agree. The variable with the highest score was 'playing video games when bored' (PLAYVID_BORED) with a mean of 5.76, representing an average of agreeing with this statement. The lowest scoring variable is the student 'having difficulty stopping playing video games' (PLAYVID_DIFFICULTSTOP) which has a score of 3.72, indicating average mild disagreement with this statement. The remainder of the descriptive statistics in Table 4 are left for the reader to peruse. The overall picture for the classes of students is that the average student is bright, pre-business, and plays video games.

In a mini-case study, we explored one particular student who spends an average of 35 hours a week playing video games. She (the student identified as female) earned a 94.1% course average, which is an A. She started gaming at age 8 and had parental regulation on her gaming. Her average length of session is four hours per sitting, and she marked 7 (strongly agree) that she plays when she is bored, lonely, and alone. She disagreed that she plays when depressed (3) or that gaming makes her happier (3). She also indicated that she plays alone (OthersWatchPlay = 1). This student indicated a 4, neutral, that it is difficult for her to stop, suggesting that she is purposely averaging 35 hours per week playing and it is not a compulsion. She also indicated that she was neutral that gaming interfered with her homework (PlayInterfereHW=4). Surprisingly, this student scored 25 on the ACT and 3.7 high school GPA, both considerably below the class average; and yet she earned an A in this class while spending 35 hours a week gaming. This student was taking 14 credit hours in the fall semester when she took the information systems class, which is considered a full load at this university (i.e., credit hours greater or equal to 12 is full time). The student was 22 years old, unmarried, Caucasian, did not use social media, attended class, learned well outside of class, and sometimes played games during class.

EMPIRICAL RESULTS

Table 5 reports the Spearman Correlation coefficients with course grade. The first two columns indicate variables that are significantly positively related with course grade at a minimum of the 90% confidence level. The first number for each variable is the Spearman Correlation, the second number is the p-value, and the third number is the sample size. The only exception to the significance inclusion rule is the first variable, PlayVid, which is not significantly correlated with course grade (r=0.04, p=0.3898). The third column includes the variables that have a negative significant correlation with course grade. The table indicates that 31 control variables have significant correlations, but the indicator variable for playing video games does not, providing some preliminary evidence that playing video games does not impact student course grades. Considering the social media variables, only 'using social media in class' (SmInClass, r=0.17, p=0.0012) has a significant positive correlation. This finding seems the opposite one would expect, but perhaps students confident enough to use social media during class already have a strong grip on the course material.

Among video game players, the third column indicates that four variables carry negative correlation with course grades. Video game session length (LengthSession) carries a correlation coefficient of -0.124 and a p-value of 0.0386. Playing video games while one is lonely (Lonely, r=-0.135, p=0.0235), playing video games while one is depressed (Depressed, r=-0.117, p=0.0507) and watching others play video games (OthersWatchPlay, r=-0.144, p=0.0166) all indicate negative correlation with course grades. As these results only capture bivariate results with no controls for confounding factors, they offer some preliminary evidence that these characteristics of video game players may earn lower grades; however, multivariate models are needed to control for omitted variable bias. For example, it may not be playing video games while depressed that is impacting grades, it may actually be the student experienced a traumatic event during the semester (Traumatic, r=-0.120, p=0.0144), which is actually driving poor grades. If we do not test the two variables simultaneously, we may falsely conclude that one or the other is the driving factor.

Given the discussion above, we now report multivariate tests. Table 6 includes an estimated OLS model with our primary variable of concern being the indicator variable for if a student plays video games (PlayVid) and the dependent variable being the course grade. PlayVid is not significant, consistent with the Table 5 bivariate results. Variables that do matter at the 95% level (bolded in the table) are the student's university GPA (COLGPA), the student's assessment of their own subject matter skill (SubjectMatterSkill), and the student's assessment of their own motivation to achieve the course academic goals (CourseAcadGoals). Variance inflation factors indicate that multicollinearity is not a problem. The sample for Table 6 includes students who play video games and those who do not.

Table 7 reports the results of an OLS model that includes the subsample of students who play video games and uses the four variables that are statistically significant in the pairwise correlation tests as independent variables. Even

with no other control variables, none of these four variables are statistically significant at the 95% confidence level. Watching others play video games is marginally significant at the 90% level with a negative effect. However, this significance disappears in the next table when controls are included.

Table 8 expands Table 7 by adding the three most powerful control variables to the four video game variables examined in the prior table. None of the video game variables have a significant effect with this new specification. The two variables that matter are the university GPA and the student's self-assessed subject matter skill.

In unreported tests, we have estimated dozens of OLS and Tobit models to see if in any combination the video game and social media variables are significant. In our tests, they never are. We test Tobit models, because the course grade is truncated at zero and 102. Specifically, a student cannot earn a negative grade in this class and cannot earn above a 102%. (Students with a perfect score who did all extra credit could have earned a maximum of 102%.) Econometrically then, the Tobit is the correct specification to use. In no Tobit model do we find significance for video game or social media variables. We report the OLS results in lieu of the Tobit results for ease of interpretation by the reader (e.g., R^2).

LIMITATIONS AND FUTURE RESEARCH

Given the sample we surveyed for this study, there may be limitations in terms of generality. Some research discussed above has shown that video game and social media usage is negatively correlated with academic learning, or at least grades. One potential reason we do not find such a relationship is due to sample selection. Our students have all obtained admission to a competitive private college which turns away thousands of students each year. As Table 2 indicates, the average high school GPA is a 3.8 out of 4.0 and the average ACT is nearly 29 out of 36. These measures compare favorably with some of the most competitive universities in the country. When transfer students are taken out of the sample, the ACT score goes above 31 and the high school GPA approaches 3.9. Thus, for students at this level of academic achievement, we can say based on this study that using video games and social media does not lower their grade in this class. Perhaps these students have learned to balance their usage and still complete their studies at a high level. Care must be taken not to apply our findings to the population of students in general. Whereas our findings may generalize to other high-performing college students, they may not apply to other segments of students, including primary and secondary school-aged students.

Future research may focus on the robustness of our findings by studying longitudinal effects such as quarter versus semester verses year terms. Our sample consisted of 15-week semesters and may not generalize to shorter or longer terms. In addition, the course studied in this article is an introductory to information systems course. Further research could test the effects of video gaming and social media usage in more advanced or graduate level information system courses.

CONCLUSION

Our purpose has been to test whether video game and social media usage impacts the course grade for students in an introduction to information systems college class. In bivariate tests (correlations), four video game variables (out of dozens) are statistically significant: length of playing session, playing while lonely, playing while depressed, and others watching one play. All four are correlated with lower performance in the class. In a battery of OLS (three models reported) and Tobit specifications (no models reported), no video game or social media variable is significant with even minimal control variables. Given our sample and methods, there is no robust evidence that video game usage lowers course grades. With this in mind, professors teaching students similar to those in this sample may want to avoid any negative stigma or stereotype associated with video game playing among students. Perpetuating these assumptions of adverse effects associated with gameplay may only instigate guilt, hiding behavior, shame, and self-identification with poor performance. In our tests of social media usage, one variable is statistically significant in bivariate correlations: using social media in class, which is positively associated with course grade. In multivariate tests (none reported), no social media variable is ever significant. Therefore, banning device usage, including social media use in class, as has been done by professors in many universities, might not be worth the battle, since its use seems to have no real effect on academic performance.

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Table 1: Definition of Variables with Significance

Variable	Definition (All Likert Scales range from 1 (Strongly Disagree) to 7 (Strongly Agree)
AcadScholEver	Indicator variable = 1 if yes to "Have you received an academic scholarship?"
ACT	"What is the highest score you received on the ACT?"
BusMinor	Indicator variable = 1 if Minor to "Are you a Pre-business Major, Business Minor, or neither?" and 0 otherwise.
CloseWorker	Indicator variable = 1 if yes to "Do you have a parent, sibling, or close associate who works in this field?"
COLGPA	"What is your [this college] GPA (4.00 maximum)?"
CourseAcadGoals	Likert scale for "I am determined to do well in my business courses because I want to achieve my academic goals."
CourseBusCareer	Likert scale for "I am determined to do well in my business courses because I want to pursue a career in business."
CourseLearnNew	Likert scale for "I am determined to do well in my business courses because I am interested in learning new subjects."
Depressed	Likert scale for "I would consider playing video games if I felt depressed."
EmotionalFam	Likert scale for "I get the emotional help and support I need from my family."
Grade	The percentage grade earned in the course from instructor's gradebook.
HandleMany	Likert scale for "I feel I can handle many things at a time."
HSGPA	"What is your high school unweighted GPA (4.0 maximum)?"
Interest	Likert scale for "What is your personal level of interest in this class topic?"
LargeVsSmallClass	Likert scale for "I perform equally well in large classes and small classes."
LearnOutClass	Likert scale for "I learn best outside of class through personal study."
LengthSession	The average length of video game session played during semester in hours.
Lonely	Likert scale for "I would consider playing video games if I felt lonely."
MathConf	Likert scale for "I have confidence in my math ability."
MathSkills	Likert scale for "I believe I have good math skills."
NoBusiness	Indicator variable = 1 if neither to "Are you a Pre-business Major, Business Minor, or neither?" and 0 otherwise.
OthersWatchPlay	Likert scale for "I play video games with others watching me play or playing with me."
OutDiffSit	Likert scale for "When I am in a difficult situation, I can usually find my way out of it."
PaidJobHours	"How many hours each week have you spent at a paid job this semester?"
PercentReadings	"What percentage of the assigned readings do you generally have completed before attending this class?"
PlayVid	Indicator variable = 1 if yes to "Do you play video games (can be on phone, laptop, console, etc.)?" and 0 otherwise.
PreBusMajor	Indicator variable = 1 if Pre-business Major to "Are you a Pre-business Major, Business Minor, or neither?" and 0 otherwise.
SatAccPerf	Likert scale for "I feel satisfied with my academic performance."
SatAcEffort	Likert scale for "I feel satisfied with my academic efforts."
SmallClassBetter	Likert scale for "Class size affects my overall performance -- the smaller the class the better.."
SmInClass	Indicator variable = 1 if yes to "Do you use social media during class?" and 0 othewise.
StartSemester	"Which semester did you begin studying at [this university]?"
SubjectMatterSkill	Likert scale for "How well do you rate your skills in this class' subject matter?"
TimeSleep	"What time do you typically go to sleep at night?"
TransferStudent	Indicator variable =1 if if yes to "Did you transfer to [this university] from another university? and 0 otherwise.
Traumatic	Indicator variable = 1 if yes to "Did you happen to experience a traumatic life event right before or during this semester (for example, death of a loved one, your own divorce or divorce of your parents, serious illness of self or immediate family member)?"
Tutors	"How often do you use tutors (non-TAs) for this class?"
UnderstandCourse	Likert scale for "I feel like I understand my course material."

Table 2: Descriptive Statistics for Variables with Significance

Variable	N	Mean	Median	Std Dev	Min	Max
Grade	429	90.30	92.97	8.15	39.79	100.34
PlayVid	529	0.67	1	0.47	0	1
LengthSession	349	1.75	2	1.06	0.5	6
Lonely	347	4.98	5	1.71	1	7
Depressed	348	4.56	5	1.89	1	7
OthersWatchPlay	348	5.10	6	1.72	1	7
SmInClass	418	4.59	6	2.23	1	7
SatAcEffort	520	5.58	6	1.26	1	7
SatAccPerf	517	5.60	6	1.10	1	7
UnderstandCourse	519	5.57	6	1.33	1	7
LearnOutClass	519	5.45	6	1.60	1	7
ACT	475	28.64	29	3.52	16	36
HSGPA	509	3.80	3.90	0.29	0.8	4
MathConf	517	5.50	6	1.38	1	7
MathSkills	515	5.48	6	1.37	1	7
CourseAcadGoals	517	6.19	6	0.99	1	7
CourseBusCareer	516	6.21	7	1.14	1	7
CourseLearnNew	517	5.87	6	1.08	1	7
EmotionalFam	516	5.94	6	1.23	1	7
HandleMany	516	5.58	6	1.25	1	7
OutDiffSit	516	5.95	6	0.92	1	7
LargeVsSmallClass	517	5.18	6	1.60	1	7
SmallClassBetter	517	3.99	4	1.73	1	7
TimeSleep	516	5.34	5	1.06	2	7
PaidJobHours	515	3.09	4	1.95	0	8
AcadScholEver	516	0.52	1	0.50	0	1
TransferStudent	516	0.24	0	0.43	0	1
StartSemester	121	11.94	11	4.83	1	20
COLGPA	500	3.62	3.70	0.32	2	4
NoBusiness	529	0.27	0	0.44	0	1
PreBusMajor	529	0.64	1	0.48	0	1
BusMinor	529	0.07	0	0.26	0	1
CloseWorker	514	0.40	0	0.49	0	1
PercentReadings	418	62.69	70	32.99	0	100
Tutors	511	0.86	1	1.18	0	6
Interest	513	5.44	6	1.28	1	7
SubjectMatterSkill	513	5.51	6	1.10	1	7
Traumatic	512	0.16	0	0.36	0	1

Table 3: Definitions of Video Game and Social Media Variables

Video Game or Social Media Var	Sample	Mean	Std Dev	Min	Max
PLAYVID_AGESTART	340	7.58	3.30	1	19
PLAYVID_PARENTREG	345	0.80	0.40	0	1
PLAYVID_AVGTIMEPLAY	338	5.59	5.14	0.5	35
PLAYVID_LENGTHSESSION	349	1.75	1.06	0.5	6
PLAYVID_BORED	348	5.76	1.35	1	7
PLAYVID_LONELY	347	4.98	1.71	1	7
PLAYVID_DEPRESSED	348	4.56	1.89	1	7
PLAYVID_STRESS	348	5.27	1.68	1	7
PLAYVID_HAPPIER	346	4.48	1.42	1	7
PLAYVID_ALONE	347	4.88	1.73	1	7
PLAYVID_OTHERSWATCHPLAY	348	5.10	1.72	1	7
PLAYVID_DISTRACTS	347	5.08	1.54	1	7
PLAYVID_DIFFICULTSTOP	348	3.72	1.73	1	7
PLAYVID_GAMEOVERTV	347	3.90	1.81	1	7
PLAYVID_BOREDPLAYING	348	4.26	1.45	1	7
PLAYVID_BOREDTV	347	4.31	1.47	1	7
PLAYVID_PLAYINTERFEREHW	347	4.47	1.73	1	7
PLAYVID_TVINTERFEREHW	348	4.80	1.55	1	7
PLAYVID_PLAYWITHOTHERS	348	5.53	1.66	1	7
SOCIALMEDIA_SMTIME	474	1.37	1.36	0	7
SOCIALMEDIA_SMINCLASS	499	3.63	2.71	0	7

Table 4: Video Game and Social Media Descriptive Statistics

Video Game or Social Media Variable	Sample	Mean	Std Dev	Min	Max
PLAYVID_AGESTART	340	7.58	3.30	1	19
PLAYVID_PARENTREG	345	0.80	0.40	0	1
PLAYVID_AVGTIMEPLAY	338	5.59	5.14	0.5	35
PLAYVID_LENGTHSESSION	349	1.75	1.06	0.5	6
PLAYVID_BORED	348	5.76	1.35	1	7
PLAYVID_LONELY	347	4.98	1.71	1	7
PLAYVID_DEPRESSED	348	4.56	1.89	1	7
PLAYVID_STRESS	348	5.27	1.68	1	7
PLAYVID_HAPPIER	346	4.48	1.42	1	7
PLAYVID_ALONE	347	4.88	1.73	1	7
PLAYVID_OTHERSWATCHPLAY	348	5.10	1.72	1	7
PLAYVID_DISTRACTS	347	5.08	1.54	1	7
PLAYVID_DIFFICULTSTOP	348	3.72	1.73	1	7
PLAYVID_GAMEOVERTV	347	3.90	1.81	1	7
PLAYVID_BOREDPLAYING	348	4.26	1.45	1	7
PLAYVID_BOREDTV	347	4.31	1.47	1	7
PLAYVID_PLAYINTERFEREHW	347	4.47	1.73	1	7
PLAYVID_TVINTERFEREHW	348	4.80	1.55	1	7
PLAYVID_PLAYWITHOTHERS	348	5.53	1.66	1	7
SOCIALMEDIA_SMTIME	474	1.37	1.36	0	7
SOCIALMEDIA_SMINCLASS	499	3.63	2.71	0	7

Table 5: Spearman Correlations with Course Grade

The first number in each column is the correlation coefficient, the second number is the p-value, and the third number is the sample size.

POSITIVE CORRELATION		POSITIVE CORRELATION		NEGATIVE CORRELATION	
	Grade		**Grade**		**Grade**
PlayVid	0.04162	**CourseBusCareer**	0.15219	**LengthSession**	-0.12394
	0.3898		0.0018		0.0386
	429		419		279
SmlnClass	0.17429	**CourseLearnNew**	0.12054	**Lonely**	-0.13606
	0.0012		0.0134		0.0235
	344		420		277
SatAcEffort	0.26639	**EmotionalFam**	0.1121	**Depressed**	-0.11731
	<.0001		0.0217		0.0507
	423		419		278
SatAccPerf	0.32158	**HandleMany**	0.16641	**OthersWatchPlay**	-0.14361
	<.0001		0.0006		0.0166
	421		419		278
UnderstandCourse	0.10888	**OutDiffSit**	0.0847	**SmallClassBetter**	-0.14191
	0.0251		0.0833		0.0036
	423		419		420
LearnOutClass	0.1183	**LargeVsSmallClass**	0.17803	**TimeSleep**	-0.10605
	0.015		0.0002		0.03
	422		420		419
ACT	0.21292	**AcadScholEver**	0.25973	**PaidJobHours**	-0.11156
	<.0001		<.0001		0.0224
	388		419		419
HSGPA	0.20641	**StartSemester**	0.27468	**TransferStudent**	-0.12379
	<.0001		0.0074		0.0112
	414		94		419
MathConf	0.27454	**COLGPA**	0.44358	**Tutors**	-0.08983
	<.0001		<.0001		0.0672
	420		407		416
MathSkills	0.25547	**CloseWorker**	0.14912	**Traumatic**	-0.11988
	<.0001		0.0023		0.0144
	419		417		416
CourseAcadGoals	0.27692	**PercentReadings**	0.09015	**NoBusiness**	-0.17494
	<.0001		0.098		0.0003
	420		338		429
SubjectMatterSkill	0.47747	**Interest**	0.27267		
	<.0001		<.0001		
	417		417		
Prebusmajor	0.19763				
	<.0001				
	429				

Table 6: OLS Regression with Grade as Dependent Variable for Entire Sample

Number of Observations Read	529
Number of Observations Used	403
Number of Observations with Missing Values	126

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	8	8226.87782	1028.35973	21.24	<.0001
Error	394	19073	48.40873		
Corrected Total	402	27300			

Root MSE	6.95764	R-Square	0.3014
Dependent Mean	90.32628	Adj R-Sq	0.2872
Coeff Var	7.70278		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Heteroscedasticity Consistent Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	40.34236	4.93139	8.18	<.0001	6.83280	5.90	<.0001	0
PlayVid	1	-0.37213	0.76709	-0.49	0.6279	0.78994	-0.47	0.6378	1.10303
COLGPA	**1**	**7.68488**	**1.31787**	**5.83**	**<.0001**	**1.85046**	**4.15**	**<.0001**	**1.39736**
SubjectMatterSkill	**1**	**2.80742**	**0.42026**	**6.68**	**<.0001**	**0.42541**	**6.60**	**<.0001**	**1.77133**
SatAccPerf	1	0.08854	0.40322	0.22	0.8263	0.45087	0.20	0.8444	1.41788
CourseAcadGoals	**1**	**1.09243**	**0.39975**	**2.73**	**0.0066**	**0.47264**	**2.31**	**0.0213**	**1.26894**
MathConf	1	-0.23293	0.29466	-0.79	0.4297	0.35350	-0.66	0.5103	1.32706
Interest	1	0.15969	0.32599	0.49	0.6245	0.31775	0.50	0.6156	1.44462
AcadScholEver	1	-0.19481	0.80186	-0.24	0.8082	0.84795	-0.23	0.8184	1.32000

Table 7: OLS Model with Grade as Dependent Variable for Gaming Sample

Number of Observations Read	529
Number of Observations Used	277
Number of Observations with Missing Values	252

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	457.68251	114.42063	1.90	0.1108
Error	272	16386	60.24349		
Corrected Total	276	16844			

Root MSE	7.76167	R-Square	0.0272
Dependent Mean	90.63520	Adj R-Sq	0.0129
Coeff Var	8.56364		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Heteroscedasticity Consistent			Variance Inflation
						Standard Error	t Value	Pr > |t|	
Intercept	1	95.78841	1.97181	48.58	<.0001	1.58880	60.29	<.0001	0
LengthSession	1	-0.51855	0.46811	-1.11	0.2689	0.44555	-1.16	0.2455	1.04097
Lonely	1	-0.24376	0.43064	-0.57	0.5718	0.39938	-0.61	0.5421	2.44057
Depressed	1	-0.11751	0.39438	-0.30	0.7660	0.38106	-0.31	0.7580	2.43698
OthersWatchPlay	1	-0.49016	0.27091	-1.81	0.0715	0.27133	-1.81	0.0719	1.01601

Table 8: OLS Model with Grade as Dependent Variable for Gaming Sample

Number of Observations Read	529
Number of Observations Used	266
Number of Observations with Missing Values	263

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	4649.43731	664.20533	14.50	<.0001
Error	258	11821	45.81765		
Corrected Total	265	16470			

Root MSE	6.76887	R-Square	0.2823
Dependent Mean	90.58477	Adj R-Sq	0.2628
Coeff Var	7.47242		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Heteroscedasticity Consistent			Variance Inflation
						Standard Error	t Value	Pr > |t|	
Intercept	1	49.46037	5.95972	8.30	<.0001	9.24101	5.35	<.0001	0
LengthSession	1	-0.30413	0.44142	-0.69	0.4915	0.40183	-0.76	0.4498	1.11519
Lonely	1	-0.21858	0.38471	-0.57	0.5704	0.36231	-0.60	0.5468	2.43238
Depressed	1	0.01575	0.35293	0.04	0.9644	0.34250	0.05	0.9634	2.44426
OthersWatchPlay	1	-0.26073	0.24305	-1.07	0.2844	0.25411	-1.03	0.3058	1.02924
COLGPA	**1**	**6.32711**	**1.39728**	**4.53**	**<.0001**	**2.31288**	**2.74**	**0.0067**	**1.14115**
SubjectMatterSkill	**1**	**2.95642**	**0.42773**	**6.91**	**<.0001**	**0.44557**	**6.64**	**<.0001**	**1.07454**
CourseAcadGoals	1	0.67404	0.45614	1.48	0.1407	0.50084	1.35	0.1795	1.12937

How The Coronavirus (COVID-19) Pandemic Impacted Higher Education Faculty Research Activities

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ABSTRACT

The COVID-19 epidemic has severely harmed the worldwide higher education business, resulting in an enormous health and socioeconomic tragedy that will be remembered for a long time. The COVID-19 pandemic has underlined the need for improved international and global perspectives to assess the numerous COVID-19 ramifications in the short, medium, and long term. Several higher education organizations and associations, including student groups and other higher education organizations, conducted surveys with a specific focus on a topic or problem that developed. This article investigates the pandemic's initial consequences on education and research activities. We want to look at how coronaviruses impact academic research in higher education. We employed a geographically distributed responder survey from Albanian private and public higher education institutions.

Keywords: higher education, challenges, learning, pandemic, research

INTRODUCTION

COVID-19 impacts have outweighed mortality in complex and highly populated nations worldwide. With this in mind, governments throughout the world were establishing alternative work opportunities and package assistance to assure their economic survival. We have seen huge business and organization closures all around the world. This decreased demand and halted manufacturing. The policies that were put in place had an immediate influence on higher education. Because of the rapid proliferation of COVID-19 in Albania, universities were obliged to transition to a 100 percent online format amid the Spring 2020 semester — an unprecedented action in the history of academia. This shift was difficult for everyone. The faculties at Albanian universities spent many days becoming acquainted with the technologies necessary for the virtual classroom. It was also difficult for students, as the majority of them had never attended online classes before. However, the months following March in the Spring 2020 semester were challenging for everyone. Several of the students lost their part-time employment as a result of the closure of small enterprises, and many of them abandoned their leased homes to return to their home cities. The faculty workplace and their personal lives were impacted too.

The pandemic has had a significant impact on the conditions under which higher education must now conduct research and what is now known as "emergency online education"; students require assistance; staff faces unprecedented challenges, including job insecurity; and university leaders must reinvent how to run their campus operations. The consequences will be felt for a long time. To imagine medium- and long-term possibilities, one must first grasp what is happening now and what the implications are and will be for national and international students, part-time, contract-based, or tenured professors, and all other people.

The purpose of this paper's research is to determine how the pandemic influenced people's work and performance, particularly in research. We'd like to focus on how the epidemic affected faculties as well as how it affected the workplace. Although a few research studies were focusing on the global balance of work and family during the pandemic, how everything changed, and how academics regarded the activities of their institutions, there is a paucity of study on this topic in Albania. This is a unique and innovative viewpoint.

LITERATURE REVIEW

Because of the COVID-19 epidemic, educators all around the world were compelled to quickly shift their courses from conventional face-to-face education to nontraditional online delivery (Daniel 2020). Few studies have been conducted yet to investigate the impact of the COVID-19 interruption on higher education. The majority of the research was carried out using empirical analysis. Tartavulea et al. (2020) conducted a pandemic survey of 114

professors and 248 students in 13 European nations. Their findings indicated a shift toward primarily passive distribution with fewer possibilities for participation. Furthermore, both professors and students agreed that online training was less successful than face-to-face instruction. According to Houlden and Veletsianos, the current Covid-19 epidemic has increased the tensions and burdens encountered by university academics and staff who were already trying to combine teaching, research, and service commitments, not to mention the work-life balance (2020).

As a result of the shift, students were obliged to vacate their residences, while instructors were required to vacate their offices, labs, and libraries and work from home. Williamson et al., 2020) stated that as schools close due to the COVID-19 outbreak and many teachers turn to digital means to connect with their students, education policymakers are realizing that the rhetoric surrounding young people is incorrect, and some young people are now excluded from much of their education and social networks. In several nations, particularly in developing countries, the majority of students struggled to obtain devices and a secure dependable internet connection, frequently having to share devices and bandwidth with others, including family members shifting to working from home.

A worldwide pandemic is something that no student today has encountered, and the burden of learning combined with the stress of the situation can create a feedback loop that makes learning more difficult and unpleasant (Livana, Mubin, & Basthomi, 2020). The shift was difficult for faculty as well. The vast majority lacked prior experience and were unfamiliar with technical applications. Others with online teaching experience and competence were occasionally called on to assist those with little while transitioning their classes online in a short amount of time (Rapanta et al., 2020). The complexity of the instructional situation, as well as flaws in planning and organization, are among the primary issues highlighted by university professors concerning web-based courses (Ching 2018). The transition to remote learning has also been viewed as a chance for instructors and students to become more innovative (UNESCO, 2020b). Teachers' worries about options for remote/online learning were connected to their degree of knowledge and abilities in the use of technology, access to technology, and solitude at home according to UNESCO 2020a.) There are schools in Albania that have limited access to information and communication technology (ICT), and technology has not been appropriately and adequately incorporated into the curriculum, nor is online learning employed as it is in other countries. According to Duraku and Hoxha, 2020, teachers' attitudes about technology and online learning are influenced by a lack of knowledge and abilities for integrating technology into teaching.

METHODOLOGY

This study examines how the performance of the faculty specifically the research was impacted by the COVID-19 transition to online instruction. This study employed a hybrid quantitative and qualitative research approach design. This study explores the influence of Covid on academic staff research using quantitative data and augments it with qualitative analysis. You completed your research in two stages. The first step included the administration of standardized measures and questionnaires. A focus group discussion was held in the second phase to assess the findings of the data acquired in the previous stage.

Potential volunteers were contacted through email and given information about the study's goal as well as the time it would take to complete the questionnaire. They were also promised that their data and information would be kept private, that their participation was entirely optional, and that they may opt-out at any moment. The questionnaire was distributed via Google Forms, together with all relevant information and an invitation to participate.

PARTICIPANTS

The survey respondents consisted of Albanian faculty members meeting specific requirements and having various characteristics. We invited 130 but data were obtained from 100 respondents in total. (see Table 1 for the characteristics of survey participants and the distribution of these characteristics amongst the respondents, respectively). We collected answers from respondents in 2021. We analyzed the data collected using SPSS software.

DISCUSSION

Table 1 below shows data regarding different characteristics among the respondents.

Variables	Requirements/Sample Frame	Frequencies	
Age	25 years of age or older	25-34	27
		35-44	46
		45-54	17
		55-65	10
Gender	Male and female	Male	44
		Female	56
Affiliation	Public and private institutions	Public	68
		Private	32
Education Level	College graduate, Master's, Ph.D., and post-doctoral studies	College Graduate	6
		Master	32
		PhD	58
		Post-Doctoral studies	4
Employment status	Full and part-time	Full time	78
		Part-time	22
Employment number or years	1 year and more	1-5	27
		5-10	23
		10-20	44
		20+	6
Title	Academic title	Assistant lecturer	4
		Lecturer	45
		Associate professor	34
		Professor	17

We addressed the following questions regarding the pandemic's impact on research activities and concerns about the future. Respondents could choose more than one answer.

Research Questions:
1. From the beginning of the pandemic until now you have heard colleagues or had direct experience regarding the impact of the pandemic on scientific journals and conferences.
2. Have you had personal experiences or heard about the impact that the pandemic has had on other institutions related to research projects, research funds, libraries, and professional societies?
3. In what forms has the pandemic directly affected your research work?
4. Will the pandemic have research-related impacts on your institution in the future and if so, what impact do you think the pandemic will have on your professional research area?
5. Do you have any particular concerns you want to share?

Question 1. The impact of the pandemic on scientific journals and conferences.

Data from chart 1 shows that the majority, 60% of the faculties reported that they had a personal experience or heard other colleagues had experienced postponement and delays in international conferences and these conferences were shifted from in-person to online. 59% reported a change in scientific conference placement from in-person to online. Delays were noticed also in the acceptance timeline and publishing in international journals. 16% experienced a reduction in their faculty development fund.

Chart 1

Category	Percentage
Other	6%
Limitations and reductions of faculty development funds available for research, publications, fee payments, conference travel etc.	16%
Delays regarding the acceptance and publishing previously accepted scientific articles from journals	24%
Scientific conferences planned to take place with in person participation took place online	59%
Postponement of dates and delays in the organization of scientific conferences	60%

Question 2. Have you had personal experiences or heard about the impact that the pandemic has had on other institutions related to research projects, research funds, libraries, professional societies, etc?

From chart 2, we can see there were funding restrictions for 39% of faculty members and 38% faced changes from their institutions related to the organization of the planned conferences. Some of the other answers included the inability to access materials due to travel restrictions and archives, libraries, and museums have remained closed and this has prevented them from scientific research. For only 18% of them, there was no negative impact.

Chart 2

Category	Percentage
There has been no negative impact in the area where I operate	18%
The professional associations of which I am a member have not carried out all the planned activities	12%
Archives, libraries, museums have remained closed and this has prevented me from scientific research	13%
The inability to access research materials has resulted in delays or cancellations of planned researches and projects	28%
My institution changed the projects related to the organization of the planned conferences	38%
Funding restrictions	39%

Question 3. In what forms has the pandemic directly affected your research work?

Chart 3

Category	Percentage
Cancellations of research grants by research institutions	3%
It had the greatest impact on the cancellation of international conferences where we could not go physically but were…	4%
Health issues (physical or mental) negatively affected my research work	41%
Restrictions on movement affected participation in conferences and research archives, hindering and negatively affecting…	52%
Increasing family responsibilities such as caring for young children or other family members negatively affected my time and ability…	62%

Chart 3 shows how the faculty members' research work was affected by the pandemic. 62% had an increase in family responsibilities such as caring for young children or other family members and this reason negatively affected their time and ability to complete scientific work within the planned time frame. Restrictions on travel reduced participation in international conferences which had a negative impact on research for 52% of the respondents. For 41% that were affected with health issues, the impact was negative.

Question 4. Will the pandemic have research-related impacts on your institution in the future and if so, what impact do you think the pandemic will have on your professional research area?

75% of the faculty reported that they experienced an increase in the time needed to prepare for online teaching and they were worried that the pandemic will increase their teaching load. 45% were worried about the negative impact on their family situation due to an increase in family responsibilities, such as caring for school-age children and other family member. More than half of them were concerned about the negative impact that the pandemic will have on the work-life balance and 38% had difficulties with adapting to new technology and online learning preparation. Among other concerns was the inability to meet criteria for promotion and fund reductions from their institutions. But there was also some positive feedback. For 28% of the faculty, the pandemic has had a positive impact as with the development of online conferences it was easier and less costly to participate. Some institutions don't cover all international conference participation expenses so for them, online conferences were viewed as a better and cheaper opportunity.

Chart 4

Category	Percentage
Fear of future cuts to the faculty development fund	8%
The development of online conferences has had a positive impact and…	23%
Inability to achieve the criteria and capture the phases for promotion on…	24%
Difficulties with learning and adapting to new technology as a result of…	28%
Negative impact on work-life balance	38%
Negative influence on my family status since I have more family duties,…	45%
Increase the amount of time allocated to teaching preparation because…	75%

Question 5. Do you have any particular concerns you want to share?
The last question was an open question. Some of the faculty expresses how the pandemic affected faculties unequally. People with children are experiencing more interruption than someone without. Faculty with less experience were impacted more than experienced faculty. The amount of preparation for online teaching is overwhelming and the resources and training that institutions provided were limited. Due to the Covid budget crisis, there were several changes to faculty research and teaching support, including the cancelation of Professional Development Grants, and the limiting of Faculty Development funds. All these fund reductions will hurt the research. The pandemic created a new mentality in our country and this experience will open new horizons of opportunities for accreditation of institutions that will offer online teaching. In the future higher level educational institutions need to provide flexible delivery methods, digital platforms, and modernized curricula.

CONCLUSIONS

The COVID-19 epidemic had an immediate impact on academic workloads and working conditions. Most faculty members have had to put in many additional hours to mentor and advise students in need, modify university programs and handle COVID-19 hazards, and assist communities in dealing with contemporary circumstances. At the same time, many faculty members' productivity and research activities were suffering as a result of a lack of access to labs and equipment, research locations, and research subjects, as well as canceled conferences and the inability to travel to do research and meet with partners. The young faculty and especially women and mothers of young children faced more interruption due to the pandemic. Their work-life balance was affected due to more family responsibilities.

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Python Web Scraping:
An Experiential Learning Assignment to Teach Business Analytics

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ABSTRACT

This study describes an experiential learning assignment that promotes web scraping using Python. Web scraping is the process of extracting data from the web to create structured data for analytics purposes. This assignment focuses on the data discovery phase of business analytics, where students must experience the iterative process of business and data understanding. During the assignment, students must find data feasible for extraction while considering its value. The assignment is appropriate for students with a limited programming background. The assignment can be offered in a business analytics course or infused into existing business courses.

Keywords: experiential learning, analytics, business, Python, web scraping, data collection

INTRODUCTION

There has been significant growth in the demand for business graduates with a background in data analytics. Many business schools offer data analytics courses or integrate analytics into existing courses, and they use Python programming to perform the analysis (Dzuranin, Jones, & Olvera, 2018; Frydenberg & Xu, 2019). Python has become a widely used language for business, marketing, and finance analytics (Xu & Frydenberg, 2021), and therefore, learning Python is essential for business students.

The business analytics process consists of multiple phases, and the first phase is data discovery (Phillips-Wren, Iyer, Kulkarni, & Ariyachandra, 2015). Data discovery aims to find, understand and collect data that can answer business questions. Data discovery is a crucial phase in analytics because it requires business and data understanding that translates into problem definition and project plan (Phillips-Wren, Iyer, Kulkarni, & Ariyachandra, 2015). While previous teaching notes focus on data preparation or modeling in their instructions (Brau, Brau, & Keith, 2020; Li, 2022), this study focuses on the data discovery phase.

This study describes an assignment that demonstrates simple web scraping using Python. In this assignment, students will find data of their interest on Wikipedia, scrape, and load them into Jupyter Notebooks. Then, students must form questions, perform analysis and find the answer. The objective of this study is threefold: (1) to introduce web scraping as one of the ways to collect data during the data discovery phase, (2) to introduce Python and its analytics libraries to business students, and (3) to experience learning data discovery as an integral part of business analytics. This study provides an experiential learning assignment to increase students' interest and engagement in learning Python and business analytics. Furthermore, this assignment allows students to use Python to perform basic analytics without acquiring advanced coding skills. The next sections discuss a brief literature review, followed by implementation, evaluation, and conclusion.

LITERATURE REVIEW

Business analytics is the scientific process of converting data into insights for improved decision-making (Wilder & Ozgur, 2015). Several process models such as CRISP-DM (CRoss-Industry Standard Process for Data Mining) (Wirth & Hipp, 2000), SEMMA (Sample, Explore, Modify, Model, and Asses) (SAS, 2005), and KDD (Knowledge Discovery in Databases) (Fayyad, Piatetsky-Shapiro, & Smyth, 1996), were developed to guide analytics processes. These process models share similarities; they consist of iterative phases of data discovery, data preparation, information modeling, and evaluation (Dittert, Härting, Reichstein, & Bayer, 2017).

Data discovery, for our purposes, is the phase of finding, understanding, and collecting data to answer business questions (Martínez-Plumed, et al., 2019). In the past, analysts mainly took a relatively passive stance and utilized internal data that were readily available (Muller, et al., 2019). However, businesses nowadays require analysts to be more proactive in finding external data to make better decisions. Analysts must define the objectives and business questions in the data discovery phase. This phase is essential because it determines the analytics plan and strategy.

Business and data understandings are two prerequisites for defining objectives and business questions. Business understanding requires understanding the business and its problems so that analytics findings have value. In contrast, data understanding involves discovering new and valuable data sources and familiarizing them (Wirth & Hipp, 2000). The two prerequisites are closely related and dependent on one another. Good business questions rely on data availability, while insights from data need to apply to business.

Once objectives and business questions are confirmed, analysts can proceed with data collection. Two data sources for business analytics are internal and external. Examples of internal data are relational databases that businesses create for online analytical processes. In contrast, external data can be open data (i.e., web or government data) or for-sale data from data brokers and cloud applications (Geerts, 2017). While internal data can be directly obtained from a business' database, external data sometimes requires novel extraction methods.

The web is an excellent place to find real and relevant business data such as consumer products, services (i.e., hotels, restaurants), or sports. Web-data extraction can be done manually by either entering or copy-pasting data. In contrast, web scraping provides a timely, automated data extraction with minimum errors. Web scraping refers to the process of extracting unstructured data from the web to build structured data for analytics purposes (Dogucu & Çetinkaya-Runde, 2021). There are two types of web scraping: screen scraping and API. While application programming interfaces (APIs) use software to connect a user with a server that stores data, screen scraping extracts data from the website's source code. APIs provide a quick and straightforward data extraction. However, APIs are costly and do not always expose the complete data.

This study will demonstrate the screen scraping approach but will refer to it as web scraping to maintain consistency. Teaching web scraping to business students has some merits. The world wide web hosts essential data for business. For example, reviews on Amazon or TripAdvisor are the potential data source for businesses to assess customer satisfaction (Han & Anderson, 2021). Product price and customer satisfaction are dynamic phenomena requiring continuous attention and immediate action. Since conducting sequential surveys are costly and time-consuming, web scraping is a valuable skill in the workforce. Employers offer a salary range of up to $128,000 for candidates with web scraping skills (Dogucu & Çetinkaya-Runde, 2021). However, time and programming skills are among web scraping limitations. Analysts must possess programming skills such as Python, HTML, and CSS to extract data from web pages. Furthermore, because data are not static and each web page is unique, web scraping codes are not reproducible, and analysts must spend some time analyzing the web document. Due to the complexity of mastering the programming skills, instructors are advised to start with elementary topics and tools and use a practical approach to introduce web scraping to beginners, such as business students (Dogucu & Çetinkaya-Runde, 2021; Frydenberg & Xu, 2019).

These experiential learning assignments are classroom-based hands-on laboratory activities (McCarthy & McCarthy, 2006). Literature suggests that individuals avoid tasks and assignments that they perceive to be beyond their ability (Bandura, 1986). However, they will engage in tasks and pursue skills development when self-efficacy is high. Students enjoy hands-on assignments that are engaging and relevant to their interests (McCarthy & McCarthy, 2006; Harnowo, 2021). Experiential learning allows students to get familiar with complicated processes and apply concepts and procedures to practice. When combined with topics and tools suitable for the target, experiential learning assignments can be teaching tools that promote self-efficacy.

PROPOSED ASSIGNMENT

Pre-assignment requirements
Required skills
Although HTML and CSS skills are not needed for this assignment, students must have basic Python knowledge and its business analytics libraries, such as Pandas for data manipulation and Matplotlib for data visualization. Data from Wikipedia is not clean, and students must prepare data before analyses. Instructors who wish to infuse this assignment into the current course can assign the students to briefly learn Python from a short MOOC course (Harnowo, 2022).

Required Materials

We suggest using Jupyter Notebooks to complete the assignment. Jupyter Notebooks is a free, open-source project that enables authors to enter, edit, execute, debug, and modify codes in a web browser. It is a suitable learning environment for business students with limited programming knowledge. Students can install Anaconda distribution (https://www.anaconda.com/products/distribution), including Jupyter Notebooks and most business analytics libraries. As our goal is to introduce web scraping, we focus on `requests` and Pandas libraries to scrape data from a Wikipedia page. There are other Python tools specialized in web scrapings, such as BeautifulSoup, Selenium, WebDriver, and XPath, but they are out of the scope of this study.

Data Discovery

Business and Data Understanding

In this assignment, students must find data of their interest on Wikipedia. Such an approach will help them with business and data understanding in the data discovery phase. Instructors can direct students to search for popular topics such as movies, music, games, or sports. For example, students can search for a list of the highest-grossing video games or movies. Once the page is found, students must ensure that the Wikipedia page has a table that contains valuable data. Students must think of analytics questions that can be answered using the data. As this is an iterative phase, students must continuously check data availability with the analytics questions.

Data collection
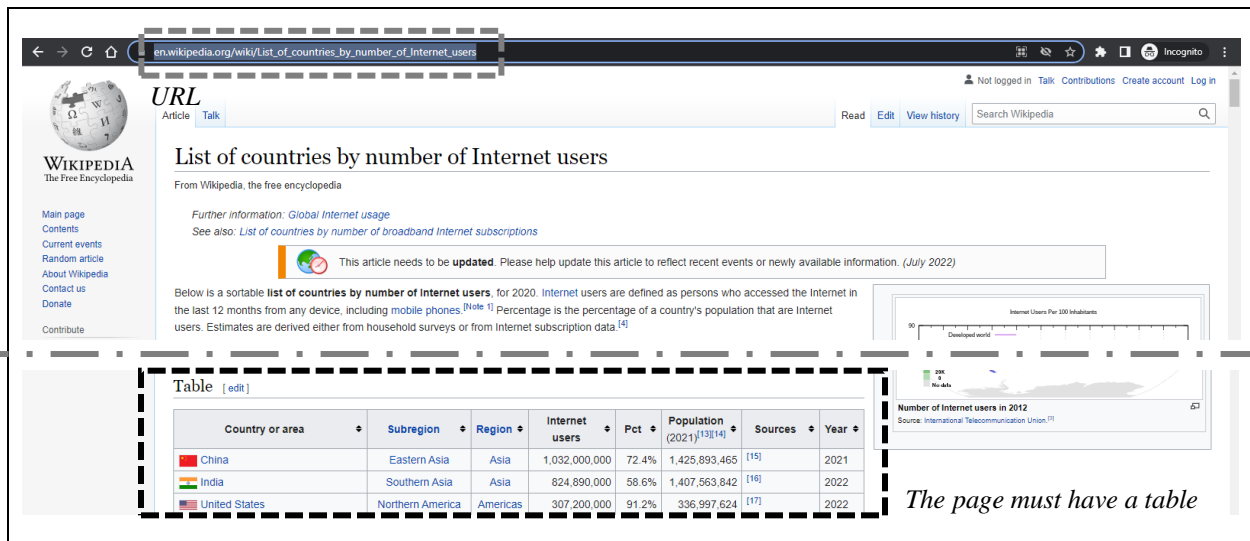
Before asking students to perform web scraping, instructors might want to run a demo to show the steps. Figure 1 shows a Wikipedia page that lists countries by the number of internet users. Suppose a multinational internet provider wants to expand to a new region or country. Examples of analytics questions are as follow:

- What is the average percentage of internet users across regions?
  - Which region has the lowest percentage of internet users?
  - Which countries should the company invest in the region? Show justifications by filtering the data by the percentage of internet users and the population of over five million.

The page can be retrieved through the following URL:

https://en.wikipedia.org/wiki/List_of_countries_by_number_of_Internet_users

Figure 1: Wikipedia Page

Once data, analytics questions, and web page URLs are confirmed, students can proceed with the web scraping process. The two tools required are `requests` and Pandas libraries. `requests` is a library to download a web page's content, while Pandas is a library for data manipulation and collection. Pandas has a function called `read_html()` to extract tables by searching for `<table>` elements in the HTML code of a web page. The function will return a list of Pandas `DataFrame`.

Figure 2: Python Code for Web Scraping

```python
import pandas as pd
import requests
#download the wikipedia page's content
URL="https://en.wikipedia.org/wiki/List_of_countries_by_number_of_Internet_users"
response= requests.get(URL)
text= response.text #gives back the page's HTML
list=pd.read_html(text) #list of tables found on the Wikipedia page
df=list[5] #access the fifth table on the web page
df.head() #show the first five rows in the column
```

Out[1]:

	Country or area	Subregion	Region	Internet users	Pct	Population.mw-parser-output .nobold{font-weight:normal}(2021)[13][14]	Sources	Year
0	China	Eastern Asia	Asia	1032000000	NaN	1425893465	[15]	2021
1	India	Southern Asia	Asia	824890000	NaN	1407563842	[16]	2022
2	United States	Northern America	Americas	307200000	NaN	336997624	[17]	2022
3	Indonesia	South-eastern Asia	Asia	196000000	NaN	273753191	[18][19]	2020
4	Brazil	South America	Americas	165300000	NaN	214326223	[20]	2022

Figure 2 shows the code to extract the table from the Wikipedia page. Notice that all data are correctly loaded on Pandas `DataFrame` except for the "NaN" on the "Pct" column. One of the analysts' responsibilities is to validate data. NaN is a marker that Pandas use to denote missing data. Here, Pct is the percentage of internet users relative to the country's population. We can correct the error by replacing the NaNs with computed values from two columns: "Internet users" and "Population." In addition, we need to shorten and rename the population's column name to avoid errors during analysis. Figure 3 shows the code to perform those corrections.

Figure 3: Python Code for Data Validation

```python
df = df.rename(columns={'Population.mw-parser-output .nobold{font-
weight:normal}(2021)[13][14]':'Population'}) #rename column
x=df['Internet users']/df['Population'] #calculate the percentage of internet users
df["Pct"].fillna(x, inplace=True) #replace NaN with calculated values
df.head() #show the first five rows in the column
```

Out[2]:

	Country or area	Subregion	Region	Internet users	Pct	Population	Sources	Year
0	China	Eastern Asia	Asia	1032000000	0.723757	1425893465	[15]	2021
1	India	Southern Asia	Asia	824890000	0.586041	1407563842	[16]	2022
2	United States	Northern America	Americas	307200000	0.911579	336997624	[17]	2022
3	Indonesia	South-eastern Asia	Asia	196000000	0.715973	273753191	[18][19]	2020
4	Brazil	South America	Americas	165300000	0.771254	214326223	[20]	2022

Information modeling and insights
We can perform a simple analysis to answer the analytics questions. Pandas has a "`.groupby`" method to group large data and compute operations. Figure 4 shows the code to perform the tasks. We learned that Africa and Oceania are the regions with the least percentage of internet users.

Figure 5 answers the final question: the country with a five million or above population and the lowest internet users. The preliminary analysis suggests that these five countries: Somalia, Central African Republic, Burundi, Chad, and Liberia as areas to consider when expanding to new markets.

Figure 4: Python Code for Analysis

```python
#calculate the mean of each region
df1=df.groupby('Region')['Pct'].mean()
df
```

```
Out[3]: Region
        Africa      0.257267
        Americas    0.634883
        Asia        0.631840
        Europe      0.827884
        Oceania     0.437330
        Name: Pct, dtype: float64
```

```
#create a bar plot
df1.plot.bar(color =
['black','lightgray','lightgray','lightgray','gray']
, rot=0)
```


Figure 5: Python Code to Filter and Sort

```
df2=df.query("Region=='Africa' and Population>5000000") #filter by region and population
df2=df2[['Country or area', 'Region', 'Internet users', 'Population']] #simplify the DataFrame
df2.sort_values('Pct').head() #sort values ascending
Out[4]:
```

	Country or area	Region	Internet users	Pct	Population
165	Somalia	Africa	294851	0.017278	17065581
172	Central African Republic	Africa	202204	0.037053	5457154
147	Burundi	Africa	607311	0.048387	12551213
137	Chad	Africa	968500	0.056375	17179740
158	Liberia	Africa	377607	0.072709	5193416

Concluding Remarks

Legal and ethical considerations

This section briefly discusses the legal and ethical issues pertaining to web scraping activity in the United States. In general, web scraping in the U.S. is a legal activity. On September 9, 2019, The U.S. Supreme Court allowed web scraping in instances when the information scraped is intended to be publicly accessible. The court defined public information as information that is neither for sale nor concealed behind a password-protected authentication mechanism. In terms of what information is sought from a website, web scraping is legally equivalent to web browsing. However, web scraping becomes illegal when information is accessible only to members and requires a sign-in (Han & Anderson, 2021) or when data concerns personal information or intellectual property. Note that legislation may vary from country to country. Finally, web scraping is a relatively new data collection method; therefore, the law is still evolving.

Legality is not necessarily synonymous with ethics. Web scraping is not a subject of Institutional Review Boards (IRB), but students must perform web scraping cautiously. For example, web scraping that includes requests activities might overwhelm the hosts' server, mainly when computers perform them. While requests performed by humans are usually within a manageable range, automated web scrapers might send excessive requests over a short period. As a result, the server might not function correctly (Han & Anderson, 2021).

EVALUATION

Students completed open-ended pre and post-assignment surveys to assess their knowledge and perception of web scraping. In general, students knew the web scraping definition and its purpose. Almost all of them knew the concept but did not know how to perform it. However, they felt that it is a valuable but challenging skill. One student wrote: *"Yes, I think that it is beneficial to know. I am not very familiar with web scraping but would like to explore the area of agriculture doing it if possible"*. Another student wrote: "*I've never web scraped before. I don't know how to code. I think it would be challenging.*"

Post assignment, students' opinions changed. In addition, they thought web scraping required advanced programming skills. One student wrote: "*I couldn't believe I just scraped data from the internet!*". Another student wrote: "*Web scraping is not as bad as I thought. I would like to explore more data on the web.*" Finally, students were asked to provide their opinion regarding the assignment. Over 90% of them gave positive feedback. One student wrote: *"This assignment motivated me to learn more about Python and data analytics.*" Another student wrote: "*I know that web scraping is much more than this, but this assignment made me confident about my programming skills.*"

CONCLUSION

To summarize, web scraping is one way of collecting data. The web holds an enormous amount of data that offer insights and opportunities to businesses. It is the analysts' task to take the opportunity and use web data. Web data are real and current but dirty and relatively hard to collect. Traditionally, students learned business analytics with toy datasets that are clean and readily available. This study proposes an assignment that resembles an actual business analytics process.

The objectives of the assignment are to introduce web scraping, Python, and data discovery to business students. Business students generally have limited programming experience (Frydenberg & Xu, 2019). The previous study shows negative perceptions and attitudes among factors that hinder learning a programming language (Cheah, 2020). The study also suggests that instilling positive perception through experiential learning during the early stage of learning computer programming is important. Such a teaching strategy will increase students' confidence and ease learning (Cheah, 2020). The students' feedback confirmed the efficacy of the assignment. Students were more confident to learn more and take on more challenging projects.

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Blending a MOOC course into a Business School's Course to Introduce Python for Data Analytics

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ABSTRACT

Many business schools began offering a data analytics course or infusing data analytics topics into their existing courses. Python programming language is an essential skill pertaining to data analytics. Python can process real-time, large, unstructured data as efficiently as traditional data. However, instructors must overcome the most significant hurdle business students often have: a lack of programming background. This paper documents the use of a short MOOC course to introduce students to Python for data analytics. A survey after course completion shows that students were more ready and motivated to learn more about Python language.

Keywords: Data analytics, Python, MOOC, teaching, blended learning

INTRODUCTION

There has been a growing trend of offering data analytics courses in business schools in the past few years (Frydenberg & Xu, 2019; Zhao & Zhao, 2016), and many schools believe that Python programming is an essential tool to be taught in the course (Brau, Brau, & Keith, 2020; Li, 2022). Python is a free, open-source programming language, and it has become a popular data analytics tool due to its simplicity and flexibility (Xu & Frydenberg, 2021). Moreover, Python has an abundance of open-source packages and libraries for data analysis.

However, teaching Python to business students can be challenging because, often, the students have no programming background (Frydenberg & Xu, 2019). To overcome such a challenge, Brau, Brau & Keith (2020) split the course into two parts: basic Python programming and data analytics with Python. Li (2022) requires students to take a Python programming course, although he spent the first weeks reviewing Python data structures and data analytics libraries. Sharp (2019) uses Codecademy interactive lessons to supplement a Python programming course.

A similar challenge exists at Washburn University School of Business. Our students must take foundational data analytics class where they learn basics analytics and Microsoft Excel, Access, and Power BI skills, but not Python or other computer programming language. This paper describes the author's experience blending a data analytics (DA) course with a short and focused course on Cognitiveclass, a MOOC (Massive Open Online Courses) platform. The DA course is called DA 348, entitled "Data Discovery and Management," and is usually taken at the junior level. As the course title implies, Python coding skill is not the course's main objective, but rather, it is a tool to achieve the objectives. Consequently, Python introduction and understanding is a timely issue. Students must be introduced to Python's data analytics capabilities before they can comfortably apply the skills to discover and manage data later in the semester.

This paper complements the approaches used in studies mentioned previously (Brau, Brau, & Keith, 2020; Li, 2022; Sharp, 2019). In contrast to Sharp's (2019) work, this study uses Cognitiveclass, a MOOC platform created by IBM that provides free open online courses on data science skills. Using a short course from Cognitiveclass to introduce Python early on provides ample time to cover more topics in the course. Additionally, the course exposes students to NumPy, Pandas, and Matplotlib libraries, which are relevant to business and help increase students' interest in learning Python programming (Frydenberg & Xu, 2019). Accordingly, our paper applies not only to courses that teach Python and Data Analytics but also to existing business courses such as Accounting, Operations, or Supply Chain Management. Instructors of those courses can replace some chapters with Data Analytics topics that employ Python.

The remainder of the paper proceeds as follows. The literature review briefly discusses business school data analytics and Python courses and how internet resources can help with learning. The implementation section discusses the MOOC course used to introduce Python data analytics. The evaluation section discusses students' feedback on the survey upon completing the course. Finally, the conclusion section summarizes the discussion in the paper.

LITERATURE REVIEW

Data analytics is a field that has been gaining much interest in the last few years (Xu & Frydenberg, 2021). Businesses witness the availability of big data: extensive data in various formats coming in high velocity. Many companies have reported a growing demand for students to acquire data analytics training (Brau, Brau, & Keith, 2020; Zhao & Zhao, 2016). Business students perceive data analytics as a required skill that can open the doors to employment opportunities and future careers (Frydenberg & Xu, 2019). Accordingly, many business schools adjusted their curricula to include data analytics courses to meet the demand (Xu & Frydenberg, 2021; Brau, Brau, & Keith, 2020), while others infuse data analytics topics into their existing courses (Dzuranin, Jones, & Olvera, 2018).

Data analytics involves the extensive and systematic use of data to comprehend phenomena that drive business decisions and actions (Dzuranin, Jones, & Olvera, 2018). Traditionally, business schools teach Microsoft Excel skills to perform data analysis (Wang & Gu, 2016), but Excel has limitations, especially with big data. Python, in contrast, can efficiently process real-time, large, or unstructured data. There has been a trend to offer Python for data analytics in business school courses (Xu & Frydenberg, 2021). Python is also perceived as a more robust language than R, another open-source tool for data analytics (Brau, Brau, & Keith, 2020).

There are many benefits of using Python language for data analytics. Python is an open-source language and free to use. There are free Python editors and IDEs (Integrated Development Environment) to write, test, and debug the code. The Python Package Index website records over 400,000 Python packages available, most of which are free to use. Moreover, Python is a popular coding language (Xu & Frydenberg, 2021), so many resources are available online that students can google and access.

However, two main challenges exist in teaching Python for data analytics in business schools. The first challenge is content selection; there is no common agreement about the breadth of data analytics topics taught in the course. For example, some studies include only data preparation, descriptive analytics, and visualization in their courses (Dzuranin, Jones, & Olvera, 2018; Frydenberg & Xu, 2019), while others add predictive analytics, text analysis, or data mining topics in their courses (Brau, Brau, & Keith, 2020; Li, 2022; Wang & Gu, 2016). The disagreement is expected because some schools offer data analytics as a major while others offer a single class or even infuse topics into existing classes. Therefore, instructors must select topics that they believe are beneficial for their students in their careers (Frydenberg & Xu, 2019). The content disagreement entails an additional issue: textbook selection (Wang & Gu, 2016). Studies report the use of self-created textbooks (Brau, Brau, & Keith, 2020), selected topics from data science textbooks (Frydenberg & Xu, 2019), and a mix of multiple textbooks (Li, 2022) to overcome the issue.

The second challenge is that business students rarely have a Python or computer programming background (Wang & Gu, 2016). Unlike Excel, with its graphical interface, Python requires users to write code to perform tasks. In their study, Frydenberg and Xu (2019) found that coding was quite challenging for students with little to no programming experience. The literature suggests several internal and external solutions. One of the internal solutions is to have teaching assistants (TAs) assist struggling students (Brau, Brau, & Keith, 2020). The other solution is to group students with prior programming knowledge with their less-experienced classmates (Frydenberg & Xu, 2019). Alternatively, schools can design a prerequisite course for the data analytics course (Li, 2022).

Instructors can use external resources to complement the data analytics course, which can be seen as a form of blended learning (Hrastinski, 2019). Studies show that students' interests increase, and they are more motivated to learn Python once they find relevance with their major (Frydenberg & Xu, 2019; Xu & Frydenberg, 2021). In a blended learning system, face-to-face learning experiences are combined with online learning experiences (Garrison & Kanuka, 2004). The blended learning system can benefit from the strengths of face-to-face and online learning. In particular, students can receive direct guidance and assistants from the instructors. Moreover, the learning process can continue outside the classroom. Finally, students can have all learning materials they can review at their convenience (Hrastinski, 2019).

There are abundant online resources for teaching and learning Python (Sharp, 2019). Online videos are the most accessible resources; most of them are free and can be found on YouTube. A quick search using "python course" as a keyword and "videos" as a filter shows over 29 million results. However, finding videos with quality instructions that fit our course will be extremely difficult. Furthermore, blending with our course and keeping track of students' learning progress will be hard unless we create a channel with self-made videos (Ranga, 2017). Khan Academy (www.khanacademy.org) provides a better alternative. Their videos are short, focused, and well-delivered compared to many YouTube videos. However, their Python courses are basics and not made for learning data analytics.

Another form of online learning resource is the massive open online courses (MOOCs). In general, MOOCs are "*open access, global, free courses with video-based instructional content, problems set, and forums released through an online platform to high volume participants*" (Baturay, 2015, p. 427). MOOCs are developed through the partnerships of learning management companies such as Coursera, edX, Udacity, and top universities and organizations (Liyanagunawerdana, Adams, & Williams, 2013). To generate revenues, these companies charge a fee for certifications and unlimited access to materials while keeping their courses free to audit. Additionally, companies and institutions arranged a profit-sharing model, and the institutions have the right to use the course for their courses. The "Python for Data Science" course used in this paper is created by IBM and is offered on edX (https://www.edx.org/) and their platform, Cognitiveclass (https://cognitiveclass.ai/). To review and complete a course, potential students must create an account and enroll. Some courses have fixed start and end dates, while others have more flexible offerings and completion times (Stracke, Downes, Conole, Burgos, & Nascimbeni, 2019).

There are also online classes available on the internet. For example, Kaggle (https://www.kaggle.com/learn/python) and Google (https://developers.google.com/edu/python) offer Python classes for free. There are also interactive lessons such as Codecademy (www.codecademy.com). Sharp (2019) discussed the experience of using Codecademy to supplement a Python course. He noted that advantages include flexibility and immediate feedback on the students' code. However, the solutions are predefined, encouraging students to rush through the lessons and discouraging critical thinking (Sharp, 2019).

To summarize, many online resources are available to introduce Python in business courses. Each option has its advantages and disadvantages. Some important considerations mentioned in the literature are quality, fit, availability, cost, and tracking capabilities. Instructors must do their due diligence to see which options work best.

IMPLEMENTATION

Business Course
This paper describes blending a MOOC course into a business school's course to introduce python data analytics. The business course is DA348, "Data Discovery and Management," a required course for a data analytics major and an elective for other business majors. Prerequisites for DA348 are business statistics, management information systems, and foundation of data analytics, where students learn Microsoft Office skills and statistical tools (SPSS). Since entering students have limited programming backgrounds, the author decided to blend with a short "Python for data science" course in the first weeks of the semester.

After week five, the course covers data discovery and management using Python. Data discovery, the first phase in data analytics, is the phase of learning what data is available, relevant, and affordable to use (Geerts, 2017). Data management, the second phase, focuses on extracting, cleaning, and integrating data. The course utilizes the Anaconda Python distribution; this distribution is free for individual use and easy to install. Anaconda package is available for Windows, macOS, and Linux systems. In addition, libraries necessary for data analytics, such as NumPy, Pandas, Matplotlib, Seaborn, and Scikit-Learn, are installed with the package. Jupyter Notebook, a Python IDE, is also included in the package.

MOOC Course
The author chose Python for the Data Science course from the Cognitiveclass (https://cognitiveclass.ai/courses/python-for-data-science). This course is designed for beginners, and it covers:
- Module 1 - Python Basics: *types, expressions, variables, string operations*
- Module 2 - Python Data Structures: *list, tuples, sets, dictionaries*
- Module 3 - Python Programming Fundamentals: *flow control, conditions, and branching, loops, functions, objects, and classes*
- Module 4 - Working with Data in Python: *read and write files, Pandas*
- Module 5 - Working with NumPy Arrays and Simple APIs

Each module covers multiple topics, and a video is provided to explain each. The videos are easy to follow because they follow some of the guidance used in Khan Academy: an informal style of teaching, small chunks of information, a duration of 6-9 minutes for each video, and signaling principles (Clark & Mayer, 2016). There are labs every 1-3 topics in the module. Unlike the pseudo-python environment used in many online classes, this course utilizes skills network labs (SN Labs), a virtual lab using Jupyter Notebooks. The labs provide students with real programming

experience, as solutions are not predefined. Finally, there will be review questions at the end of each module and a final exam at the end of the course. Note that retaking the final exam is possible in the course.

Students can get a badge and certificate upon completing all modules and exams. Students will also have access to all materials after course completion. The five modules must be completed in the first four weeks of the semester. The author suggests that students complete the first two modules in one week and one module a week for the remainder. During those four weeks, the author reviews data analytics topics from previous courses to ensure students' readiness to learn new topics. The topics covered are command line, data, basic statistics, visualization, interpretation and business analysis, and data mining.

The MOOC course contributes to 10% of the overall course grade. In the fourth week, the author assigns a Python to exercise to assess their knowledge of the lessons covered in modules 1-5. The exercise also transitions between programming in the virtual lab and on their local Jupyter Notebook.

EVALUATION

Students' Feedback
Students were asked to complete open-ended survey questions after finishing the MOOC course. The first question was, "How effective was the course in teaching Python skills?" All students gave a positive response. The common word used across responses was "*understand.*" Students feel they have a better understanding of Python, and they learned a lot. One student stated," *the course was good, and I feel like I learned a lot. I was able to get a better understanding of Python and how it works. I did not understand how Python worked before the course, and now I understand better.*" Another student with a Python background also appreciated the course, stating," *I found the course quite effective in teaching the necessary skills for Python. I had not used Python in a while, so this course was a nice refresher.*"

The second question: "What are things you like and do not like from the course?" The majority of the students appreciate the flexibility. One of the students wrote, *"I liked that the course was working at your own pace. It lets me slow down and understand what is going on in the course. If the course was timed, I would probably feel rushed and not learn as much about Python as I did.*" In addition, students also appreciated the videos. They were very straight to the point. Other students also appreciate the labs because they provide hands-on Python programming opportunities. In contrast, students disliked the exams because they were multiple questions. Students felt they could learn programming much faster with a real project, *not by memorizing syntax.* Another student expected *repetition* of the concepts before the final.

With the question, "Is the course appropriate for students with no programming language?" the majority of the students agreed. One student wrote," *I had no prior knowledge of computer programming language and found the course easy to understand.*" Another student acknowledged that programming is not for everyone, but the course helped, stating, "*Programming is tough to learn at first because you have almost to train yourself to think a different way.*" The final question asked students' opinions about Python for data analytics post-course. A student stated," *Before taking the course, I believed Python was too extreme and confusing for me to learn. Now I have a slight grasp of Python and how to use it, and I am excited to keep learning more.*" Python is new to many business students, so a hands-on approach to introducing Python will help them learn faster (Harnowo, Calhoun, & Monteiro, 2016; Harnowo A. , 2021). Another student stated," *Before, I did not think that it was a need, but after, I feel like it will be a beneficial tool that I can use for the rest of my life once I get better and learn more about it.*"

Pedagogical Benefits
There are multiple benefits of using the approach used in this paper. First, students are more prepared to learn Python programming in the semester. As discussed in the feedback, students' interest increased after seeing the relevance of their background. In addition, students realized that Python might not be as difficult as they perceived. A previous study suggests that perception and attitude are important factors determining the success of learning computer programming (Cheah, 2020). Second, instructors have more time to cover materials because the Python introduction is delivered in parallel with the regular class. Finally, instructors can benefit from the smooth transition to the technology used in the class. The lab in the MOOC course uses the same Jupyter Notebook used in the class.

CONCLUSION

This paper documents the author's experience blending a MOOC course into a face-to-face data analytics course in business schools. The course is Data Discovery and Management, and it covers finding appropriate data, ETL (Extract, Transform, Load) processes, data visualization, and text mining. Using a MOOC course is important to jump-start students' interest in learning Python because business students have limited programming backgrounds. The MOOC course covers Python Basics and libraries most often used for data analytics tasks.

Overall, the author received positive feedback regarding the use of the MOOC course. Their feedback confirms previous works cited in the literature review. Some students had preconceived ideas about Python and programming; they were afraid that programming was too complicated. Their perception changed after taking the course, and now they are ready to learn more. Experienced students also appreciated the course as it served as a refresher.

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Analysis of a VITA Program's Local Economic Impact

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ABSTRACT

Volunteer Income Tax Assistance (VITA) programs provide an important service to eligible community members. Students at one private university served within the structure of a 400-level Accounting course. The course not only included volunteer hours but also external requirements (such as the IRS certification exam) and opportunities for reflection on service learning. Anonymous data was collected by the students related to demographic information for the community members served and the refunds that were generated. The data was analyzed and interpreted using IMPLAN software. The direct benefits are the fees saved by community members who would have otherwise paid tax preparation services and any refunds that community members receive due a tax return that might have otherwise gone unclaimed. During spring 2021, students served 263 clients. The total economic benefits boosted the county's GDP by $97,000, added $46,000 to labor income and supported 1.4 jobs.

Keywords: Service learning, Volunteer Income Tax Assistance VITA, Economic impact

INTRODUCTION

Business courses are being designed to integrate service-learning experiences to provide students with a different type of educational experience than that they would receive from traditional lecture-based courses. The following literature review section provides insights into service-learning in higher education and its placement out in the community. The methods section provides details about the VITA-centered service-learning course that was created and the approaches to data collection and analysis that were utilized. The results section provides the results of the data analysis and the recommendations section provides concluding remarks and considerations for future research.

Service-Learning in Higher Education

By including academic elements such as stated objectives for projects and opportunities for reflection, service-learning utilizes community engagement to offer a comprehensive service experience for participants (Wakefield & Sissom, 2013). The concept of service-learning can incorporate anything from single day projects to long-term courses that are integrated into the curriculum. What sets service-learning apart is the inclusion of an intellectual focus and specific outcomes (Rama, Ravenscroft, Wolcott & Zlotkowski, 2000). The most effective service-learning opportunities are those that are carefully defined and are attempted only by qualified students, community members, and faculty members (Papamarcos, 2002). Overall success is dependent upon planning, timeliness, and the commitment of students, faculty, and university administration (Blanthorne & Westin, 2016).

Service-Learning in the Community

Students can work with either for-profit or non-profit community organizations in service-learning programs, with the key to the process being to keep the student at the forefront of a student-faculty-institution-community organization matrix (Thomas & Ambrosini, 2021). Block and Bartkus (2019) stressed the importance of service-learning in providing students with an understanding of the issues they will encounter when they begin practical work. Service learning has been successfully implemented in a variety of accounting courses, including Auditing, Governmental/Nonprofit Accounting, Intermediate Accounting, and Management Accounting (Still & Clayton, 2004; Gujarathi & McQuade, 2002; Zamora, 2011). By interacting with and working with community members while participating in a Volunteer Income Tax Assistance (VITA) program, Bootsma, Jeffrey, and Perkins (2021) found that students gained both technical and soft-skill knowledge about taxes. Tax preparation services are provided free of charge to residents who speak limited English, have a disability, and/or have an income below $57,000 (IRS, 2021).

METHODS

The School of Business at this small, private university designed an entire course around the VITA program's service-learning experience. It is intended to provide students in the school of business with practical experience. For academic credit purposes, Accounting 426 is taken as a general accounting elective. A maximum of twenty students are allowed to take the course each Spring, based upon the resources available to the students at the community partner

organization. University students undertake place-based service learning at the County VITA program's site. They serve as part of a volunteer team that includes retired and current working professionals. Students receive zero compensation from either the County or the University.

This study is from the 2021 Spring semester course. Prior to being allowed to work with community members, students reviewed IRS-prepared materials and passed a certification test. At the County VITA location, students prepared tax returns, reviewed tax returns prepared by peers, received feedback from the community organization staff, and interacted directly with community members to whom the tax preparation services were provided. To ensure a complete service-learning experience, students also completed academic assignments, including weekly discussions with the instructor and weekly journal entries.

Within the same business school, there is an economics service-learning course in which students prepare economic impact analysis for local non-profit organizations using IMPLAN software. Brooks & Schramm (2007) provide an excellent framework. This paper provides a synergistic use of IMPLAN software from an economics service-learning course to estimate the impact of an accounting service-learning course based on the anonymously-collected data.

RESULTS

Seven students participated in the data collection covering 263 clients. One key element to this study was students collected anonymous data related to certain line items on the tax returns that they completed. Table 1 provides summary data regarding the clients served. The typical client had no dependents. Average income was $25,453. Clients who received a refund averaged $1,419, with 12.2 percent of clients claiming the Earned Income Tax Credit.

Table 1: Summary data on VITA clients

Dependents	Number of households		Income bracket	Number of households
Zero	233		< $15,000	98
One	21		$15,000 - $30,000	77
Two or more	9		$30,000 - $40,000	30
			$40,000 - $50,000	23
			> $50,000	35

The VITA program encourages households to file a tax return, thereby collecting refunds that may have gone unclaimed. This generates household income, a portion of which is spent in the local economy. The VITA program provides its services at no charge. Clients are therefore able to use dollars that would have been spent on tax preparation fees for other spending. This income benefit to clients creates a new level of economic impact throughout the community.

To study the impact of the University's VITA participation, IMPLAN software was used. IMPLAN calculates the direct, indirect and induced effects in the local economy; it accounts for household savings, sales tax payments, and out-of-region purchases. This modeling is more precise than estimating economic impact by applying an average marginal propensity to consume to total tax refunds (Baryeh & Ezeka, 2021).

Income tax refunds totaled $303,722 and estimated fee savings totaled $26,037. Some of these dollars were saved, some spent in the local economy, and some spent elsewhere. Moreover, each dollar spent in the local economy created ripple effects. For example, a client bought an additional meal at a local restaurant, leading the restaurant to buy additional vegetables from a local farmer and provide additional tips to the food server. In total, the effects raised GDP in the County by $97,000, added labor income of $46,000 and supported 1.4 jobs. Clients primarily used the extra funds for housing and utilities. The housing may be owned, rented, or in a nursing facility. Table 2 lists the industries of primary impact.

Table 2: Economic impact from client fee savings and tax refunds

Top industries for value added (GDP)		Top industries for employment impact
Owner-occupied dwellings		Limited service restaurants
Tenant-occupied housing,		Nursing and community care facilities
Limited-service restaurants		Retail food and beverage
Nursing and community care facilities		Full service restaurants
Electric-power		Retail general merchandise stores

RECOMMENDATIONS

Spring 2021 was marked by in-person activity restrictions due to covid. The VITA on-site coordinator reported that the number of community members utilizing the service was noticeably less than in prior non-pandemic years. Students did not complete as many tax returns and, thus, interact with as many community members as they would have in a non-pandemic period. Future research could repeat the study during a time period without restrictions on in-person meetings. Despite the timing, this study shows that an Accounting service-learning course can have community benefits beyond the students and local clients. Increasing local GDP will support additional jobs through the new economic activity.

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Analysis of Student Outcomes for Course Objectives in a Required Database Course in an Accredited Program

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ABSTRACT

This paper examines the assessment of student objectives in a required database course at an accredited urban institution of higher learning. Using data collected on student outcomes from spring 2011 through summer 2022, the outcomes are evaluated using factorial Analysis of Variance methods as well as the Tukey-Kramer procedure to identify significance between pairs of means. The paper evaluates the outcomes based upon 943 students who were enrolled in forty-five class sections of the database course. The analysis measures the student performance based upon the six objectives defined for the course. The study concludes that there is little difference in the overall student outcome means of the six objectives. Students seem to perform consistently in all the evaluated categories of the course. Students who take the course online perform significantly lower in three of the six evaluation categories. Even though online students receive extensive resources, including videos and access to a tutor, they still do not perform as well as their counterparts who take the course live. As would be expected, students in the accelerated summer session perform significantly lower in three areas compared to those who take the course in the conventional sixteen-week semesters.

Keywords: Assessment of Student Outcomes, Defining Course Objectives. Online courses, Instructor-led courses

INTRODUCTION

Metropolitan State University of Denver is a large state-supported institution of higher learning located in downtown Denver, Colorado. MSU Denver shares a campus with the University of Colorado at Denver and The Community College of Denver. The University supports a wide variety of undergraduate and graduate programs. Courses are offered during the spring, summer, and fall semesters. The University is strictly a commuter school that offers no student housing (although private housing for students is offered nearby). Courses are delivered in both the live, instructor-led classroom format and the online format. The University is designed to support the seven-county metropolitan area and is a designated Hispanic Serving Institution. Through its six departments, the College of Business offers ten undergraduate bachelor of science degrees and four undergraduate bachelor of arts degrees as well as a masters of business administration degree. The College of Business is accredited by AACSB. The Computer Information Systems program housed within the Department of Computer Information Systems and Business Analytics (CISBA) is also accredited by ABET. The CISBA Department offers undergraduate degrees in both Computer Information Systems and in Business Intelligence. ABET requires that accredited programs develop and maintain program and student objectives and that there is an assessment process for ensuring that these objectives are met. The CISBA Department must submit documentation to ABET that demonstrates how the program objectives have been met. This paper focuses on the Database Management Systems (DMS) course that is taught by the author. DMS is a junior level course that is required for all CISBA majors and minors. Although most of the students enroll in DBS to fulfill a major or minor requirement, a few students from random areas of the University also enroll.

The DBS course is available in two different versions and is taught in all semesters. However, the stated objectives for the course must always remain the same regardless of the delivery method or the semester. There should be a single expectation of student performance in the course. The instructor-led version involves classroom demonstrations of database theory and implementation. Students are asked to participate. The instructor can evaluate the student learning in real time and make adjustments as necessary. The online version of the course is generally not interactive. While a few Microsoft Teams lectures are offered, not all students can attend. Even though some online students view the recording of the live lectures, they cannot actively participate. Online students are provided with a wide variety of supplements to help them understand the material. There are links to many instructional videos. Slides developed by the instructor and the power point slides provided by the textbook author are available to the students. The instructor is available both online and in office to students. There is generally a tutor available both at the University and on Microsoft Teams to assist online students. Peer interactions among online students are generally encouraged and a multithreaded discussion page is available. While online students have an abundance of resources to help them succeed, online learning still requires a great deal of motivation on the part of the student learner.

The regular semesters at MSU Denver run for sixteen weeks while the summer semester runs for eight weeks. Therefore, the summer semester moves exactly twice as fast as the regular semesters. Student learners who choose to accelerate their progress often enroll in these summer semester courses. While the learning objectives and the expectations do not change in the summer semester, student performance with regard to the objectives may be lowered.

This paper provides a statistical analysis of the assessment of the six formal course objectives for DMS. Data have been collected on student performance on the course objectives from the spring semester 2011 through the summer semester 2022. Even though there have been slight changes in the objectives, the core content of the objectives have changed little. A consistent data set of the course objectives and the student performance on these objectives has been created. Using the Tukey-Kramer procedure, statistical differences among the six objectives have been analyzed. Using the factorial Analysis of Variance method, differences in student performance among instructor-led and online and among different semesters, are analyzed.

BACKGROUND AND ANALYSIS

The DMS course provides the student with a broad background in an important area of the information systems' discipline. The learning objectives from the course provide a basis for other upper-level courses within the CIS program. Database concepts and implementation would be especially valuable to students enrolled in the final capstone course required of all students majoring in the program. Not only is the DMS course required of all majors and minors in the CIS program, it is also required for students majoring in the Health Care Management program. The DMS course can also be substituted for another required database course by students majoring in geographic information systems.

Learning can occur at many levels. The skills needed to assess a set of user views and then create a working model of a database would differ from the set of skills required to memorize and then recall information. The effective design of the database would require students to understand basic sets of rules and be able to make important choices at critical junctures during the process. Students would be required to recognize new information brought into the process and to modify the design based upon this new information. Implementing a well-designed database in a complex software environment would require another set of skills. Student learners would need to understand how to interact with the computer software to create a structure that would contain the current data of the database, be able to handle all changes to the data and its structure and support all reasonable queries on the data. Another set of skills would require that student learners understand the needs of the end users and be able to retrieve the required data in formats deemed acceptable by the end users. Finally, student learners would be required to have fundamental understandings of all aspects of database such as business intelligence and distributed database structures.

Assessing student learning can be difficult. Student learning objectives for the course require that a mechanism is in place to assess how well the student has mastered the objectives. Painter and Wlliford state: "Learning outcomes describe measurable knowledge, skills, and behaviors that students should be able to demonstrate as a result of completing the program." (Panter and Williford 2018, p. 3). The learning objectives for the course must be measured by some evaluation instrument. As stated by Garfolo and L-Huillier, the objectives must be measured and there needs to be a level of proof that the learning has taken place: "Ultimately, assessment (for accreditation) is conducted to bring about improvement at all levels from course-to-program-to-the-institution. This is accomplished by establishing clear and measurable outcomes of student learning and by documenting and demonstrating that student learning has occurred." (Garfolo and L'Huillier 2015, p.153).

The course learning objectives must also have the expectation of leading to continuous improvement. Painter and Williford further state: "Assessing learning outcomes is a form of program and curriculum evaluation with the goal of continuous program improvement." (Panter and Williford 2018, p. 4). A statement by ABET also echoes the importance of continuous improvement. The statement from the ABET Manual reflects the importance of assessment activities: "Assessment of student learning, with a focus on continuous improvement, is key to ensuring the quality of our educational programs and preparing our graduates to enter a global workforce." (ABET Manual 2022). The ABET Manual also concludes: "In an era of accountability and transparency, outcomes assessment has become an international standard of quality." (ABET Manual2022). Ultimately, being able to measure and quantify the student learning outcomes of the course and then to analyze the student learning outcomes is considered a highly important undertaking.

DATA FOR THE STUDY

The data for this study were collected from students in forty-five DMS courses over the time period from spring 2011 through summer 2022. All of the data come from the courses taught by the author so there would be no bias from multiple instructors. Courses were categorized by delivery method (Instructor-led or Online) and by semester (Fall, Summer, or Spring). Each course objective was assessed by at least two assessment methods for all courses. Objective questions used for the quizzes and exams were identified as assessing one of the objectives. Most, but not all, of the quiz and exam questions were associated with a specific course objective. Many of the questions were objective (multiple choice or matching). Many of the questions were problem-solving requiring students to respond to various hypothetical circumstances. Students were required to produce a fully normalized database structure from a set of user specifications and to produce the corresponding entity-relation diagram for course evaluation. Students were also assessed on their ability to respond to user requests for specific information and to write the appropriate database queries. No single question was associated with more than one course objective. While questions differed from semester to semester, each assessment was designed for a standardized level of difficulty. Students were required to complete two assignments that required an in-depth understanding of a conceptual database. Students were required to normalize a hypothetical set of data and structure the data so that it represented a functional operational database. The third assignment required students to implement the database on the University's Oracle database system. The students were required to create all relevant tables enforcing all keys and constraints. After the structure of the database was created, the students were required to enter all of the data. The final two assignments were designed to have the students manipulate the data including writing complex ad hoc queries and generating managerial reports.

While there were minor changes at a couple of points over the time period of the study, the major conceptual objectives remained intact. Student objectives have included conceptual database development, database implementation and manipulation, distributed databases, transactions management, and business intelligence concepts. Big data analytics objectives were added to the business intelligence objectives many years ago. A file management objective no longer exists and has been eliminated from the study. The data for the objectives have been carefully vetted for consistency for the years throughout the study. There were 580 online and 363 instructor-led students who participated in this study. Table 1 lists the objectives formally defined for the course and analyzed in this paper. The outcomes for these objectives are consistently evaluated throughout this paper.

Table 1:   Course Objectives for Database Management Systems (DMS) Course

1.	Analyze a set of user requirements and develop a workable, normalized relational database design presented with an Entity Relation Diagrams (ERD).
2.	Implement an electronic relational database from a set of user specifications using Data Definition Language (DDL).
3.	Develop applications and manipulate data using structured query language (SQL).
4.	Understand the basics of distributed database management systems and compare and contrast with centralized database management systems.
5.	Understand the importance of transaction management and establish concurrency control measures to maintain a consistent state database.
6.	Demonstrate an understanding of Business Intelligence and Big Data Analytics.

All course objectives are based upon a percent scale. If a student were to correctly answer all of the questions related to a given objective, the student would score 100 percent as an outcome for that objective. Questions of an objective type (e.g. multiple choice) were assessed as binary (right or wrong) while problem solving type of questions were assessed on a subjective basis with partial credit allowed. The scores for each student were weighted by the points assigned to each question with the descriptive statistics reported for each of the forty-five sections being studied and for each of the six course objectives.

The descriptive statistics presented in Table 2 and Table 3 represent the statistics computed for each of the categories for each of the course objectives. For example, the mean of 75.26 in the first line of Table 2 is the mean of the seventeen course means for the instructor-led courses in the study. The means and standard deviations are reported as well as the conventional five number summary. The value of N denotes the number of sections that are included in category. For example, there were seventeen instructor-led and twenty-eight online sections.

Table 2: Descriptive Statistics of the Objectives by Delivery Method

Delivery	Objective	Mean	St.Dev.	Min Value	First Quartile	Median	Third Quartile	Max Value	N
Instructor Led	1	75.26	3.59	70.35	71.38	76.36	77.61	81.55	17
	2	73.53	10.78	45.24	69.04	75.38	82.55	85.45	17
	3	72.81	5.67	64.06	67.74	72.92	77.80	81.02	17
	4	71.63	5.96	59.62	68.31	70.88	74.50	83.67	17
	5	74.74	5.83	64.55	69.71	76.53	78.77	84.76	17
	6	66.69	14.04	47.86	57.20	61.90	78.44	94.89	17
Online	1	64.79	6.91	50.38	60.60	65.29	67.69	85.47	28
	2	67.54	5.57	51.27	65.93	69.01	71.17	75.65	28
	3	69.60	5.06	54.60	66.68	71.09	73.15	77.91	28
	4	75.05	8.33	45.83	73.03	77.37	79.30	85.71	28
	5	70.17	11.46	48.75	60.19	72.27	79.99	86.62	28
	6	64.78	15.06	29.63	53.35	60.88	80.98	87.83	28

Table 2 presents the summary of the descriptive statistics developed from the forty-five courses categorized by

Table 3: Descriptive Statistics of the Objectives by Semester.

Semeste	Objective	Mean	St.Dev.	Min Value	First Quartile	Median	Third Quartile	Max Value	N
Fall	1	69.99	7.91	50.38	65.29	70.35	77.09	81.55	17
	2	70.79	8.46	51.27	68.25	71.22	75.51	85.45	17
	3	73.13	4.77	66.74	68.67	72.96	77.76	81.02	17
	4	73.26	8.49	45.83	70.76	72.96	77.78	83.67	17
	5	73.71	10.43	48.75	67.16	77.38	79.91	86.62	17
	6	72.31	14.83	50.24	58.38	73.57	85.06	94.89	17
Summer	1	63.18	6.73	53.59	57.04	63.54	67.03	75.60	9
	2	66.36	6.74	53.59	60.46	69.23	71.25	71.88	9
	3	66.09	6.31	54.60	61.33	65.70	71.83	74.16	9
	4	75.44	9.57	55.84	68.83	78.03	82.32	85.71	9
	5	65.82	10.78	49.57	56.07	67.50	72.27	84.38	9
	6	57.01	11.63	29.63	54.61	59.52	63.38	71.70	9
Spring	1	70.27	7.24	58.47	63.62	71.00	74.93	85.47	19
	2	70.56	8.92	45.24	67.35	69.04	75.59	85.45	19
	3	70.99	4.36	64.06	66.67	71.39	74.44	79.66	19
	4	73.42	6.01	59.62	68.60	73.68	78.48	81.49	19
	5	73.15	8.24	56.19	67.00	76.19	79.13	83.01	19
	6	63.43	13.32	44.81	51.65	60.71	72.35	87.83	19

delivery method. The mean of the instructor-led objectives represents the mean of the seventeen section means in this category. The instructor-led students performed better than the online students for all of the course objectives except

for the fourth objective. The means of the first three objectives are higher than the means of the last three objectives for the instructor-led students. However, the means of the objectives for the online students do not appear to vary much over the six objectives except for the fourth objective.

Table 3 presents the summary of the descriptive statistics categorized by the semester. Except for objective 4, students in the summer session appear to perform poorly on the course objectives compared to students who took the course over the regular semesters. The summer sessions are completed in eight weeks compared to sixteen weeks in the spring and fall. Completing the course in the summer session in half the time of the regular semester appears to result in poorer outcomes. Also, summer courses are normally delivered in the online format.

METHODOLOGY

The DMS course consists of six different course objectives. The first three course objectives are highly analytical involving high-level theoretical concerns and highly technical computer coding abilities as well as an understanding of the end users in the business environment. The last three course objectives are covered in a more general, survey sense. However, student performance on all of the objectives should adhere to the same standards. Students should perform equally well on all course objectives. No single course objective should be slighted. There is an expectation that student learners perform equally well on all course objectives.

Although course objectives apply equally to both the instructor-led and online versions of the course, the courses are not the same. The online delivery method meets twice a week in a classroom setting with the instructor. Students are encouraged to participate in the course. Examples of normalization problems are developed in class with the participation of students. Students are encouraged to ask questions. The instructor provides live demonstrations for the creation and manipulations of the electronic database. Students also interact with one another during the live classroom sessions. Passive learners benefit greatly from the live, instructor-led classroom environment. Although the CISBA Department goes to great lengths to create a robust learning environment for online learners, it is impossible to truly replicate the classroom experience. While online learners are given substantial resources, they must remain highly active and motivated to succeed. Online learners have access to an extensive set of resources including links to articles, links to videos, multithreaded discussion networks, and access to the instructor and to a tutor. However, online students are expected to perform at the same level as the instructor-led students and are assessed by the identical set of standards.

Students are expected to maintain identical standards regardless of when they are enrolled in the course. Even though the summer semester moves twice as quickly as the fall and spring semesters, there would be an expectation that the student learners would meet the same objectives. Students in the summer semester receive the same resources from the CISBA Department as do the student learners in the full-term semesters. The same resources are linked through the Canvas web site and both the instructor and the tutor are available. Differences in performance between the summer semester and the regular semesters would likely be linked to the effort put forth by students who enroll in the course in the summertime.

The first test examines the difference in the means among the six different course objectives. If each course objective is considered equally important to the others, then there should be no significant difference in the reported means of the objectives. To test the differences among the means of the six objectives, a one-way ANOVA test is conducted to test for a difference in the value of the six course objective means. If the ANOVA test shows that a difference does exist, the Tukey-Kramer procedure will be used to uncover the pairs of means that are significantly different. Below are the null and alternative hypotheses that will be tested.

(1) H_o: the overall mean scores of the course objectives are equal for all course objectives.
H_a: at least one of the overall means scores of the course objectives differs from the others.

A one-factor ANOVA model examines the effects of the mean course objective scores on the delivery method of the of the course. A cursory examination of the data seems to indicate that the instructor-led students perform better on five of the six course objectives. For each of the six course objectives, the mean score for the instructor-led courses with be hypothesized equal to the mean score of the online version. The following hypothesis will be examined for each of the course objective mean scores.

(2) H$_o$: the mean of each course objective is equal for each of the delivery methods.
    H$_a$: the mean of a course objective is different for a given delivery method.

The third test examines the differences in the course objective means categorized by the semester in which the course was taken. Again, looking at the data, it appears that the students who took the DMS course during the summer performed poorly compared to those who enrolled in the course during the spring or fall semesters. A one-way ANOVA model hypothesizes that each of the six course objective mean scores are equal for over each semester. The alternative would indicate that at least one of the semesters would have a significantly different mean score for one or more of the course objective mean score.

(3) H$_o$: the mean of each course objective is equal for each of the semesters.
    H$_a$: the mean of a course objective is different for a given semester.

RESULTS

Table 4 shows the results of Hypothesis Test 1. The F-ratio of $F(5,264) = 4.11$, $p < .01$ is significant indicating that at least one pair of means for the course objectives differs. Because the ANOVA test produced significant results, the Tukey-Kramer procedure was used to find the pair or pairs that were significantly different.

Table 4: ANOVA Results for the Equality Means of the Course Objectives.

Source	Df	Sum of Squares	Mean Square	F-Value	P-Value
Objectives	5	1,811	362.12	4.11*	0.001*
Error	264	23,238	88.02		
Total	269	25,048			

* represents a value significant at the alpha = 0.05 level.

The results of the Tukey-Kramer procedure are shown in Table 5. The table shows the overall mean of each of the course objectives as well as the lower and upper bounds of the 95% confidence interval. The pair-wise t-test for each pair of means concluded that only two pairs of course objective means were significantly different. The difference between the sixth course objective mean was significantly different from fourth course objective mean [$t(44) = -4.11$, $p < .01$]. Also, the difference between the sixth course objective mean was significantly different from the fifth course objective mean. [$t(44) = -3.23$, $p = .015$].

Table 5: Confidence Intervals for Objective Means from Tukey-Kramer.

Objective	N	Mean	St.Dev.	95% Confidence Interval	
				Lower Bound	Upper Bound
1	45	68.74	7.77	65.99	71.50
2	45	69.80	8.36	67.05	72.56
3	45	70.82	5.47	68.06	73.57
4	45	73.76	7.64	71.01	76.52
5	45	71.90	9.89	69.14	74.65
6	45	65.50	14.55	62.75	68.25

A factorial ANOVA was conducted to compare the effects of the course delivery methods on the mean scores students earned on each of the course objectives. Table 6 presents the results of Hypothesis Test 2. Course objective 1 is the objective associated with the development of the normalized database structure from the set of user requirements. Instructor-led students earned a mean score on objective 1 that is 10.47 points higher than the mean score earned by the online students. The 10.47 point difference is highly significant yielding a F-ratio of $F(1,43) = 33.34$, $p < .01$. This result indicates that there is strong statistical evidence that online student learners on average are not as qualified as their instructor-led counterparts to analyze user input and create a working database design. The second course objective (implement an electronic structure of a database) also concludes that instructor-led students perform significantly better than online students with an F-ratio of $F(1,43) = 6.06$, $p = .018$. The means of

the third course objective (the ability to manipulate the data and respond to user requests) were significantly different at the ten percent level of significance with a F-ratio of $F(1,43) = 3.88$, p = .055.

Table 6: Factorial ANOVA Results for the Impact of the Delivery Method on the Objective Means

	Instructor Led (N = 17)		Online (N = 28)		Difference in		
Objective	**Mean**	**St.Dev.**	**Mean**	**St,Dev.**	**Means**	**F-Value**	**P-Value**
1	75.26	3.590	64.79	6.91	10.47	33.34	0.000[1]
2	73.53	10.78	67.54	5.57	5.99	6.06	0.018[1]
3	72.81	5.67	67.54	5.57	5.27	3.88	0.055[2]
4	71.63	5.96	75.05	8.33	-3.42	2.18	0.147
5	74.74	5.83	70.17	11.46	4.57	2.32	0.135
6	66.69	14.04	64.78	15.06	1.91	0.18	0.675

1.　represents values significant at the alpha = 0.05 level.　　2.　represents values significant at the alpha = 0.10 level.

Table 7 reports the results of the means of the course objectives based upon the semester the course was taken. The means are the lowest in the summer semester for all of the objectives except for the fourth course objective. The difference is significant for the first course objective (designing the database from end user requirements) with and a F-ratio of $F(1,42) = 4.09$, p = .024. The third course objective measures the ability of the student to use the electronic database to write queries that respond to user requests. The mean score of the third course objective for the summer semester is significantly lower than the mean scores of the regular semester ($F(1,42) = 6.00$, p < .01).

Table 7: Factorial ANOVA Results for the Different Semesters and the Objective Means

	Fall Semester (N = 17)		Summer Semester (N = 9)		Spring Semester (N = 19)			
Objective	**Mean**	**St.Dev.**	**Mean**	**St.Dev**	**Mean**	**St.Dev**	**F-Value**	**P-Value**
1	69.99	7.91	63.18	6.73	70.27	7.24	3.18	0.052[2]
2	70.79	8.46	66.36	6.74	70.56	8.92	0.96	0.392
3	73.13	4.77	66.09	6.31	70.99	4.36	6.00	0.005[1]
4	73.26	8.49	75.44	9.57	73.42	6.01	0.26	0.769
5	73.71	10.43	65.82	10.78	73.15	8.24	2.26	0.117
6	72.31	14.83	57.01	11.63	63.43	13.32	4.09	0.024[1]

1　significant at the alpha = 0.05 level.　　2　significant at the alpha = 0.10 level.

Table 7 reports the results of the means of the course objectives based upon the semester the course was taken. The means are the lowest in the summer semester for all of the objectives except for the fourth course objective. The difference is significant at the 0.10 level of significance for the first course objective (designing the database from end user requirements) with and F-ratio of $F(2,42) = 3.18$, p = .052. The difference in the means for course objectives 3 and 6 are significant with a level of significance of 0.05. The F-ratio of course objective 3 (writing queries and responding to user requests is $F(2,42) = 6.00$, p < .01. The F-ratio for the sixth course objective (business intelligence and big data analytics) is $F(2,42) = 4.09$, p = .024.

CONCLUSIONS

This paper examines the outcomes of the stated objectives for a required database course in both an AACSB and ABET accredited program at an institution of higher learning. The six course objectives were examined through the time period beginning in fall semester 2011 and running through the summer semester 2022. All objectives were measured by objective quiz and exam questions, problem-solving exam questions and projects. All course objectives were evaluated by at least two different methods. The course objectives were scored on a percentage scale evaluated on questions and problems being evaluated by the quality of the student response.

First the mean scores of each of the six course objectives were evaluated to determine if differences existed among the individual means. With a couple of minor exceptions, the means of the course objective scores were not statistically different. One might conclude that the proper amount of time and effort is being dedicated to each of the objectives. The mean scores of the course objectives were evaluated by two different categories (or factors) through an ANOVA process. Examining the mean scores based upon the delivery method of instructor-led courses and online courses, the online student learners performed at a lower level than the instructor-led learners on the critical objectives of designing a functional database from user requirements, implementing the electronic database using commercial software, and responding to user requests. The mean scores of the course objectives were also evaluated with an ANOVA model based upon the semester the course was taken. When the course was taken in the shorter summer session, student learners performed at a lower level than did students who enrolled in the course in the regular semesters.

Assessment activities generate information that suggests where the instructors and course coordinators should devote their efforts to improve student performance in areas where issues exist. An evaluation of the assessment results would normally lead to adjustments that would bring about continuous improvement. AACSB calls this "closing the loop". In response to some of the relatively lower performances for some course objectives, the DMS course curriculum has been modified to include stronger modules for both Business Intelligence and Big Data Analytics. Professors who teach the DMS course regularly participate in the annual Training Days sponsored by the Rocky Mountain Oracle User's Group. To enhance instruction, DMS course faculty also participate in seminars and conferences dedicated to teaching database systems. To further improve student learning, the CISBA Department has a dedicated computer lab that is used for upper division information system courses. Finally, the course objectives and other materials are regularly evaluated by the DMS faculty for currency and modified if necessary.

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Changing Business Student Perspectives of Individual Factors in Online Versus Face-to-Face Education: Impact of the Pandemic

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ABSTRACT

At an AACSB Jesuit, Catholic University with a strong focus on teaching, business student perceptions regarding online versus face-to-face (FTF) courses were surveyed in 2012, 2018 and 2021 during the pandemic. Since research indicates that perceptions change over time, this study evaluates the changes in individual perceptions over this time period. Individual factors of motivation, discipline, self-directed, independence, schedule flexibility, time investment, cost investment, happiness, appropriateness and preference of online versus face-to-face education, are presented. This research has implications for instructors and administrators.

Keywords: Student Perceptual Changes, Individual Factors, Online, Face-to-Face

INTRODUCTION

Student and instructors' perceptions of online learning and course structure are fundamental to student satisfaction (Beach, 2018; Blau et al., 2017; Eom & Ashill, 2016; Gering et al., 2018). Consequently, as technology is increasingly being used in one format or another for instructional purposes, research on student perceptions of the use of technology in education continues (e.g. Allen & Seamen, 2013, Baker & Unni, 2018; Barnes, 2017; Fish & Snodgrass, 2015; Guest et al., 2018; Perreault et al., 2008; Tanner et al., 2003; Tanner et al., 2004a, 2004b; Tanner et al., 2006, Tanner et al., 2009; Tratnik et al., 2019). Such research is critical since often, administrators believe face-to-face (FTF) and online education are equivalent (Allen & Seamen, 2013). Assuming that administrators are correct, then students and instructors should be indifferent to all educational factors. However, prior research indicates that student perceptions are mixed and does not support this indifference. For example, at an AACSB-accredited business school, over 65% of students strongly disagreed or disagreed that learning is greater from online courses (Kuzma et al., 2015). Additionally, it is expected that instructor and student perceptions will continue to evolve as technology evolves (Richardson et al., 2016). Theoretically, the more someone is exposed to and uses a particular technology or method, the more adept they become (Dobbs et al., 2009; Tanner et al., 2003; Tekinarslan, 2011). In support of this, research has shown that student perceptions to online education have changed over time (e.g. Allen & Seaman, 2013; Benbunan-Fich & Hiltz, 2003; Perreault et al., 2008; Tanner et al., 2003; Tanner et al., 2004a, 2004b; Tanner et al., 2006; Tanner et al., 2009). Most of these studies are much older and prior to current technology which encourages real-time synchronous communication and a wide variety of interactive components in education and prior to the pandemic.

Following the pandemic, higher education will look very different than prior to the pandemic. An understanding of instructors' and students' perspectives and their differences is needed as results may guide future online pedagogy, instructional strategy and technology integration to support online learning (Redman & Perry, 2020). As part of a larger study, one full year into the pandemic (April 2021), instructors and students were surveyed again on their perspectives. This study offers insight into changes in student perspectives on individual factors from prior to the pandemic (2012 and 2018 student perspectives) to during the pandemic. The question for this study is: *Have students' – those that have taken and those that have not taken an online course – perspectives of online education compared to face-to-face (FTF) education changed from 2012 and 2018 to 2021?* The pandemic has altered nearly every aspect of our lives. Therefore, the question before educators is '*what will education 'look like' in the future?* Instructor and student perspectives will shape the answer to this question.

REVIEW OF THE LITERATURE: INDIVIDUAL FACTORS UPDATE

This literature review is not intended to be a comprehensive review of students' perspectives. (For interested readers, a deeper literature review on the individual can be found at Fish & Snodgrass (2014).) Research on perspectives reveals three broad categories of factors that may impact upon students' perspectives of education: demographic, individual and program. Demographic questions for students included questions on gender, age, class rank (undergraduate – freshmen, sophomore, junior, senior or graduate), undergraduate major or graduate program and

potential concentration (graduate), online experience, self-reported level of technological understanding, whether the student was a transfer student, and if the student took an online course, the number of online courses taken. Individual factors studied are specific to the individual include motivation, discipline, self-directed learning and independence, schedule flexibility, time and cost investment, preference, happiness and appropriateness for learning environment. Program factors, which are decisions that the instructor makes in developing the course, studied include academic difficulty, academic integrity (cheating), student-to-instructor interaction, student-to-instructor interaction, and program technologies. Student attitudes and perceptions are important antecedents of the student's inclination toward online learning (Chawla & Joshi, 2012), and our purpose here is to highlight recent research on student perspectives on the individual factors.

Student motivation, discipline, self-directed learning and independence. In general, students are more motivated in courses when the content interests them and find material to be relevant (Adler et al., 2001). Prior research on student motivation reveals mixed results as some note increased motivation online (Kearsley, 1996; Larson & Sung, 2009), while others note decreased motivation online (Carr, 2000; Lei & Gupta, 2010; Maltby & Whittle, 2000); and low student satisfaction (Kenny, 2003; Muilenburg & Berge, 2005). Online learning can be effective for motivated, self-disciplined and organized students (Jacob & Radhai, 2016), for students who prefer more independent work (Smart & Cappel, 2006), and for students who are predisposed to self-directed learning and self-discipline (Tratnik et al., 2019) as online courses require more self-directed learning (Weldy, 2018). Online students argue that online allows them to plan their time and study effectively as online is more self-directed (Kirtman, 2009)**.** Regardless of the environment, some students regard collaborative learning negatively and always prefer to work independently (Hiltz & Turoff, 2005). Students from collective cultures may prefer group work, while students from individual cultures may prefer to work independently as shown by a study comparing U.S. students who preferred independent work to Chinese students, who preferred group work (Lin et al., 2010).

The 2012 and 2018 online and FTF student perspectives for motivation and independence were the 'same' as both groups were more motivated FTF and were relatively indifferent on independence (Fish & Snodgrass, 2014; 2020). From 2012 to 2018, students' perspectives of discipline and self-directed the perspectives changed and preferred different educational modalities. In 2012, both student groups were indifferent to the discipline in the environments, but by 2018, students preferred their respective environment. With respect to self-directed, both groups originally preferred FTF; however, by 2018, the online group preferred online more, while the FTF group preferred FTF more. Therefore, we pose the following research question: Given the significant increase in the number of students taking courses online due to the pandemic, *have business students' perceptions of the motivation, discipline, self-directed nature or independence required online versus FTF changed?*

Schedule Flexibility. Schedule flexibility – and convenience - are often noted as driving factors as to why students choose online classes (Dobbs et al., 2017; Kirtman, 2009; Mather & Sarkans, 2018; Nguyen, 2015; Platt et al., 2014; Xu & Jaggers, 2013). Online students emphasized flexibility, accessibility, convenience of balancing personal, professional and academic life and their desire to experience new way of learning (Mather & Sarkans, 2018). Online learning offers convenience compared to FTF and schedule flexibility (Xu & Jaggars, 2013) and less distractions. The asynchronous feature of online courses provides students more flexibility to access and complete course material and is main reason contributing to online demand (Dobbs et al, 2017). Mature students with competing priorities and those who have to travel long distances tend to prefer online delivery (Mather & Sarkans, 2018). In both the 2012 and 2018 studies, online and FTF students both favored the online environment for schedule flexibility (Fish & Snodgrass, 2014; 2020). Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of schedule flexibility online versus FTF changed?*

Time and Cost Investment. As for time management, research results are mixed as some results indicate that online students tend to indicate they spend more time online (Dobbs et al., 2009; Lovern & Lovern, 2013; Perreault et al, 2008), while other studies indicate that FTF students feel they spend more time (Weldy, 2018). In one study, online learners understood the need for being responsible for their learning and time management (Nguyen, 2015). In yet another study, online students noted that online allows them to plan their time and study effectively as online is more self-directed (Kirtman, 2009). In another study, results indicated that online students were more predisposed to time management than FTF students (Tratnik et al., 2019). However, another study noted that FTF students indicated that they required less time for content clarification than online and there were more technical issues for online courses (Lovern & Lovern, 2013). Several studies note the cost-effectiveness to the individual and institutions and individuals

in offering and taking online courses (Nguyen, 2015; Smith et al., 2019). Cost savings are fueling the demand for online (Nguyen, 2015).

In the original 2012 survey, students indicated that the FTF environment required more time and more cost investment (Fish & Snodgrass, 2014). By the follow-up survey, students continued to feel that the FTF environment required more cost than online (Fish & Snodgrass, 2020). However, by 2018, a significant difference between the two groups existed with respect to time investment as the online group was indifferent, but the FTF students indicated that FTF required more time (Fish & Snodgrass, 2020). Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of time and cost investment of online versus FTF changed?*

Preference. Researchers into student success have argued for the need to include student perspectives, attitudes, or preferences towards the instructional format itself (Buchanan & Palmer, 2017; Ganesh et al., 2015; Gundlach et al., 2015; Keramidas, 2012). Similar to other factors, the results on preference remain 'mixed'; however, in prior studies, most students indicate a preference toward FTF instruction (Lee et al., 2017; Pointer et al, 2019; Tratnik et al., 2019). Students preferred FTF for transfer of content-based knowledge and skills, in scientific work routines, and for communication purposes (Paechter & Maier, 2010). Graduate business students indicated a preference for FTF as they felt they learned more in the FTF environment than online (Lee et al., 2017). Most students do not perceive online and FTF classes to be equivalent; however, students who experienced online classes were positively associated with perceptions of general equivalence or were more amenable to taking another online course (Dobbs et al., 2009; Mather & Sarkans, 2018; Platt et al., 2014). Some online student preferred online learning for providing a clear, coherent content structure, and supporting self-regulated learning, flexibility and self-monitoring (Paechter & Maier, 2010). Graduate students who indicated a preference for online learning cited online as a new way to learn and instructor responsiveness as factors for their choice (Lee et al., 2017). In our prior studies, online and FTF students preferred to be in the FTF classroom (Fish & Snodgrass, 2014, 2020). Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of preference for online versus FTF changed?*

Happiness and Appropriateness for Learning Environment. Student happiness between the two environments remain 'mixed'. Some studies indicate that student effectiveness is equal across the modalities (Cavanaugh & Jacquemin, 2015; Horspool & Lange, 2012; Larson & Sung, 2009; Ni, 2013; Stack, 2015; Zacharis, 2010), while others show a preference to FTF (Evans, 2015; Flanagan, 2014; Gratton-Lavoie & Stanley, 2009; Mahmood et al., 2012; Trawick et al., 2010), and others show a higher satisfaction for online learning (Gratton-Lavoie & Stanley, 2009; Harmon et al., 2014; Means et al., 2010). These mixed results continue to warrant additional investigation as tools and techniques for online instruction continue to be developed and improved (Weldy, 2018).

In the original 2012 study, FTF students were overwhelmingly positive to FTF education and online students also favored FTF education over online (Fish & Snodgrass, 2014). On average, online students were undecided about the appropriateness of online education at the University, while FTF students tended toward indicating that online was inappropriate. The 2018 survey revealed a change in perspectives as the online students were much happier with the online environment than they were before and FTF students were not as happy as in 2012 (Fish & Snodgrass, 2020). By 2018, most online and FTF students agreed that online was appropriate at the University. Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of happiness and appropriateness of online versus FTF changed?*

Salient Conclusions for Our Study. As we noted previously, this literature review is not intended to be a comprehensive review of the research on student individual factors, but rather an updating of the status. The ambiguity and 'mixed' results on several factors from our prior studies remain. Additionally, most of these studies occurred prior to the pandemic when many students had not experienced online education. The pandemic changed this perspective. In light of the change to significantly more students experiencing online education, have student perceptions on individual factors changed? Its important to note that survey was distributed over a year into the pandemic, and therefore, students had time to adjust to online education. We intend to address the basic questions developed above as the basic question regarding the current status of students' perspectives on online versus FTF education at this University. Specifically, our Research Questions addressed within this paper are:

#1) Do online and FTF students' perspectives of online versus Face-to-Face education on individual factors differ?

H_{10}: Business students' perspectives for individual factors of online education are *the same* as their perspectives of FTF education.

H_{11}: Business students' perspectives for individual factors of online education are *not equal* to their perspectives of FTF education.

#2) Have online students' perspectives of online versus Face-to-Face education changed from 2018? 2012?

H_{20}: Online business students' perspectives for individual factors of online education are *the same* as their perspectives of FTF education as in 2012 and 2018.

H_{21}: Online business students' perspectives for individual factors of online education are *not equal* to their perspectives of FTF education as in 2012 and 2018.

#3) Have FTF students' perspectives of online versus Face-to-Face education changed from 2018? 2012?

H_{30}: FTF business students' perspectives for individual factors of FTF education are *the same* as their perspectives of online education as in 2012 and 2018.

H_{31}: FTF business students' perspectives for individual factors of FTF education are *not equal* to their perspectives of online education as in 2012 and 2018.

With the significant change to online education due to the pandemic, we are addressing the basic question "*have business students' perceptions changed?"*

As demonstrated in the original study, students clearly preferred FTF education over online, and students' acceptance of online education may increase as the number of online courses they take increases (Fish & Snodgrass, 2014). In 2018, students at the same University completed the same survey as in a prior 2012 study on online versus FTF perspectives (Fish & Snodgrass, 2020). Results demonstrated a shift in a few, but not all, of the student individual perspectives. Noted changes in the significance level occurred in students' perception of discipline, self-directed, time happiness and appropriateness of online. These studies occurred *prior to the pandemic,* and most comparisons occurred from the FTF perspective. As the pandemic began, courses moved mid-semester from FTF to online. Students and instructors were forced to complete the courses in a new modality – with the original FTF goals and objectives. Clearly, these were not true 'online courses.' Differences between online and FTF modalities include pedagogical aspects such as teaching fundamentals, developing a relationship with students, providing stimulating content, and timely feedback (Brocato, Bonanmo & Ulbig, 2015). The University was able to offer FTF classes in the fall 2020, and therefore, a few instructors and students have not experienced a specifically-designed online semester course. However, the pandemic forced most students to experience an online course, whether they wished to prior or not.

As noted in our previous research (Fish & Snodgrass, 2014, 2020), perceptual studies differ in the size (small, medium, large universities), audience (e.g., scientific versus social sciences, business versus non-business, and graduate versus undergraduate), and method of research (e.g. interview, survey). The context of the study may be an important factor to consider in interpretation of the survey results, and the results presented here represent another datapoint in a complex continuing situation.

METHOD

As part of a larger on-going study at an AACSB-accredited, Jesuit Catholic University in the northeast, one year into the pandemic, business students completed an online Qualtrics-administered survey to assess their perceptions on online versus FTF education. The University Internal Review Board and Academic Vice President approved distribution of the survey. The survey was sent to students three times over April 2021 through a list server. The survey was originally sent in 2012 and again in 2018. The survey consisted of 3 major sections: demographic questions, Section A (online education perspective) or Section B (FTF education perspective). Demographic questions included questions on gender, age, class rank (undergraduate – freshmen, sophomore, junior, senior or graduate), undergraduate major or graduate program and potential concentration (graduate), online experience, self-reported level of technological understanding, whether the student was a transfer student, and if the student took an online course, the number of online courses taken. Then students who had completed at least one online course, completed Section A, while students who never took a complete semester online course completed Section B. Section A and B had corresponding questions on the perspectives noted; however, Section A statements are specific to "I found" while section B statements are "I perceive". Specific individual perspectives addressed include motivation, discipline, self-

directed learning and independence, schedule flexibility, time and cost investment, preference, happiness, and appropriateness for the learning environment. Program factors studied include: academic difficulty, academic integrity (cheating), student-to-instructor interaction, student-to-instructor interaction, and program technologies. The student survey can be accessed at: http://www.cambriainstitute.com/journals/j.brcacadjb.2015.04.01.wa04.pdf. Each factor was rated by the respondent using a five-point Likert scale: significant dislike, dislike, okay, like and significantly like. The last questions in Section A and B questioned the respondent on preference for the oppositive environment (to the frame of reference of the questions), the individual's emotional happiness with the environment, and whether the individual felt online courses were appropriate for the University. In Section A, an open-ended question inquiring as to why they chose an online course completed the survey, while Section B ended with an open-ended question as to why the individual did not choose an online course.

ANALYSIS

As shown in Table 1, due to the pandemic, there was a radical shift in students (146) responding to the survey as online participants in 2021 (Section A), while very few FTF students (12) completed the survey as FTF participants (Section B). This change represents a significant change from just 3 years prior (2018).

Table 1: Number of Students Online and FTF in 2012, 2018 & 2021 Surveys.

# of Students	Online	FTF	Total
2012	44	67	111
2018	82	52	134
2021	146	12	158
Total	272	131	403

While the output was discrete with the actual number of responses for each survey for the online instructors and FTF instructors in the Appendix, for contextual understanding of the changes that exist, the student average perceptual responses for 2012, 2018 and 2021 for the online and FTF groups are in Table 2.

Table 2: Student Average Responses –2012, 2018 & 2021 Online versus Face-to-Face.

Factor	2012 Average Response		2018 Average Response		2021 Average Response	
	Online	FTF	Online	FTF	Online	FTF
Motivation	2.34	4.04	2.69	3.81	2.58	4.25
Discipline	3.09	3.39	3.33	3.50	3.66	3.33
Self-directed	2.89	3.97	3.55	3.38	3.14	4.08
Independence	3.52	3.39	3.80	3.22	3.55	3.45
Schedule flexibility	4.20	2.67	4.37	2.48	4.04	2.91
Time investment	2.89	3.38	3.01	3.42	3.47	3.08
Cost investment	2.70	3.48	2.83	3.54	3.02	3.33
Preference opposite	1.64	2.47	1.74	2.08	1.87	2.42
Happiness with environment	3.36	4.21	3.70	3.75	3.24	4
Appropriateness	1.59	1.76	1.22	1.51	1.67	1.67

* p ≤ .05, ** p ≤ .10

Since the survey data was discrete, Chi-Square analysis using the contingency coefficient as the nominal value was performed for the factors. Given the survey setup, online and FTF student responses scales positively viewed the environment that a student was part of. For example, if an online student felt that online was more difficult than FTF, he or she would indicate a significant 'positive' for the online environment. The scale for the FTF students was similar for their environment. Therefore, if the two groups perceive the learning environment differently than their own environment, a significant difference between the two groups would be detected. Essentially, significant differences in comparing survey section A versus survey section B indicates when the two groups view the factor the *same*, while insignificance is associated with a difference in perspective. Analysis for the current 2021 comparison for student

perspectives on individual factors of online and FTF revealed significant differences for motivation (p=.000) and schedule flexibility (p=.000). With respect to motivation, both groups indicated that they were more motivated FTF than online. Both groups felt that online education offered more schedule flexibility than online. Insignificance indicates that the perspectives were different. Therefore, student perspectives on discipline, self-directed, independence, time investment and cost investment, happiness and appropriate were not the same. Online students felt that discipline required was more online, while FTF students were more indifferent with respect to discipline. While online students were indifferent on self-directed, FTF students felt FTF offered more self-direction than online. Each group preferred their respective environment slightly more on independence. Online students felt the online environment required more time, while FTF students were indifferent. While both groups tended to be indifferent on cost investment, FTF students felt the traditional environment tended to cost more. As for students' preference to take courses in the opposite environment, most FTF students (58%) did not want to take an online course, while the majority of online students (65) wanted to take courses FTF. Online students were somewhat indifferent to their happiness online, while FTF students were happy in the FTF environment. Both groups felt online was appropriate at the university, but significantly more online students (55.5%) felt offering online courses was appropriate.

Table 3: Student Individual Perspectives of Online versus FTF 2021.

Factor	Pearson Chi-Square Value	Df	Asymptotic Significance (2-sided)	Pearson's R	Spearman Correlation
Motivation	31.103	4	.000 *	.348	.322
Discipline	5.893	4	.207	-.082	-.081
Self-directed	6.423	4	.170	.180	.180
Independence	4.977	4	.290	-.021	-.052
Schedule flexibility	20.296	4	.000 *	-.242	-.241
Time investment	2.663	4	.616	-.096	-.087
Cost investment	4.143	4	.387	.094	.104
Preference opposite?	4.413	2	.110	.167	.167
Happiness with environment	5.164	4	.271	.147	.142
Appropriateness of Online	.871	2	.647	-.001	.008

* $p \leq .05$, ** $p \leq .10$

In 2018, significant factors as motivation, independence, schedule flexibility, time and cost investment, preference, and appropriateness of online (Fish & Snodgrass, 2020). 2012 results indicated significant factors for motivation, self-directed, independence, schedule flexibility, cost investment, preference, and appropriateness. Slight significance for time investment, but not significant for discipline (Fish & Snodgrass, 2014). Table 4 summarizes the significant individual factors for business students' perspectives on online versus FTF by survey year.

Table 4: Significant Individual Factors Online versus FTF Survey Year

Factor	2012	2018	2021
Motivation	x	x	x
Discipline	y		
Self-directed	x		
Independence	x	x	
Schedule flexibility	x	x	x
Time investment	y	x	
Cost investment	x	x	
Preference opposite?	x	x	
Happiness with environment	x		
Appropriateness of Online	x	x	

(x = significant factor, * $p \leq .05$; y = slight significance, ** $p \leq .10$)

Chi-square analysis between the survey years for the online respondents demonstrated significance for almost all of the factors as shown in Table 5. Since the comparison is *within the same environment*, significance indicates a change

in perspectives from one survey to another. Significance occurred for motivation (p=.020), discipline (p=.006), self-directed (p=.004), time investment (p=.000), cost investment (p=.019), preference for the opposite (p=.007), happiness with the environment (p=.026), and appropriateness of online (p=.001). 2012 respondents were less motivated online than 2018 or 2021 respondents. The average student response on discipline increased from 'indifference' in 2012 toward 'more' discipline' online than FTF by 2021. Student response on self-directed have changed over the survey years as 2012 respondents indicated that online was less self-directed than FTF, 2018 respondents indicating that online was more self-directed, and 2021 respondents being indifferent. Independence and schedule flexibility were not significantly different between the three survey years, as online business students indicated that online offered more independence and schedule flexibility than FTF. Over the survey years, students changed from indicating that the time investment was slightly less for online in 2012 to it required more time investment in 2021. A similar change was noted with respect to cost investment as students in 2012 indicated that online cost slightly less to an indifference between the two environments by 2021. Interestingly, online student preferences to be in the FTF environment, while undecided, on average appear to shift toward 'no' over the three survey years; but in all 3 survey years, the majority indicated that they would like to be in the FTF environment. In 2012, online students were slightly 'happy' online learning, 2018 were 'happy', but 2021 students are not as happy with the online environment. As for appropriateness of online education, 2018 respondents indicated that it was appropriate, while 2012 and 2021 students were undecided.

Table 5: Online Student Perspectives by Survey Year (2012, 2018 & 2021)

Metric	Pearson Chi-Square Value	Df	Asymptotic Significance (2-sided)	Pearson's R	Spearman Correlation
Motivation	18.141	8	.020 *	.051	.016
Discipline	21.326	8	.006 *	.204	.192
Self-directed	22.649	8	.004 *	.010	-.002
Independence	8.066	8	.427	-.024	-.019
Schedule flexibility	11.975	8	.152	-.096	-.066
Time investment	35.276	8	.000 *	.243	.255
Cost investment	18.344	8	.019 *	.158	.165
Preference opposite?	14.022	4	.007 *	.111	.093
Happiness with environment	17.401	8	.026 *	-.087	-.084
Appropriateness of Online	19.243	4	.001 *	.122	.152

$* p \leq .05, ** p \leq .10$

Chi-square analysis between the survey years for the FTF respondents demonstrated very few significant factors as shown in Table 6. Similar to the analysis for online students between the survey years, significance indicates a change in perspective from one survey group to another. Significant differences in perspectives between the survey years for FTF respondents only existed for self-directed (p=.002) with a slight significance for preference (p=.053). 2018 students were relatively indifferent to the self-directed nature of FTF, while 2012 and 2021 FTF students felt FTF offered a more self-directed environment than online. 2012 and 2021 FTF students do not prefer to be online, while 2018 FTF students were undecided. In all three years, FTF students are more motivated FTF, and felt FTF required more discipline and offered more independence than online. Additionally, all three FTF groups realized that online offered slightly more schedule flexibility than FTF. All three FTF groups indicated that FTF required more time and cost investment than online, and are happy in the FTF environment. In all three survey years, most FTF students felt online was appropriate.

Table 6: FTF Student Perspectives by Survey Year (2012, 2018 & 2021)

Metric	Pearson Chi-Square Value	Df	Asymptotic Significance (2-sided)	Pearson's R	Spearman Correlation
Motivation	10.781	8	.214	-.021	-.022
Discipline	2.105	8	.978	.017	.022
Self-directed	24.444	8	.002 *	-.132	-.143
Independence	5.253	8	.730	-.039	-.048
Schedule flexibility	4.989	8	.759	-.005	-.024
Time investment	9.567	8	.297	-.053	0.037
Cost investment	5.523	8	.701	-.018	-.010
Preference opposite?	9.360	4	.053 **	-.143	-.159
Happiness with environment	9.910	8	.271	-.190	-.205
Appropriateness of Online	5.284	4	.259	-.112	-.143

$* \ p \leq .05, ** \ p \leq .10$

DISCUSSION

This focus of the long-term study addresses whether business students' perspectives of online and FTF education differ. In the analysis given the directions for the Likert-scale responses of sections A and B, when an individual factor is significant, the online and FTF students have the *same* perspective if the factor is significant. The 2021 business student responses indicate that the online and FTF students are similar on just two factors – motivation and schedule flexibility. All of the other factors were not significant and favor differing perspectives. The current online and FTF business students differ in their perspectives of the individual factors of discipline, self-directed, independence, time investment, cost investment, preference, happiness and appropriateness.

Respective to the main focus of this paper, the question of whether the online and FTF student perspectives have changed from the original study (2012; Fish & Snodgrass, 2014) or a more recent one prior to the pandemic (2018; Fish & Snodgrass, 2020). Prior to the pandemic, there were very few changes in the students' perspectives as demonstrated by Table 4. One year into the pandemic, the number of students taking online courses due to the pandemic more than tripled the original 2012 number. As noted here, online business student perspectives have changed significantly over time for the individual factors of motivation, discipline, self-directed, time investment, cost investment, preference, happiness and appropriateness. While the perspectives have changed, changes do not necessarily favor online as the preferred educational environment by students. Changes may be attributed to being forced online due to the pandemic – which was not necessarily a choice as most classes remained online well into the pandemic. Only a handful of students were able to take all of their classes as FTF in the fall of 2020 and spring of 2021, and therefore, they avoided taking online classes. The question going forward will be how many remain by choice in online and how many students take most of their classes FTF.

Contrastingly, FTF business student perspectives have not changed significantly over the three survey years for most individual factors. The FTF business students remained steadfast in their perspectives as the only individual factor that was significantly different across the survey years was self-directed. Students who have not taken an online course remain homogenous in their perspectives.

The main purpose of this paper is to note the changes that have occurred in individual factors due to the pandemic. As we've noted, these factors mainly changed for online students. Focusing on these changes, we note the following:

Student Motivation, Discipline, Self-directed Learning and Independence. The results here demonstrate that student perspectives on motivation changed over the survey years for online students who are more motivated online today than in 2012; however, today's online students are close to being indifferent to the two environments on motivation, neither favoring a decrease in motivation (Carr, 2000; Lei & Gupta, 2010; Maltby & Whittle, 2000) or an increase in motivation online over FTF (Kearsley, 1996; Larson & Sung, 2009). Online students also exhibited a significant change on discipline from relatively being indifferent in 2012 toward more discipline online than FTF during the pandemic, which is in support of prior research (Jacob & Radhai, 2016; Tratnik et al. 2019). With respect to self-directed learning, all three surveys favor different environments, with today's online business students being

indifferent to the self-directed learning, which contrasts more recent studies that indicated online courses require more self-directed learning (Kirtman, 2009; Weldy, 2018). Note that this study occurred prior to the pandemic, which may be a significant factor in the difference between the two studies. Interestingly, the only significant factor across the surveys for the FTF students was self-directed. The 2012 and 2021 FTF students indicated that the FTF environment offered more self-direction, while the 2018 FTF students were indifferent. As for independence, it was not significantly different across the surveys and responses were similar to other studies (Smart & Cappel, 2006; Hiltz & Turoff, 2005) as online business students favored online as offering more independence than FTF.

Schedule Flexibility. As in other studies, these results resoundingly support students' perspectives on schedule flexibility as supporting online as offering significantly more schedule flexibility than FTF. As noted previously, schedule flexibility is often noted as a driving factor as to why students choose online classes (Dobbs et al., 2017; Kirtman, 2009; Mather & Sarkans, 2018; Nguyen, 2015; Platt et al., 2014; Xu & Jaggers, 2013). Online business students' perspectives on this factor have not changed over the three study years.

Time and Cost Investment. Online students' perceptions of time investment changed over the years as students changed from indicating time investment was less for online than FTF in 2012 to indicating that online required more in 2021. The shift toward online requiring more time supports several prior studies (Dobbs et al., 2009; Lovern & Lovern, 2013; Perreault et al, 2008). Results also support a shift in online students' perception on cost investment as 2012 students perceived online to cost less than FTF, but 2021 students perceived the two environments with indifference. Cost investment is often noted as a driver toward online courses (Nguyen, 2015, Smith et al, 2019), but today's online business students did not perceive this difference. FTF business students' perspectives on cost investment, which did not change over the survey years, favored FTF as costing more.

Preference. Online business students, while preferring FTF, appear to be shifting toward online over the three surveys. While preference for FTF business students appeared to be shifting from 2012 to 2018 (Fish & Snodgrass, 2020), today's FTF students prefer to be in the FTF environment and no significant difference in perspectives were note for the FTF business students. These results **currently** support prior studies where students preferred FTF (Lee et al., 2017; Pointer et al, 2019; Tratnik et al., 2019).

Happiness. Online business students are not as happy with online as the 2018 online respondents. While not significantly different across the survey years, FTF business students in 2018 were not as happy on average as 2012 or 2021. These results are in support of some research where students are happier in the FTF environment (Mullen & Tallent-Runnels 2006), and contrast other studies where students indicated a higher satisfaction for online learning (Gratton-Lavoie & Stanley, 2009; Harmon et al., 2014; Means et al., 2010).

Appropriateness. Interestingly, today's online students are not as assured of the appropriateness of online education as their 2018 counterparts as a significant change occurred in appropriateness. Proportionally, more online students were undecided or said 'no' to the appropriateness of online versus prior years. Perhaps many online students felt that they had to take online courses due to the pandemic and are not as assured that online is appropriate for them in the future.

While our prior research for this population demonstrated few individual factors changed in their significance over the six years between surveys, the results here one year into the pandemic demonstrate significant changes for online business students on most individual factors. The current findings are similar to researchers who found that student perceptions to online education have changed over time (e.g. Allen & Seaman, 2013; Benbunan-Fich & Hiltz, 2003; Perreault et al., 2008; Tanner et al., 2003; Tanner et al., 2004a, 2004b; Tanner et al., 2006; Tanner et al., 2009) and support the concept that student perceptions can change over time. Interestingly, FTF business students remain steadfast in their perspectives of online versus FTF for most individual factors over the three survey years. As technology and educational changes continue, and the pandemic subsides, future studies may report common perceptions between online and FTF students on all individual factors for both online and FTF students.

CONCLUSIONS

One year into the pandemic where many students were forced to move to online education to continue their education, changes in business students' perspectives of online and FTF education for individual factors of motivation, discipline, self-directed, time investment, cost investment, preference, happiness and appropriateness versus the original study (2012) and prior to the pandemic (2018). FTF student perspectives of online and FTF education only changed for one

individual factor (self-directed) from the two prior survey years. Therefore, these results support the changes in online perspectives that are occurring as technology and online instruction changes. As for the FTF group, their perspectives have only become more steadfast over the survey years, as students self-select their education and work to take FTF courses in light of the pandemic.

As higher education continues to transition to more online education in the classroom, instructors and administrators need to understand and carefully manage student expectations and perceptions. Administrators may consider offering surveys to test student's readiness for online education or additional preparation courses may be offered for students taking online courses. Online students need to understand the expectations of online education, and instructors need to clear express these expectations in the course syllabus and comments. As for FTF classes, technology will continue to seep into regular instruction, and if the pandemic continues, many courses may transition online, leaving fewer FTF courses for students to choose from. Administrators need to provide clear information regarding the differences in expectations for online components in FTF classes and provide online learning tools and support.

Clearly, the pandemic has demonstrated that online learning is not for everyone. Administrators need to support both environments going forward. Instructors need to understand the differences in student expectations between the two environments and be clear with course expectations regardless of which environment the course exists in. Regardless of whether a student is FTF or online, communication between the instructor, administration and the students is key to properly setting expectations – and shaping perceptions.

As noted in our prior studies, the context of the study may be a critical factor to consider in understanding student activity preferences. This study occurred at a teaching institution that focuses on educating the whole person mainly in traditional FTF education. Prior to the pandemic, online education occurred through decisions entirely made by the individual instructor as no instructional designers are available. The pandemic required most courses to transition to online for the safety of the instructor and students. Following the pandemic, it will be interesting to note the number of students requesting online courses versus FTF as well as any changes in student perspectives.

Limitation. In 2021, very few 'pure' FTF students (12) that had never taken a full semester online course remained due to the pandemic. However, the 2021 FTF student results were similar to the two prior surveys as a shift only occurred on one factor.

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Web Appendix: A web appendix for this paper is available at:
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Appendix

2021 Student Results Online & FTF Responses

Factor	Average Response		Online Response					Face-To-Face Response				
	OL	FTF	1	2	3	4	5	1	2	3	4	5
Motivation	2.58	4.25	35	34	45	21	11	0	0	4	1	7
Discipline	3.66	3.33	4	16	44	43	39	0	4	2	4	2
Self-directed	3.14	4.08	26	24	32	32	32	0	1	3	2	6
Independence	3.55	3.45	13	17	31	46	39	0	1	5	4	1
Schedule flexibility	4.04	2.91	10	6	17	48	65	1	4	2	3	1
Time investment	3.47	3.08	6	18	50	46	26	1	3	3	4	1
Cost investment	3.02	3.33	8	18	93	17	10	1	1	5	3	2
Preference opposite?	1.87	2.42	65	35	46			2	3	7		
Happiness	3.24	4.00	22	30	37	35	32	0	0	3	5	3
Appropriateness OL	1.67	1.67	81	32	33			6	4	2		

Online Students Responses by Year

Factor	2012					2018					2021				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Motivation	10	11	21	2	0	10	22	33	15	1	35	34	45	21	11
Discipline	5	9	10	17	3	4	11	30	28	9	4	16	44	43	39
Self-directed	4	12	16	9	3	4	10	22	29	17	26	24	32	32	32
Independence	2	7	9	18	8	3	6	16	36	21	13	17	31	46	39
Schedule flexibility	0	3	5	16	20	1	0	8	32	41	10	6	17	48	65
Time investment	2	14	15	13	0	4	12	48	15	3	6	18	50	46	26
Cost investment	1	14	26	3	0	3	18	51	10	0	8	18	93	17	10
Preference opposite?	21	18	5			35	33	14			65	35	46		
Happiness	3	3	19	13	6	3	6	24	29	20	22	20	38	35	32
Appropriateness OL	26	10	8			67	12	3			81	32	33		

FTF Students Responses by Year

Factor	2012					2018					2021				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Motivation	0	2	15	28	22	1	5	13	17	16	0	0	4	1	7
Discipline	1	17	16	21	12	0	11	14	17	10	0	4	2	4	2
Self-directed	0	2	11	41	13	3	9	13	19	8	0	1	3	2	6
Independence	0	9	26	29	3	2	10	17	19	3	0	1	5	4	1
Schedule flexibility	7	28	15	14	3	9	19	11	11	0	1	4	2	3	4
Time investment	1	8	24	31	2	1	7	20	17	7	1	3	3	4	1
Cost investment	1	7	23	29	6	1	5	20	17	6	1	1	5	3	2
Preference	6	23	37			15	16	19			2	3	7		
Happiness	0	0	12	29	26	2	1	17	19	12	0	0	3	5	3
Appropriateness OL	28	27	12			32	12	7			6	4	2		

Changing Business Student Perceptions of Program Factors in Online versus Face-to-Face Education During the Pandemic

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ABSTRACT

As part of an ongoing study of student perceptions of online versus face-to-face education, business students at an AACSB Jesuit, Catholic University were surveyed in 2012, 2018 and 2021. With changing technology and educational improvements, student perceptions may change over time. While perceptual changes in program factors since 2012 were not detected in 2018, with the increase in students taking online classes due to the pandemic, this study evaluates the changes in student perceptions on the program factors of difficulty, cheating, student-to-student interaction and student-to-instructor interaction during the pandemic. Results have implications for instructors and administrators.
Keywords: Student Perceptual Changes, Program Factors, Online, Face-to-Face

INTRODUCTION

Student perceptions of online learning and course structure are fundamental to student satisfaction (Beach, 2018; Blau et al., 2017; Eom & Ashill, 2016; Gering et al., 2018). Often, administrators believe FTF and online education are equivalent (Allen & Seamen, 2013). However, research on student perceptions of online and face-to-face (FTF) education indicates their perceptions are not always equivalent and does not always support this assumption (e.g. Baker & Unni, 2018; Barnes, 2017; Allen & Seamen, 2013, Fish & Snodgrass, 2014, 2020a, 2020b; Guest et al., 2018; Kuzma, et al., 2015; Perreault et al., 2008; Tanner et al., 2009; Tratnik et al., 2019). In keeping with other studies (Platt, et al., 2014), results from two survey years at the University studied in this paper demonstrated that students preferred FTF education over online for most factors (Fish & Snodgrass, 2014, 2020a, 2020b). As someone is exposed to and uses a particular technology or method, the more adept they become (Dobbs et al., 2009; Tekinarslan, 2011). As technology evolves, student perceptions will continue to evolve (Richardson, et al., 2016), and student perceptions to online education may change over time (e.g. Allen & Seaman, 2013; Benbunan-Fich & Hiltz, 2003; Perreault et al., 2008; Tanner et al., 2009). These studies occurred prior to the pandemic that forced most higher education to move online for most courses, and therefore, students' perceptions may have changed.

The original study of business students at the University demonstrated that the students clearly preferred FTF education over online for the majority of factors studied; however, the initial study also noted that as the number of courses that students take increases, their acceptance of online education appeared to improve (Fish & Snodgrass, 2014). To evaluate the potential changes in student perceptions over time, the same survey as 2012 was redistributed at the University in 2018. Results demonstrated a shift in a few, but not all, of the factors studied (Fish & Snodgrass, 2020a, 2020b). These studies occurred *prior to the pandemic,* and most comparisons occurred from the FTF perspective. As the pandemic began, University courses moved mid-semester from FTF to online. Students and instructors were forced to complete the courses in a new modality – with the original FTF goals and objectives. Clearly, these were not true 'online courses.' Existing FTF courses cannot merely transition online; the course needs to keep FTF elements while also building on online activities (Means et al., 2013). Differences between online and FTF modalities include pedagogical aspects such as teaching fundamentals, developing a relationship with students, providing stimulating content, and timely feedback (Brocato et al., 2015). In the following semesters with the pandemic continuing, most courses shifted to online courses and students were often forced to take online courses whether they wished to or not. However, the University was able to offer a few FTF classes starting in the fall 2020. Therefore, a few instructors and students have not experienced a specifically-designed online semester course.

Following the pandemic, higher education will look very different than prior. Understanding instructors' and students' perspectives and their differences may guide future online pedagogy, instructional strategy and technology integration to support online learning (Redman & Perry, 2020). As part of a larger study, one full year into the pandemic (April 2021), instructors and students were surveyed again on their perspectives. Literature streams concentrate on demographic differences, individual factors and program factors (Fish & Snodgrass, 2014). Program factors, which are decisions that the instructor makes in developing the course, studied include academic difficulty, academic integrity (cheating), student-to-instructor interaction, and student-to-instructor interaction. (Course technologies are another important aspect to program factors, but the results are not reviewed here.) Differences over the six years

from the original survey (2012) to the next survey (2018) did not reveal any statistically significant changes for the online students; however, FTF students changed their perspective on student-to-instructor interaction. FTF students were not as positive about their relationship with instructors in 2018 as they were in 2012. The pandemic and associated response by higher education to online instruction may result in courses and classrooms that look very different in the future compared with before the pandemic; however, some recognize that online teaching may never fully replace FTF learning (Radcliffe et al., 2020). This study offers insight into changes in student perspectives on program factors from prior to the pandemic (2012 and 2018) to during the pandemic. The question for this study is: *Have students' – those that have taken and those that have not taken an online course – perspectives of online education compared to face-to-face (FTF) education with respect to program factors changed from 2012 and 2018 to 2021?* The pandemic has altered nearly every aspect of our lives. Therefore, the question before educators is '*what will education 'look like' in the future?* Instructor and student perspectives will shape the answer to this question.

REVIEW OF THE LITERATURE: PROGRAM FACTORS UPDATE

Students' perceptions of the online learning environment and course structure are fundamental to student satisfaction (Beach, 2018; Blau et al., 2017; Eom & Ashill, 2016; Chawla & Joshi, 2012; Gering et al., 2018), and our purpose here is to highlight recent research on student perspectives on the program factors. (This literature review is not intended to be a comprehensive review of students' perspectives. Interested readers, a deeper literature review on these factors can be found at Fish & Snodgrass (2014 2020a, 2020b).)

Difficulty. Student perceptions on academic difficulty vary, with some studies finding FTF courses easier than online (Dobbs et al, 2009; Asunka, 2008), while other finding online courses easier than FTF (Armstrong, 2011). As the pandemic started and courses transitioned to online learning, one study noted that a focus on pedagogy should be prioritized over a focus on the technology (Peimani & Kamalipour, 2021). Online learning can be effective for students who are motivated, self-disciplined, organized and have good time- management skills (Jacob & Radhai, 2016), but can be less effective for students who lack appropriate technology or where there are reduced interactions between students and instructors (Charkraborty & Nafukho, 2014). Students viewed workload online as more manageable than FTF (Mather & Sarkans, 2018). Quantitative courses may be more difficult online due to a lack of communication, time delays, a lack of student-to-student interaction and a need for higher levels of computer literacy as well as technical problems (Stankous & Buibas, 2018). In the original survey, difficulty was significant at the 10% level as online and FTF students tended to agree that online courses were easier than FTF (Fish & Snodgrass, 2014). By 2018, difficulty was a significant factor, indicating that the online and FTF perspectives were similar and favored online as being easier (Fish & Snodgrass, 2020a). Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of difficulty online versus FTF changed?*

Student-to-Student Interaction. Some past research indicates that students perceive FTF courses as offering more student-to-student interaction than online (Charkraborty & Nafukho, 2014; Chen et al., 2013; Spencer & Temple, 2021; Tichavsky et al., 2015). Students enrolled in online courses are often less engaged in collaborative learning, student-faculty communication and discussion with their peers than their counterparts in FTF courses (Dumford & Miller, 2018). Online courses are less likely to offer students the opportunity to engage with their peers and develop close associations with each other (Dumford & Miller, 2018, Smyth et al., 2012). However, previous exposure to online classes was positively associated with perceptions of comparative level of interaction in online versus face-to-face classes (Platt et al., 2014). Student-to-student interaction may be supported by faculty communicating expectations for student behavior, modeling dialogue and collaborative interaction, and ensuring accountability through individual student assessment for group activities (Crawford-Ferre & Wiest, 2012). Social presence and online learning satisfaction are positively related (Martin & Bolliger, 2018). Online students noted that online discussion forums involved responding to initial questions posed by the faculty as their main method of interaction with the instructor and other students in the course (Mather & Sarkans, 2018). Online students report meeting less with their peers and forming fewer study groups than FTF students (Horspool & Lange, 2012). Online students were more negative to group work than students in FTF sections (Smith et al., 2011) as online groups may pose unique challenges and frustration due to poor communication among group members and difficulty in working with virtual group members (Mather & Sarkans, 2018). FTF students indicated that in-class discussion and faculty expertise, along with immediate feedback from the faculty and other students were important to their interaction (Mather & Sarkans, 2018). In both of the prior studies, online and FTF students felt the student-to-student interaction was more FTF than online (Fish & Snodgrass, 2014, 2020a). Therefore, we pose the following research question: *Given the significant increase*

in the number of students taking courses online due to the pandemic, have business students' perceptions of student-to-student interaction online versus FTF changed?

Student-to-Instructor Interaction. As for student-to-instructor interaction, research on student perceptions has found mixed results. Some past research indicates that students perceive FTF courses as offering more student-to-instructor interaction than online (Dumford & Miller, 2018; Fish & Snodgrass, 2014; Garrison & Vaughan, 2008; Mather & Sarkans, 2018; Pointer et al., 2019; Smith et al., 2019; Spencer & Temple, 2021; Wang & Morgan, 2008; Wuensch et al.,2008). However, other studies indicate that online students prefer they receive more response from the instructors in the online mode (Boyd, 2008; Lee et al., 2017; Mortagy & Boghikian-Whitby, 2010). Still, others found indifference between the two environments (Horspool & Lange, 2012).

FTF students who are not satisfied with the interactions occurring in the FTF classroom are more likely to take online courses as they do not see the usefulness of interactions with the instructor or students in the classroom (Lee et al., 2017). Often, online learners do not seek a personal connection with the instructor (Preisman, 2014). However, the low level of teacher's presence online (Xu & Jaggars, 2013) can be mitigated by synchronous sessions (Smith et al., 2019). According to students, one of the most important components of a successful online course is having an instructor that is flexible, supportive, and communicates frequently (Beach, 2018). In another study, students' overall perspectives of online courses were positive as they felt instructional technologies facilitated prompt feedback and positively viewed their instructor's skill level and technology use (Spencer & Temple, 2021). Yet another study found that online students were unhappy with the lack of communication and feedback from the instructors and they felt the instructor was disengaged and participated minimally (Mather & Sarkans, 2018). Interestingly, online instructors typically receive lower instructor performance ratings from students for their teaching (Brocato et al., 2015).

In another study, the majority of FTF students choose FTF as their preferred method of learning as they felt it emphasized faculty expertise and knowledge, which they indicated was the main contributing factor to their learning (Mather & Sarkans, 2018). FTF students praised their instructors for clarity of instruction, variety of instructional strategies and genuine interest in student learning (Mather & Sarkans, 2018). Business students more likely to register for FTF classes due to lack of communication between students and instructors (Smith et al., 2019). In both of the prior surveys, online and FTF students perceived the FTF classroom as offering more student-to-instructor interaction (Fish & Snodgrass, 2014; 2020a). Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of student-to-instructor interaction online versus FTF changed?*

Academic Integrity (Cheating). Research on student perceptions indicates that students feel that it's easier to cheat online (King et al., 2009; Pointer et al., 2019). Online courses have more opportunities for cheating due to the inherent nature associated with course design and technology used to deliver course content in comparison to FTF (Lanier, 2006; Moten et al, 2013; Stack, 2015; Tsai, 2016). However, while most students felt that cheating occurred in the online environment, the majority of students were less knowledgeable of cheating incidents (Pointer et al., 2019). Another study found that there were no significant differences in students admitting to various forms of cheating between online and FTF students (Watson & Sottile, 2010). While one study found online cheating to be more prevalent than FTF (Fontaine, 2012), another student found students tend to engage less in cheating online than FTF (Peled et al., 2019). Cheating practices in online classes consisted of waiting for answers, reporting fraudulent error messages, collaboration with peers, plagiarism by not citing the work of others and purchasing answers (Moten et al, 2013). In both of our studies, cheating was significant as online and FTF students felt that cheating was easier online than FTF (Fish & Snodgrass, 2014, 2020a). Therefore, we pose the following research question: *Given the significant increase in the number of students taking courses online due to the pandemic, have business students' perceptions of cheating online versus FTF changed?*

Salient Conclusions for Our Study. This literature review is not intended to be a comprehensive review of the research on student program factors, but rather an updating of the status. The ambiguity and 'mixed' results on several factors from our prior studies remain. Additionally, most of these studies occurred prior to the pandemic when many students had not experienced online education. The pandemic changed this perspective. Since the original study, available technologies and instructor methods to teach online have changed. In light of the change to significantly more students experiencing online education, have student perceptions on program factors changed? It's important to note that survey was performed over a year into the pandemic, and therefore, students had time to adjust to online education. As we have proposed previously (Fish & Snodgrass, 2014), the study's context may be an important factor to consider. We intend to address the questions developed above as the basic question regarding the current status of

students' perspectives on online versus FTF education at this University. Specifically, our Research Questions addressed within this paper are:

#1) Do online and FTF students' perspectives for program factors of online versus Face-to-Face education on program factors differ?

    H_{10}:   Business students' perspectives for program factors of online education are *the same* as their perspectives of FTF education.

    H_{11}:   Business students' perspectives for program factors of online education are *not equal* to their perspectives of FTF education.

#2) Have online students' perspectives for program factors of online versus Face-to-Face education changed from 2018? 2012?

    H_{20}:   Online business students' perspectives for program factors of online education are *the same* as their perspectives of FTF education as in 2012 and 2018.

    H_{21}:   Online business students' perspectives for program factors of online education are *not equal* to their perspectives of FTF education as in 2012 and 2018.

#3) Have FTF students' perspectives for program factors of online versus Face-to-Face education changed from 2018? 2012?

    H_{30}:   FTF business students' perspectives for program factors of FTF education are *the same* as their perspectives of online education as in 2012 and 2018.

    H_{31}:   FTF business students' perspectives for program factors of FTF education are *not equal* to their perspectives of online education as in 2012 and 2018.

With the significant change to online education due to the pandemic, we are addressing the basic question "*have business students' perceptions changed?*"

METHOD

One year into the pandemic, as part of a larger on-going study at an AACSB-accredited, Jesuit Catholic University in the northeast, business students completed an online Qualtrics-administered survey to assess their perceptions on online versus FTF education. The University Internal Review Board and Academic Vice President approved distribution of the survey. The survey was sent to students three times over April 2021 through a list server. The survey was originally sent in 2012 and again in 2018. The survey consisted of 3 major sections: demographic questions, Section A (online education perspective) or Section B (FTF education perspective). Demographic questions included questions on gender, age, class rank (undergraduate – freshmen, sophomore, junior, senior or graduate), undergraduate major or graduate program and potential concentration (graduate), online experience, self-reported level of technological understanding, whether the student was a transfer student, and if the student took an online course, the number of online courses taken. Then students who had completed at least one online course, completed Section A, while students who never took a complete semester online course completed Section B. Section A and B had corresponding questions on the perspectives noted; however, Section A statements are specific to "I found" while section B statements are "I perceive". Specific individual perspectives addressed include motivation, discipline, self-directed learning and independence, schedule flexibility, time and cost investment, preference, happiness, and appropriateness for the learning environment. Program factors studied include: academic difficulty, academic integrity (cheating), student-to-instructor interaction, student-to-instructor interaction, and program technologies. The student survey can be accessed at: http://www.cambriainstitute.com/journals/j.brcacadjb.2015.04.01.wa04.pdf (Fish & Snodgrass, 2020b). Each factor was rated by the respondent using a five-point Likert scale: significant dislike, dislike, okay, like and significantly like. The last questions in Section A and B questioned the respondent on preference for the oppositive environment (to the frame of reference of the questions), the individual's emotional happiness with the environment, and whether the individual felt online courses were appropriate for the University. In Section A, an open-ended question inquiring as to why the student chose an online course completed the survey, while Section B ended with an open-ended question as to why the individual did not choose an online course.

ANALYSIS

Our research focus here lies in uncovering changes since our original study (2012) and the follow-up study prior to the pandemic (2018) in business student perceptions of online versus FTF education for the program factors of

difficulty, cheating, student-to-student interaction, and student-to-instructor interaction. Theoretically, students should perceive the environments equally.

As shown in Table 1, the number of students who have taken at least one course (completed survey section A) increased significantly during the pandemic (146). The number of students who reported never taking an online course and remaining as FTF students (completed survey section B) dropped significantly (12). (Note, the University offered FTF courses throughout the 2020-2021 academic year; however, most courses – including required business courses – were online.)

Table 1: Number of Students Online and FTF in 2012, 2018 & 2021 Surveys

# of Students	Online	FTF	Total
2012	44	67	111
2018	82	52	134
2021	146	12	158
Total	272	131	403

While the output was discrete with the actual number of responses for each survey for the online and FTF students in the Appendix, for contextual understanding of the changes that exist, the average student perceptual responses for 2012, 2018 and 2021 for the online and FTF groups are in Table 2.

Table 2: Student Average Responses –2012, 2018 & 2021 Online versus Face-to-Face

Factor	2012		2018		2021	
	Online	FTF	Online	FTF	Online	FTF
Difficulty	2.43	2.69	2.57	2.94	2.99	2.17
Student-to-Student Interaction	2.45	3.93	2.59	3.92	2.39	4.25
Student-to-Instructor Interaction	2.64	4.22	2.62	3.96	2.49	4.5
Cheat	2.61	4.40	2.34	3.87	2.44	4.25

Since the survey data was discrete, Chi-Square analysis using the contingency coefficient as the nominal value was performed for the factors. Given the survey setup, online and FTF student responses scales positively viewed the environment that a student participated in. For example, if an OL student felt that OL was more difficult than FTF, the student indicated a significant 'positive' for the OL environment. The scale for the FTF students was similar for their environment. Therefore, if the two groups perceived the learning environment differently than their own environment, a significant difference between the two groups existed. Essentially, significant differences in comparing survey section A versus survey section B indicates when the two groups view the factor the *same*, while insignificance is associated with a difference in perspective. As shown in Table 3, in 2021 students' perceptions of OL and FTF were significantly different for student-to-student interaction (p=.000), student-to-instructor interaction (p=.000) and cheating (p=.000). Online and FTF students perceived the FTF environment to offer more student-to-student interaction and student-to-instructor interaction. Both groups also felt that it was more difficult to cheat in the FTF environment than online. With respect to difficulty, which was not significant, online students were indifferent to the environments, but FTF students felt that FTF courses were significantly more difficult than online courses.

Table 3: Chi-Square Analysis Student Program Factors Perspectives of Online versus FTF 2021

Factor	Pearson Chi-Square Value	Df	Asymptotic Significance (2-sided)	Pearson's R	Spearman Correlation
Difficulty	7.185	4	.126	-.201	-.203
Student-to-Student Interaction	30.411	4	.000 *	.395	.361
Student-to-Instructor Interact	39.569	4	.000 *	.424	.384
Cheat	65.714	4	.000 *	.495	.421

* p ≤ .05, ** p ≤ .10

In the original study (2012), student-to-student interaction, student-to-instructor interaction and cheating were all significantly different between online and FTF students (Fish & Snodgrass, 2014). Difficulty was slightly significant ($p \leq .10$). In 2018, all of the program factors were significantly different between the online and FTF students, which indicated the groups felt similarly about the environments (Fish & Snodgrass, 2020a). Table 4 summarizes the significant program factors for business students' perspectives on online versus FTF by survey year. Students' perspectives of difficulty between the online and FTF groups have remained significant for student-to-student interaction, student-to-instructor interaction and cheating. However, difficulty has changed over the three survey years. From the average response, online students are trending toward indifference between the two environments, while FTF students indicated that FTF was slightly easier than online in 2012, but showed indifference in 2018, and currently indicate that FTF courses are easier than online.

Table 4: Significant Program Factors Online versus FTF Survey Year

Factor	2012	2018	2021
Difficulty	y	x	
Student-to-Student Interaction	x	x	x
Student-to-Instructor Interaction	x	x	x
Cheat	x	x	x

(x = significant factor, * $p \leq .05$; y = slight significance, ** $p \leq .10$)

Chi-square analysis between the survey years for the online respondents demonstrated significance for almost all of the factors as shown in Table 5. Since the comparison is *within the same environment*, significance indicates a change in perspectives from one survey to another. Online students have significantly changed their perspectives of online versus FTF for difficulty ($p=.003$), student-to-student interaction ($p=.008$), and student-to-instructor interaction ($p=.000$). Cheating was not significantly different over the survey years. As noted previously, with respect to difficulty, online student perspectives are trending toward indifference between the two environments. While online students perceive the student-to-student interaction to be less online than FTF, students in 2018 were more indifferent on average than 2021 students. With respect to student-to-instructor interaction, online students are trending toward liking the interaction less online than in prior years. As for cheating, online students continue to perceive that it's easier to cheat online easier than FTF.

Table 5: Chi-Square Analysis Program Factors Student Perceptions Online vs Survey Year

Metric	Pearson Chi-Square Value	Df	Asymptotic Significance (2-sided)	Pearson's R	Spearman Correlation
Difficulty	23.043	8	.003 *	.226	.231
Student-to-Student Interaction	20.639	8	.008 *	-.093	-.113
Student-to-Instructor Interact	28.384	8	.000 *	-.053	-.081
Cheat	7.882	8	.445	.013	.028

* $p \leq .05$, ** $p \leq .10$

Chi-square analysis between the survey years for the FTF respondents revealed only one significant factor as shown in Table 6. Similar to the analysis for online students between the survey years, significance indicates a change in perspective from one survey group to another. In the 2018 survey, FTF students appeared to be 'less' positive toward the student-to-instructor interaction than in 2012; however, in the 2021 survey, FTF students are very positive toward the traditional student-to-instructor interaction in the FTF classroom. As for difficulty, FTF students perceive that FTF courses are easier than online, prefer the student-to-student interaction in a FTF course more than online, and perceive that it would be harder to cheat FTF than online.

Table 6: Chi-Square Analysis Program Factors Student Perceptions FTF vs Survey Year

Metric	Pearson Chi-Square Value	Df	Asymptotic Significance (2-sided)	Pearson's R	Spearman Correlation
Difficulty	11.381	8	.181	-.038	.008
Student-to-Student Interaction	8.319	8	.403	-.079	-.088
Student-to-Instructor Interact	13.727	6	.033 *	-.110	-.142
Cheat	4.477	8	.812	.059	.054

* p ≤ .05, ** p ≤ .10

DISCUSSION

In spite of significantly more students responding as online students, the 2021 survey results mirror the prior results on program factors with the exception of difficulty. Students' perspective on difficulty has changed in significance over the years, and the current results indicate that online and FTF students differ in their perspectives on this factor. While online students perceive the two environments equally on difficulty, FTF students perceive FTF to be easier than online.

As for changes that are occurring in student perspectives, the online students perceive difficulty, student-to-student interaction and student-to-instructor interaction differently than prior years. Hence, online business students' perceptions are changing on these factors. The pandemic increased the number of students taking online classes, and many online students perceive that the interaction in the traditional FTF classroom is higher than online. Interestingly, online students perceive the difficulty of the two environments to be the same versus prior years where online students viewed online as easier than FTF. All three of the program factors (difficulty, student-to-student interaction, and student-to-instructor interaction) are related to decisions that instructors make in designing and managing their online courses. Essentially, instructors have managed to bridge the gap between FTF and online in difficulty, but have not mirrored the interaction in the FTF environment. Interesting, online and FTF business student perspectives of cheating have not waned over the three survey years as both groups perceive it to be easier to cheat online.

With respect to the few remaining FTF students, their perceptions of most program factors have not changed. Specifically, their views on difficulty, student-to-student interaction and cheating remain relatively constant over the three surveys. Their views of student-to-instructor interaction have changed over the survey years. From 2012 to 2018, FTF students were less favorable to the interaction with instructors in the traditional classroom (Fish & Snodgrass, 2020a). They significantly changed their perception of the interaction with instructors as the 2021 response to this factor overwhelming supported significantly more interaction in the FTF classroom. Obviously, while these students have never taken a fully-designed online semester course, they were introduced to online at the onset of the pandemic. Perhaps this introduction solidified their perceptions of the positive interaction with instructors in the traditional environment.

Prior to the pandemic, a second survey did not reveal significant changes in student perceptions of online versus FTF for program factors (Fish & Snodgrass, 2020). At that time, the only factor that changed significantly was the FTF students' perception of student-to-instructor interaction, which was less positive toward FTF interaction than the 2012 study. During the pandemic, with significantly more students experiencing online education, significant changes in students' perceptions occurred in support of prior research (e.g. Allen & Seaman, 2013; Benbunan-Fich & Hiltz, 2003; Perreault et al., 2008; Tanner et al., 2009) and supports the concept that student perceptions can change over time. Undoubtably, many online students participating in the survey may have been forced by the pandemic to take online courses instead of 'choosing' to take them as prior to the pandemic. It is interesting to note that the few FTF students remaining mirror prior FTF populations on most program factors, as well as the fact that they are more positive to the student-to-instructor interaction in the traditional classroom.

The main purpose of this paper is to note the changes that have occurred in program factors due to the pandemic. As we've noted, these factors mainly changed for online students. Focusing on these changes, we note the following:

Difficulty. In designing and managing online courses, instructors indirectly or directly impact on the difficulty of the course whether its online or FTF. For this population, the remaining FTF students view FTF classes as easier than online in support of some prior studies (Dobbs et al., 2009; Asunka, 2008), while online students are indifferent.

Online students' perceptions of difficulty have changed over the three survey years, but FTF students' perceptions have not. The online students' perception that the two environments are indifferent speaks to the instructors designing and developing online courses that match the difficulty to the FTF classroom.

Student-to-Student Interaction.   Online and FTF students at this University perceive FTF courses as offering more student-to-student interaction than online, in support of prior research (Charkraborty & Nafukho, 2014; Chen et al., 2013; Smith et al., 2011; Spencer & Temple, 2021; Tichavsky et al., 2015). However, online students' perspective for this factor has changed over the three survey years as they are more positive to the FTF environment than in 2018. FTF students have not changed their perspective on this factor as they significantly favor FTF interaction with others. Online instructors need to address the difference in perspectives as they design the online course and student-to-student interactions. As noted previously, recommendations include faculty communicating expectations, modeling dialogue and collaborative interaction, and ensuring accountability through individual student assessment for group activities (Crawford-Ferre & Wiest, 2012).

Student-to-Instructor Interaction. Similar to student-to-student interaction, business students in this study prefer the interaction with their instructor in the FTF classroom in support of several prior studies (Dumford & Miller, 2018; Fish & Snodgrass, 2014; Garrison & Vaughan, 2008; Mather & Sarkans, 2018; Pointer et al., 2019; Smith et al., 2019; Spencer & Temple, 2021; Wang & Morgan, 2008; Wuensch et al., 2008). Both online and FTF students have changed their perspectives of this factor over the three survey years. Online students are trending toward liking online interaction with their instructor less than in the past, while FTF students are even more positive in 2021 about traditional student-to-instructor interaction than in the past. Essentially, both groups are trending toward liking FTF more than in the past. While instructors at the institution have done an admirable job addressing the difficulty factor between the two environments, recommendations for improvement include improving the establishing fundamental rules for the online course, and facilitating and supporting effective communication (Mather & Sarkans, 2018) as well as offering synchronous sessions (Smith et al., 2019). Online instructors need to be as flexible, supportive and communicative as possible (Beach, 2018).

Cheating.   Online and FTF business students – regardless of the survey year – perceive that its easier to cheat online, in support of many prior studies (King et al., 2009; Pointer et al., 2019). Neither online or FTF business students have changed their perspective on this factor. (Note, the University does not currently provide proctoring services for exams.) While the instructor makes decisions regarding the software and use of potential cheating detection programs (such as TurnItIn), resources to deter cheating are needed and the responsibility to provide these rests with administration.

CONCLUSIONS

Technology has changed since the original survey (2012) on student perspectives of program factors. However, our second survey just prior to the pandemic did not demonstrate significant changes in student perspectives on most program factors. At the time, we noted that perhaps a longer time is needed before the perceptions will change. Just two years later, the pandemic changed this as a significant number of students at the University have now experienced online education. With respect to program factors, which are the decisions that instructors make in developing the course – online or FTF, changes in business students' perspectives occurred from prior years, particularly for online students. In designing online courses, instructors have made tremendous strides in difficulty as online students today perceive the two environments as indifferent. However, online instructors have significant work to do with respect to student and instructor interaction. Business students at the University perceive that its easier to cheat online than FTF. Changes to students' perception of cheating require support for resources (such as software and proctoring services) that administrators need to address. Following the pandemic, it will be interesting to note the number of students requesting online courses versus FTF as well as any changes in instructor's online course design, administrative support, and student perspectives.

Limitation. In 2021, very few FTF students (12) that had never taken a full semester online course remained due to the pandemic. However, the 2021 FTF student results were similar to the two prior surveys as a shift only occurred on one factor.

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APPENDIX

2021 Student Results

Factor	Average Response		Online Response					Face-To-Face Response				
	OL	FTF	1	2	3	4	5	1	2	3	4	5
Difficulty	2.99	2.17	15	29	56	35	11	3	5	3	1	0
Student-to-Student Interaction	2.39	4.25	40	41	43	12	10	0	0	3	3	6
Student-to-Instructor Interaction	2.49	4.50	31	48	45	8	14	0	0	1	4	7
Cheat	2.44	4.25	21	51	63	8	2	0	0	2	5	5

Online Students Responses by Year

Factor	2012					2018					2021				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Difficulty	7	17	14	6	0	8	29	35	10	0	15	29	56	35	11
Student-to-Student Interaction	2	21	13	7	1	13	29	22	15	3	40	41	43	12	10
Student-to-Instructor Interaction	4	20	10	9	1	5	33	34	8	2	31	48	45	8	14
Cheat	6	19	13	5	1	15	27	37	3	0	21	51	63	8	2

FTF Students Responses by Year

Metric	2012					2018					2021				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Difficulty	5	32	10	19	1	2	18	14	17	1	3	5	3	1	0
Student-to-Student Interaction	1	1	6	33	26	2	2	11	20	17	0	0	3	3	6
Student-to-Instructor Interaction	1	0	3	30	33	2	0	13	20	17	0	0	1	4	7
Cheat	1	1	15	35	15	1	3	10	26	12	0	0	2	5	5

Ethnicity and the Generation of Students Related to the Effects of Snowstorms on College Educated Business Students

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ABSTRACT

This paper investigates the perceived hardships of undergraduate students during severe snowstorms based on ethnicity and first-generation students. Using approximately 380 observations, we find that there is a difference between ethnicity and generation of student during the interruption of student classes related to snowstorms in the spring of 2018. The paper uses survey data at an AACSB accredited business school. The authors find that using a univariate and a multivariate there is a difference in the results. The empirical results were robust under all the models.

Keywords: higher education, business schools, first-generation, minority students, natural disasters, student impacts

INTRODUCTION

The authors investigate how an instructional interruption during severe snowstorms in the spring semester of 2018 impacted first-generation and minority students compared to their peers by using survey data from 376 - 380 observations. The authors used mean differences t-statistics and multiple variable analysis to determine how these factors effected students. Using a survey instrument, we found that second-generation or more students were less negatively impacted than first-generation students. The survey questions where the dependent variables are ethnicity and generation of student. The authors also found that non-white students were more impacted than white students. This paper is based on prior research, Wynne, Leary, and Sholes (2018) and Wynne, Sholes, Nam, and Leary (2019), that used survey instruments to analyze various aspects of student learning. This paper is an extension of those papers. The survey is based on a survey of snowstorms from the Spring 2018 and the survey was conducted in 2019.

LITERATURE REVIEW

Research in student retention, persistence, and the obstacles that have a negative impact in their overall educational experience has been an area of focus for decades. However, as environmental changes continue to create devastating weather events, research in how these natural disasters impact student success is limited. Wynne, Leary, and Sholes (2018) analyze how Hurricane Sandy and series of snowstorms impacted student at an AACSB accredited university in the northeast. They focused on how urban and suburban schools differed in the student management approach during these storms and found how commuter and dormitory students were impacted differently. The results showed that the duration of the weather events, amenities the schools provided, and individual faculty decisions can directly influence students' perceived impact in their financial hardships, overall educational experience, career concerns, and time demands.

Wynne, Sholes, Nam, and Leary (2019) further evaluated how disruptions caused by natural disasters impact student groups based on grade point average (GPA), gender, academic major, and their year of study. This paper found that junior and senior college students perceived a greater impact on their educational and career concerns than the freshmen and sophomore students surveyed. It also found that students with lower GPAs perceived a greater impact on their educational experience than those students with higher GPAs. However, there were no statistically significant differences on how male and female students perceived the impacts of these natural disasters. Despite this growing depth of research, there is still limited knowledge on how these environmental events impact first-generation and minority group college students.

First-Generation College Students

The challenges associated with college differ for each student, but students who come from minority or low socioeconomic backgrounds often face obstacles and difficulties that other students do not experience (Blackwell & Pinder, 2014). To understand how these at-risk students preserve and persist to graduation, the researchers used a qualitative approach consisting of two student groups. A group of first-generation college students were compared to a group of third-generation college students. The findings showed that the third-generation college students had more support and encouragement from their families, but the first-generation students all had three common causal conditions motivating through to graduation: 1) a love for reading, 2) feeling different from their siblings, and 3) a deep desire for a better life. While the families of the third-generation students always expected them to attend college, the first-generation students found college to be a vehicle of survival. However once on campus, the first-generation students found the drive to persist through peer groups with similar backgrounds and histories.

Pratt, Hardwood, Cavazos, and Ditzfeld (2019) found that despite the drive that gets first-year college students into the classroom, many of them still face financial concerns and additional employment demands unlike multi-generational students. The researchers used a quantitative approach by evaluating 3,118 first-time, full-time college student sample that consisted of 23% first-generation students through an online survey. The results of the survey showed that many students are impacted by financial insecurities, but first-generation students show a greater level of impact as related to attrition. The results also showed that first-generation students are more likely to work more hours while enrolled compared to their other classmates. This additional demand of time also impacts their level of involvement on campus and within the academic community, pulling them away from the very support system that could encourage persistence through completion.

In order to better understand the significance financial concerns, have on the success of first-generation college students, Reynolds and Cruise (2020) used a quantitative approach in their research focusing on household income levels and undergraduate attitudes of persistence. They surveyed 161 students using the College Persistence Questionnaire and used a one-way ANOVA with a dependent variable of undergraduate persistence and independent variables of household income and parental educational level. The results showed that in a population of mostly White/Caucasian (76%), female (78%) undergraduate students, financial strain and degree commitment were a significant issue for those that identified as first-generation college students. They also found that these challenges were compounded when the students came from a middle to low socioeconomic background.

While it is clear that parental educational and income levels have a significant impact on student success rates, McCulloh (2020) found that parental informational, emotional, and instrumental support also contributed to the success of first-generation college students. In this research, informational support is defined as sharing information, emotional support is expressing faith and love towards the student, and instrumental support is the provision of time, resources, or financing. First-generation college students often perceive less informational and emotional support from their parents compared to multi-generational students. By using a qualitative case study approach, McCulloh (2020) found that rural first-generation college students generally perceived support from their parents in their persistence towards a college degree. However, the support that was needed for success went beyond the household to extended families and their community. When the familial unit was unable or unwilling to provide the support needed, successful first-generation students found "the support networks within their communities offered direction to the resources that minimized anxiety associated with being the first in the family to attend college" (McCulloh, 2020, p. 17).

A foundational principle of higher education institutions has been *in loco parentis*, and while schools have backed away from the role in certain circumstance, they are increasing their involvement in many support areas that would fulfill the informational, emotional, and instrumental needs of first-generation students (Patel, 2019). Typically, the programs developed by institutions attempt to assist students in acclimating to campus life and/or provide supportive resources throughout their academic program. Folger, Carter, and Chase (2004) used a quantitative research method to measure the effectiveness of a small group program that provided support to first-generation freshmen students through their first year on campus and found those who participated in the program had a significantly higher GPA than similar students who chose not to participate. Schelbe, Becker, Spinelli, and McCray (2019) took a more qualitative approach to measure the perceived effectiveness of an academic retention program. They use four focus groups and six interviews of twenty-five students participating in a program designed to help students transition to campus and support them throughout their academic career. Participants believed the program helped them build community relationships, set academic performance expectations, develop skills and ability that assisted with the

transition, and provided them with tools and resources to help them be successful. They found negative side effects to the program as well, where participants experience a stigma from their peers suggesting they did not belong at the institution or had an easier time being admitted. Finally, some participants felt the support provided didn't adjust to the changing needs of students as they progressed beyond their sophomore year.

Minority Groups

Students who identify as part of a minority group are often also first-generation college students; however, their experience can be different and driven by other motivational factors. Saroughi and Kitsantas (2021) examined the personal, contextual, and wellbeing variables among Immigrant Language-Minority (ILM) students to determine their impact on retention and academic success. The researchers used a quantitative approach to measure personal factors including self-efficacy for learning and self-regulation, contextual factors such as stereotype threat and sense of belonging, as well as wellbeing factors like positive/negative effects and academic/life satisfaction. The data was collected using a survey link that was distributed to students at a large public university via students' current instructors. The results showed that a sense of belonging had a direct impact on all other variables. Students who lacked a sense of belonging also appeared to be less self-efficacious and less self-regulated. Those students who had a higher sense of belonging developed more positive beliefs in the ability to achieve their academic goals. Additionally, they found that students who experienced greater levels of stereotype threat also had lower levels of self-efficacy for learning. The trickle-down effect of these factors is that positive academic satisfaction was found to be a strong predictor of a student's life satisfaction. The conclusion of this research is that ILM students need to have positive relationships with instructors and peers in order to develop positive personal, contextual, and wellbeing variables that support their success.

One type of program colleges and universities have identified as best practice to connecting minority students to instructors and peers is a bridge program that attempts to narrow the gap between high school and college. Howard and Sharpe (2019) evaluated the efficacy of a summer bridge program that focused on increasing retention and academic success among minority students in STEM programs. Participants in this program received daily class instruction in college algebra and English with the goal being academic preparation for their first core English and mathematic courses in college. By following the academic careers of those students who participated in the program, researchers were able to compare their success rate to state and regional levels. The results showed that at least 78% of participants in the bridge program achieved a "C" or above in their first English course and at least 70% of participants achieved a "C" or above in their first math course. Overall, 92% of participants were retained beyond their freshman year of college and 72% remained STEM majors. The researchers concluded that exposing minority students to college life before the start of their freshman year is an effective way to increase retention and academic success within STEM.

While bridge programs may help prepare minority students for academic success, Back and Keys (2020) evaluated how four factors of empowerment (self-efficacy/control, university environment, finance confidence, and student racial/ethnic indemnity) were related among minority students once they had matriculated. Participants in this research were given an online survey and their responses were evaluated using the College Student Empowerment Scale. Through their analysis, researchers found that minority students perceived a greater impact on their academic success from the Supportive University Environment and Financial Confidence. Financial Confidence includes all items related to the funding of college. The research showed that efforts to support students must include the acknowledgement of financial need and that without these funds students feel disempowered resulting in an increased dropout rate. A Supportive University Environment was identified as the perceived ability of the institution to meet student needs and on-campus engagement. Students not only recognizes these efforts and see them as essential in the empowering process, but also believe these efforts help and find their connection to the university community to be crucial in their success.

On a more personal level within the university, research shows that faculty members play a large role in student success (Burnaford & Hobson, 1995; Conrad, 2005; Lamb & Jacobs, 2009). However, Dickson and Zafereo (2021) found that the faculty need to not only be supportive but also representative to have the greatest level of impact on minority student success. The researchers used 10 years of data from 231 academic programs to determine the effects that faculty and program characteristics had on graduates of color. The results found graduation rates for people of color were increased when faculty members were able to spend a quarter of their time on academic research and when programs had sufficient financial resources. However, the most significant finding was the positive relationship between a significant number of a program's faculty being of color and the success of graduates of color. The research

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found that once a critical mass has been established within a program, one percentage point increase in the faculty of color could result in a 33% increase in its graduates of color.

Another area within a supportive university environment that has positively impacted minority student success rates is academic advising. Museus and Ravello (2010) researched the role Academic Advisors play in helping students of color achieve their academic goals. The researchers used a qualitative approach to gather rich and detailed information from a wide range of institutions that could offer insight into the impact academic advising has on minority students' ability to persist through degree completion. Participants in the study identified three areas that provided a positive impact: humanized academic advising, holistic academic advising, and proactive academic advising. Humanization of advising includes advisors being view by the students as human beings and advisors caring and committed to minority students' success. A holistic approach to advising recognizes that minority students face problems that are often multifaceted and they provide support and resources regardless of the foundational issues. (e.g., academic, financial, etc.). The proactive approach to advising requires advisors to assume responsibility for connecting with minority students with available resources that support student success. These findings provide another component necessary for colleges and institutions to support minority students and help them overcome the unique challenges they face in achieving their academic goals.

MODELING

The authors first used univariate approach to test mean differences between ethnicity and generation of the students. They develop two null hypotheses.

Null Hypothesis 1: There is no relation between generation of students and the effect related to the seven-question survey. The dependent variable is the series of questions and the independent variable is the generation of students.

Null Hypothesis 2: There is no relation between the ethnicity of students and the effect related to the seven-question survey. The dependent variable is the series of questions and the independent variable is the ethnicity of students.

The survey used for ethnicity is based on the United States consensus data survey. We divided ethnicity into white and non-white categories. The generation data was divided between first-generation students and second or more students, this allowed us to create a larger sample size. The equation is written as:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots \beta n\ Xn + \varepsilon_t \qquad (1)$$

Where Y is the dependent variable is related to each of the survey questions run in seven separate regressions using the survey instrument. The survey is in Appendix A. The independent variables are the ethnicity and generation of the students. Then the authors wanted to make sure that ethnicity and generation were not correlated. Therefore, we ran a simple regression with generation as the dependent and ethnicity as the independent variable. The equation can be written as:

$$Y = \alpha + \beta_1 X_1 + \varepsilon_t \qquad (2)$$

Where Y is the generation of the students and X_1 is the ethnicity of the students. The authors then used the residual term for ethnicity to be included in the model.

$$\varepsilon_t = Y - (\alpha + \beta_1 X_1) \qquad (3)$$

This made both of the variables orthogonal to each other. This ensured that the correlation coefficients between the variables are zero. This is following the approach by Graham-Schmidt (Björck, 1994). This allowed the authors to test further that there was no relationship between the two variables and would allow to make sure the responses are independent of each other.

EMPIRICAL RESULTS

Table 1 provides the demographics of the survey related to the survey instrument. The survey is included as appendix A in the paper. The number of observations ranged 375 to 380. This discrepancy was because a few students left some answers out. Under most areas we find that the results are equally divided, such examples as 53% of the students were female and 58% were dorm status. As related to this paper, 33% percent of the students in the sample are non-white. First-generation students account for 37% of the sample.

Table 1: Student Demographics

Major (n = 375)	Percentage	Ethnicity (n = 376)	Percentage
Accounting	29.33%	White	66.76%
Finance	14.67%	Hispanic	13.83%
Management	15.20%	Asian	8.24%
Marketing	15.73%	Black	8.51%
Other	25.07%	Other	2.66%
Gender (n = 379)	Percentage	Year of Study (n = 376)	Percentage
Female	52.51%	Freshman	16.49%
Male	47.49%	Sophomore	29.26%
		Junior	34.04%
Residence Type (n = 379)	Percentage	Senior	20.21%
Commuter	41.80%		
Dormitory	58.20%		
Generation College Students (n = 381)	Percentage		
First Generation	37.01%		
Second Generation or More	62.99%		

Table 2 provides mean differences between ethnicity. The authors find that the non-white sample were more effected related to significant t-statistics for financial hardship, educational experience and additional hours were significant with a p-value .10. In relation to educational concern and career concern the authors find that these 2 variables were significant at the .05 p value. It is obvious that educational concern and career concern were more significant than financial hardship, educational experience and additional hours in this study. Although some of the t-statistics are relatively low in some cases, all of the mean differences are positive.

Table 2: Ethnicity Mean Differences

	Non-White Mean (n = 129)	White Mean (n = 253)	Mean Differences	T Stat	P-Values
Financial Hardship	1.57	1.42	0.16	1.61	0.054*
Educational Experience	2.54	2.31	0.23	1.62	0.053*
Additional Hours	3.05	2.84	0.21	1.34	0.090*
Educational Concern	2.43	2.16	0.26	1.74	0.041**
Career Concern	1.74	1.55	0.19	1.72	0.043**
Course Changes	2.91	2.85	0.06	0.39	0.348
Additional Time	3.31	3.26	0.05	0.32	0.375

Note: p-value results: *,**,***Significant at 0.10, 0.05, and 0.01 levels, respectively

In table 3, we find thar second generation were more concerned about financial hardship than first generation students This variable was significant at with a p-value of .01. Obviously, financial hardship for second generation was the

most significant factor. Educational experience was also significant at .05. Again, although the t-statistics were relatively small overall, we do find that mean difference are all negative.

Table 3: Generation Mean Differences

	Second Generation + Mean (n = 239)	First Generation Mean (n = 143)	Mean Differences	T Stat	P-Values
Financial Hardship	1.34	1.69	-0.35	-3.49	0.0003***
Educational Experience	2.28	2.57	-0.29	-2.02	0.022**
Additional Hours	2.87	2.99	-0.12	-0.77	0.221
Educational Concern	2.22	2.32	-0.10	-0.71	0.239
Career Concern	1.57	1.69	-0.11	-1.04	0.149
Course Changes	2.89	2.85	0.05	0.31	0.378
Additional Time	3.35	3.17	0.18	1.23	0.109

Note: p-value results: *,**,***Significant at 0.10, 0.05, and 0.01 levels, respectively

Table 4 uses an Ordinary Least Squares (OLS) approach on the same variables. The sample size for these variables were 380 observations. This multi-variate approach for ethnicity was consistent with the univariate approach. Educational concern and career concern were significant with a p-value of .10 for ethnicity. Financial hardship was significant with a p-value of .01 for first-generation students. Educational experience was also significant with a p-value .10 for first-generation students. The empirical results were consistent with the univariate and multi-variate approach and demonstrates the robustness of the models.

Table 4: Regression Model 1

Snowstorms

	Financial Hardship	Educational Experience	Additional Study Hours	Educational Concern	Career Concern	Course Rigor	Additional Class Time
Observations	380	380	380	380	380	380	380
Alpha	1.89	2.56	2.76	2.00	1.49	2.66	2.81
F-Test	7.37	2.96	1.14	1.70	1.98	0.21	1.01
R Square	0.04	0.02	0.01	0.01	0.01	0.00	0.01
Ethnicity	0.08	0.18	0.21	0.26	0.18	0.09	0.11
T Stat	0.86	1.24	1.30	1.69*	1.67*	0.56	0.69
P-Value	0.39	0.21	0.19	0.09	0.10	0.57	0.49
Generation	-0.33	-0.26	-0.07	-0.06	-0.08	0.06	0.20
T Stat	-3.48***	-1.78*	-0.47	-0.38	-0.71	0.42	1.36
P-Value	0.00	0.08	0.64	0.71	0.48	0.67	0.17

Note: p-value results: *,**,***Significant at 0.10, 0.05, and 0.01 levels, respectively

The final test was to ensure that the independent variables had no effect on the model. In Table 5, we first regressed ethnicity on the generation. The authors then used the residual of the ethnicity in the model. The ethnicity was significant related to educational concern and career concern. Both were significant with a p-value of .10.

Again, generation was significant. Financial hardship was significant with a p-value of .01. Educational experience was significant with a p-value of .10. The empirical results presented in the paper are robust and allows the authors to reject the null hypothesis 1 and 2.

Table 5: Orthogonal Model 2

Snowstorms

	Financial Hardship	Educational Experience	Additional Study Hours	Educational Concern	Career Concern	Course Rigor	Additional Class Time
Observations	380	380	380	380	380	380	380
Alpha	1.27	2.09	2.60	1.92	1.37	2.79	3.23
F-Test	7.17	2.90	1.24	1.43	1.60	0.15	0.96
R Square	0.04	0.02	0.01	0.01	0.01	0.00	0.01
Ethnicity	0.15	0.23	0.24	0.24	0.18	0.05	0.03
T Stat	1.52	1.56	1.51	1.63*	1.65*	0.35	0.23
P-Value	0.13	0.12	0.13	0.10	0.10	0.73	0.82
Generation	-0.33	-0.27	-0.07	-0.07	-0.08	0.07	0.21
T Stat	-3.46***	-1.84*	-0.46	-0.46	-0.70	0.43	1.37
P-Value	0.01	0.07	0.65	0.65	0.49	0.67	0.17

Note: p-value results: *,**,***Significant at 0.10, 0.05, and 0.01 levels, respectively

CONCLUSION

The paper demonstrated that ethnicity and generation of study had an effect on educational experiences. Using univariate and multivariate approaches the authors found than non- white students were more effected due to the snowstorms. Second-generation or more students were also less effected than first generation. The results were consistent with McCulloh (2021) and Saroughi and Kitsanta (2021). The next research project will use a similar approach to investigate the effects on the student experience related to Covid. In certain cases, the differences between white and non-white were relatively small although the signs were correct, it was not as impacted as significant signs from the first and second generation.

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APPENDIX

Snowstorms Survey

This is a survey about how natural disasters affect the educational process. The following questions are related to your experience during the recent snowstorms that interrupted your Spring 2018 semester. The responses should be based on your overall college experience and not to one particular faculty member. Please only complete one survey. Thank you for your assistance.

College:_____ Major:_____

Status   ☐ Commuter/Off Campus Resident   ☐ Dorm Resident

Sex   ☐ Female   ☐ Male

Year of Study ☐ Freshman   ☐ Sophomore   ☐ Junior ☐ Senior   ☐ Other

Which category best describes you as a college student:

☐ First Generation   ☐ Second Generation or more

Which category best describes you: ☐ White   ☐ Hispanic, Latino, or Spanish origin

       ☐ Asian   ☐ Black or African American   ☐ Native Hawaiian or Other Pacific Islander

       ☐ American Indian or Alaska Native   ☐ Middle Eastern or North African

       ☐ Other, please specify: _____
Approximate GPA: _____

1. Did you experience any financial hardship related to the snowstorms?
No Financial Hardship   1   2   3   4   5   Extensive Financial Hardship

2. In terms of your overall educational experience, do you feel that you were negatively impacted because of the snowstorms?
Not Affected   1   2   3   4   5   Very Affected

3. Did you put in additional hours after the snowstorms to catch up on your course work?
Not Really   1   2   3   4   5   Definitely

4. Are you concerned that the snowstorms disruptions have negatively impacted your preparation for the remaining courses in your college experience?
Not Concerned   1   2   3   4   5   Very Concerned

5. Are you concerned that the snowstorms disruptions have negatively impacted your preparation for the job market?
Not Concerned   1   2   3   4   5   Very Concerned

6. Do you feel that your faculty members overall changed the rigor and approach to the course because of the snowstorms?
Not Really   1   2   3   4   5   Definitely

7. Did your faculty members attempt to add additional hours or written assignments to make up for the loss of class time?
Not Really   1   2   3   4   5   Definitely

Introducing Gen Z and Millennial Students to Business Accounting Complexity Through a Low-Cost Experiential Learning Activity

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ABSTRACT

Research within accounting education has found that Experiential Learning Activities (ELAs) have been a beneficial learning activity (Gittings, Taplan, Kerr 2020). In small business education, ELAs tend to be focused on students working with a business. While this is the ideal learning opportunity, having students jump right into such an activity can be overwhelming and at times not feasible. Such activities became more complicated during the pandemic or with any online learning format. One way to include ELAs in small business education is using reality television shows available on YouTube. Gen Z and Millennials are very engaged with YouTube often using it weekly if not daily (Baron, 2019). Not only are students drawn to video it is also a source of free content. The cost of higher education has steadily increased over the past several decades (Coker and Glynn, 2017). One way to help students with affording their education is to find low/no-cost materials. The following will demonstrate the potential for this activity for small business education through the show of The Profit and its use in preparing small business accounting students before working directly with a small business.

Keywords: experiential learning activities, online education, low-cost material, accounting education, small business education, The Profit

INTRODUCTION

Experiential learning is an engaged learning process whereby students "learn by doing" and by reflecting on the experience (Butler, Church, and Spencer, 2019). This contrasts with traditional instructor centered methods that focus on lecture and problem-based exercises (Gittings, Taplan, Kerr 2020). The goal is to provide students the opportunity to apply their knowledge and skills to real-world situations.

To be considered "experiential" the activity should include space for reflection, critical analysis, and synthesis. Butler, Church and Spencer (2019) presented the "Do, Reflect, Think, and Apply" method for ELAs in accounting education. The "Do" is where the learners participate in the experience. After that they "Reflect" on the experience and other related information. Learners must then "Think" about what they can develop from that experience. After the knowledge is obtained from the experience the learner can "Apply" by forming a conclusion or solving a new problem. ELAs are opportunities for student to take initiative, make decisions and be accountable for the results.

With traditional accounting education the focus is on task completion, memorization, and clear-cut answers. In the real-world accounting practice often does not have clear-cut answers. The accounting profession expects graduates to possess critical thinking skills and professional judgement. Experiential education can facilitate this learning.

Client consulting is often an example of an ELA that is used in business education. One issue with this task is the quick move from the classroom to a real-life situation without any training on how to apply textbook knowledge to the client. This might be overwhelming to the student. Another issue is applying a real-life business consulting engagement within an online course. Enrollment in online courses is increasing for a variety of reasons. It is important to incorporate ELAs that can bridge a student from the classroom to the real world and be used in an online environment.

Video has been used within accounting education to provide a "feel" for what happens in a real-world situation. Siegel, Omerz and Agrawal (1997) found significant improvement in student performance in an auditing class by using video supplement. Video allowed for students to experience an audit and gain better understanding of the process compared to text reading alone. Today's student is very comfortable with using visual content and often use YouTube on a weekly and even daily basis. Gen Zers have said that watching videos help them feel more connected to others and they learn from storytelling and entertainment (Baron, 2019). The key to using video with today's student is to keep the video short. It is also important to maintain affordability of course materials. The cost of education has continued to increase. Various student surveys have shown students not buying a textbook or deferring a class due to the cost

of materials. Sites such as YouTube provide a variety of free content that is broken down into small viewable segments.

Specifically, use of business-based reality TV shows such as the "The Profit" have been demonstrated to be useful for management education (Cortijo, 2017). Various episodes were identified as containing learning opportunities for demonstrating important decisions that managers must make while running their business. This paper presents an activity that focuses on using condensed versions of the show for purposes of training accounting students how to help business owners with some of those decisions.

The activity presented in the paper applies the "Do, Reflect, Think, and Apply" model to a free experiential learning activity that can be applied to an online environment and be a bridge between the classroom/textbook to working with a real business. Students can gain valuable experience by accessing 10-min episodes of the series "The Profit" on YouTube, reporting on the experience, and applying their new knowledge to a different scenario.

THE ACTIVITY

The series The Profit, features entrepreneur Marcus A. Lemonis, chairman and CEO of Camping World, and his encounters with struggling businesses. He visits business to discuss with the owners the challenging issues they are facing, he gives advice, and potentially makes a capital investment in the business. The entire episode is available through various streaming options, but 10-minute condensed versions are available for free on You Tube and often remove sensationalized filler. This popular show is currently in its 8th season on CNBC. The show combines entertainment with valuable information in an effective storytelling technique. A variety of business scenarios have been part of the show and it creates a unique opportunity to present various cases to students. While many different entrepreneurial type classes could benefit from adding the show, it is especially in-line with accounting. In a small business accounting class, most students have a good understanding of the basic concepts but have never applied them to a real business. This ELA allows for students to experience a real world setting of various accounting concepts used in small businesses as well as the complexity of dealing with a business owner. Many accounting students do not have the experience of having to explain accounting concepts to non-accountants and have never had to convince someone of the importance of the information. The show brings in the accounting and finance part of doing business as well as the human aspect.

The small business accounting class that this ELA is used in is a graduate level Master's of Professional Accountancy class. Students spend seven weeks on course work, then the remaining semester is spent working with a small business. The course is typically a capstone and thus the students are highly competent in accounting, but not really in working with a small business owner. To prepare them for the task, the Do, Reflect, Think, and Apply method (Butler, Church, and Spencer, 2019) is incorporated with watching 10-minute YouTube snips of the show. Often in accounting, students are expecting a problem they have previously practiced and so know the steps to solve it. They get frustrated when a problem is presented in an unfamiliar context or with additional unneeded information. With the short video, students can see that problems in the real world are presented in complex scenarios and contain a lot of noise. They can reflect on what they observe (what did Lemonis point out as issues with the business and how did the owner respond), think about how that observation changed their thinking and then discuss how they would apply what they learned to another business situation. With the videos only being 10 minutes each, multiple situations can be experienced by the student.

Table 1: Do, Reflect, Think and Apply Method and The Profit Assignment

Do	Watch a 10-min video from a pre-determined list. This list is obtained from episodes labeled as "The Profit in 10 Minutes." These videos present a complex problem with lots of noise. The important details of the entire show are condensed into 10 minutes.
Reflect	Reflect on what Lemonis points out as the issues and how the owner responds. Consider other alternatives. Students provide a written summary of their reflections.
Think	Think about how that observation changed their approach to the issue and how they would handle the situation. Students provide a written summary of their thoughts.
Apply	Apply what has been learned to another business situation. Watch another 10-min video from a pre-determined list. This list includes videos titled "The First 10-Minutes." These videos setup the situation but do not get to the conclusion of the episode. Students answer the question: If this business was your client, how would you identify, explain, and consult on the accounting issues? Discussion can be conducted in class or through virtual discussion boards. The students are asked how they would approach looking for accounting issues within a small business and how to communicate with a small business owner.

Table 2: Sample List of Episodes for "The Profit in 10 Minutes"

Detroit Denim	Company specializes in selling hand-made raw denim jeans for men in addition to other clothing, shoes, and accessories. There are three partners. One partner has strong opinions about not expanding product offerings, the partner in charge of production has overcomplicated the process, the third partner is in charge of the financials but has not completed the financial information in over six months. This episodes introduces students to dealing with multiple partners with different ideas and a company lacking current financial information that is needed to make current decisions.
Unique Salon & Spa	This episode focuses on a struggling salon chain. Issues for the business include inventory management (no process in place for knowing when to reorder hair color), understanding of the chain of command within the store so that things like a broken A/C does get fixed, owner not paying herself for the last six months, and lack of appeal to the salon itself. Lamonis addresses these issues, and the students have the opportunity to see how these improvements benefited the business.
Zoe's Chocolate Co.	This is a family-owned business that has been in operation for several years, but is unable to make a profit and support the family. In this episode the owners are reluctant to agree to changes, but have to accept or the business will have to close. Issues that are focused on are new product offerings and new revenue opportunities.
SmithFly	This outdoor gear company focuses on fly fishing apparel and equipment. In this episode the owner is introduced as being very good at designing and making the product, but poor at listening to input from others. The office manager is in charge of everything else including the accounting. This episode focuses on helping the owner take advice and branch out of using just his ideas and moving the office manager into roll she is better at (sales) and out of working on the accounting.

Table 3: Sample List of Episodes for "The First 10-Minutes"

Grey Block Pizza	This pizza company has been around for several years, but family obligations have caused one owner to move out of town and leave the initial silent partner to run the management side of the business. The main issue that is presented in the first 10 minutes is that there is no consistency on how to make a pizza and nobody knows the actual cost. When they make a pizza with Lamonis it is determined that the actual cost of the ingredients used was more than the price they were selling it for. This is an opportunity for students to make suggestions on product costing, partnership structure, and finding a manager to run the business.
Harvest Lane Honey	This manufacturing company provides beekeeping products and supplies and also manufactures and assembles wooden hives in Utah. Despite increased revenues the company is operating at a loss with a large amount of interest expense on debt they used to expand. There are also inefficiencies in the manufacturing process. This is an opportunity for students to make suggestions on debt issues, capacity constraints, and manufacturing efficiencies.
Key West Key Lime Pie Co	This company is known for their primary product, key lime pie. They have multiple locations and sell a variety of key lime related products in their store that are from other businesses. The business does not have enough cash on hand to pay the bills and is not focusing on their key product. This is an opportunity for students to make suggestions on cash management and product focus.

CONCLUSION

While the Profit covers a wide range of business types, there are other shows available that focus on specific areas such as restaurants, hospitality, or general start-ups.   There are many advantages of using these realty shows over an activity such as reading a case. Not only are college students already accepting of the medium (videos and specifically YouTube) the material is constantly updated and since these types of shows seem popular in general there will be new ones arriving each semester (season). There is also the added benefit of the cost. While some shows are only available through streaming subscriptions, many are available on YouTube for free and often like The Profit edited down to a more manageable time frame. Furthermore, it is an active learning activity which can help cultivate greater understanding, improve problem-solving skills and critical thinking ability (Butler et al., 2019). Finally, there has been an increase in online learning which makes it more difficult to conduct in person experiential learning opportunities. While not a complete substitute, using these reality television shows can add some experience to the online environment.

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Logic Puzzles to introduce Binary or 0 – 1 notation for Integer Programming

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ABSTRACT

Teaching quantitative courses in the School of Business is challenging. Our students take a core course related to *Operations Research* in the undergraduate as well as in the graduate program. Linear Programming (LP) and Integer Programming (IP) problems are considered challenging to formulate using algebraic notation. In the case of Integer Programming, binary or 0 – 1 algebraic formulation is required. Since such formulation can be especially challenging even for graduate students, we adopt an innovative approach and introduce our students to Logic puzzles. With the help of these word/logic puzzles, the students gain experience with 0 – 1 algebraic notation. Interestingly, our students perceive this as fun activity and enjoy the solution process. We believe this is an excellent investment of time because the students stay focused and engaged even when we eventually discuss topics such as LP and IP.

Keywords: Integer Programming, Logic Puzzles, Algebraic formulation, binary or 0-1 notation

INTRODUCTION

Courses like Operations Research have generally been considered as "hard" classes by Business School students. As faculty, we emphasize on the importance of such coursework by providing real world examples of how problems in the industry have been solved by applying mathematical tools and techniques. We use articles, Business cases, news reports, and videos to reiterate the importance of such coursework. Topics such as Linear Programming and Integer Programming are not only challenging for the students but can also be challenging for faculty to teach. Even the students with good quantitative skills are not comfortable when asked to formulate problems by using algebraic notation. Hence, we chose to intervene and take a different approach by using Logic puzzles. We were reluctant at first to use puzzles in the classroom. However, we knew that the only way to find out is by trying this non-traditional approach. Fortunately, the students responded positively to this "learn while we play" method. The class participation was high and remained so even when discussing topics like Integer Programming.

INTEGER PROGRAMMING

An Integer Programming problem (IP) is an LP (Linear Programming) in which some or all variables are required to be non-negative *integers*. Integer Programming problems may be further classified as pure IP problems (where all variables are required to be integers), mixed IP problems (where only some variables are required to be integers) and binary or 0–1 IP problems (where all variables must equal 0 or 1). Typically, 0 – 1 IP problems are challenging to formulate, occur in surprisingly many real-life situations, and play an especially important role in the applications of IP problems. The purpose of this article is to expose the students to the *formulation* of 0 – 1 IPs by using Logic Puzzles.

We provide two examples of 0 – 1 IP problems in Appendix B. Example 1 is the classical *knapsack problem* that can be found in various Operations Research textbooks (Gould et al., 1993, Hillier and Lieberman, 2021, Winston and Albright, 2019). Example 2 is a *Set-Covering problem* and similar problems can be found in several textbooks (Hillier and Lieberman, 2021, Winston, 2004, Taylor, 2018). These are examples of real-life problems, and challenging to formulate. To overcome this challenge, we introduce Logic Puzzles as a starter. Our experience has shown that the students not only enjoy these puzzles, but they learn the 0 – 1 notation quickly. They also stay motivated when we formulate real-life and more challenging problems found in textbooks (Hillier and Lieberman, 2021, Winston, 2004).

LOGIC PUZZLES

Converting word problems into algebra is a stumbling block for most students. Hence, we use Logic puzzles as a starter. These are simple puzzles and keep the students engaged. There are plenty of word puzzles that are analytical in nature and can be solved in very little time even without any algebraic notation. Such puzzles can be found in various books and even on the internet: www.kinetigram.com/ladue/Geometry/Geo/GeoNotesCh02.5.pdf. In this section, we present three simple puzzles that we have discussed and solved in the classroom by exposing the students

to algebraic notation (binary or $0-1$ notation, to be precise). Interestingly, the level of participation level of our students is high, they pay attention and enjoy the solution process without even realizing that they use algebraic notation to determine the solutions.

Logic Puzzle 1

Nancy, Olivia, Mario, and Kenji each have one piece of fruit in their school lunch. They have a peach, an orange, a banana, and an apple. Use the following four statements/clues to help you determine which person has which fruit.
1. Mario does not have a peach or a banana.
2. Olivia and Mario just came from class with the person who has an apple.
3. Kenji and Nancy are sitting next to the student who has the banana.
4. Nancy does not have a peach.

Preliminaries: We wish to make it clear at the very outset that none of the Logic puzzles presented in this paper require Integer Programming techniques or any algebraic notation to solve them. In fact, they can be solved without using any algebraic notation as demonstrated in Appendix – A. Interestingly however, these puzzles lend themselves to the 0-1 notation that is commonly used in several real-life IP problems. And since such IP problems can be difficult to formulate, we have used these puzzles in the classroom as a starter and this helped the students immensely.

Before solving this puzzle, we introduce the binary or $0-1$ notation. According to Logic Puzzle 1, each child has only one fruit. There are four children and four fruits. We use uppercase letters N, O, M, and K for Nancy, Olivia, Mario, and Kenji respectively. And $N_{Apple} = 1$ means Nancy has an apple, whereas $N_{Apple} = 0$ means Nancy does not have an Apple. Furthermore, $N_{Apple} + N_{Banana} = 0$ means Nancy has *neither* an Apple *nor* a Banana (notation for "neither" and "nor"). Similarly, $N_{Orange} + N_{Peach} = 1$ means Nancy has *either* an Orange *or* a Peach (notation for "either" and "or"). Similarly, $N_{Apple} + N_{Banana} + N_{Orange} + N_{Peach} = 1$ (note that it cannot be any other value except 1 since Nancy must have one and <u>only</u> one of these fruits in her bag). Also, $N_{Apple} + O_{Apple} + M_{Apple} + K_{Apple} = 1$ (note that it cannot be any other value except 1 since only one of these children can have an Apple). It is interesting to note that it is quite possible for $N_{Apple} + O_{Banana} + M_{Orange} + K_{Peach}$ to be either **0 or 1 or 2 or 4**. It can be 0 because none of these children may be carrying the fruit linked to them in this equation i.e., Nancy may not be carrying an Apple, Olivia may not be carrying a Banana, Mario may not be carrying an Orange, and Kenji may not be carrying a Peach. Note that $N_{Apple} + O_{Banana} + M_{Orange} + K_{Peach} \neq 3$ because if three of the children are carrying the fruit linked to them in this equation, then the 4th child will automatically carry the fruit linked to her in this equation and that would result in a value of 4.

Solution to Puzzle 1 using 0-1 notation: We now proceed with the solution using the "neither" and "nor" notation.
Statement 1 means that $M_{Peach} + M_{Banana} = 0$. This is equivalent to a "neither" and "nor" statement.
Statement 2 means $O_{Apple} + M_{Apple} = 0$.
Thus, $M_{Peach} + M_{Banana} + M_{Apple} = 0$ ➔ $M_{Orange} = 1$ resulting in our first conclusion that **Mario has an Orange**.
Statement 3 means $K_{Banana} + N_{Banana} = 0$. And we already know from Statement 1 that $M_{Banana} = 0$. Thus, $O_{Banana} = 1$ resulting in our second conclusion that **Olivia must have a Banana**.
With the above allocations, there are now two fruits remaining i.e., Peach and Apple. And we still do not know what fruits Nancy and Kenji have.
Statement 4 means $N_{Peach} = 0$ ➔ $N_{Apple} = 1$ resulting in our third conclusion that **Nancy has an Apple**. Lastly, **Kenji has a peach**. Thus, $N_{Apple} = 1$; $O_{Banana} = 1$; $M_{Orange} = 1$; and $K_{Peach} = 1$.

Logic Puzzle 2

Mr. Guthrie (G), Mrs. Hakoi (H), Mr. Mirza (M), and Mrs. Riva (R) have jobs of doctor (Doc), accountant (Acct), teacher (Teach), and office manager (OM). Use the following five clues to determine who has which job.
1. Mr. Mirza lives near the doctor and the teacher.
2. Mrs. Riva is neither a doctor nor an office manager.
3. Mrs. Hakoi is neither an accountant nor an office manager.
4. Mr. Guthrie went to lunch with the doctor.
5. Mrs. Riva's son is a high school student and is only seven year's younger than his teacher.

Solution to Logic Puzzle 2 using 0-1 notation: We solve this puzzle using the "either" and "or" notation.
Statement 1 <u>implies</u> that $M_{OM} + M_{Acct} = 1$. In other words, Mirza is *either* an Office Manager *or* an Accountant.
Statement 2 <u>implies</u> that $R_{Teach} + R_{Acct} = 1$. That is, Riva is *either* a Teacher *or* an Accountant.
Statement 3 <u>implies</u> that $H_{Doc} + H_{Teach} = 1$. This means Hakoi is *either* a Doctor *or* a Teacher.

Statement 4 means $G_{Doc} = 0$ i.e., Guthrie is <u>not</u> a Doctor. Based on Statements 1 and 2, we know that Mirza and Riva are not doctors either. This means $H_{Doc} = 1$ resulting in our first conclusion that **Hakoi is a Doctor**.

Statement 5 means that $R_{Teach} = 0$. And incorporating Statement 5 into Statement 2 would mean $R_{Acct} = 1$ resulting in our second conclusion **Riva is an Accountant**. And incorporating the fact that Riva is an Accountant into Statement 1 means $M_{Acct} = 0$ ➔ $M_{OM} = 1$ resulting in our third conclusion that **Mirza is an Office Manager**. Lastly, **Guthrie is the teacher**. Thus, $G_{Teacher} = 1$; $H_{Doctor} = 1$; $M_{Office\ Manager} = 1$; and $R_{Accountant} = 1$.

Logic Puzzle 3

Yvette (Y), Lana (L), Boris (B), and Scott (S) are college students with each of them having a dog. The breeds are collie, beagle, poodle, and terrier. Use the following information to determine which student has what breed of dog.

1. Yvette and Boris walked to the library with the student who has a collie.
2. Boris does not have a poodle or terrier.
3. Scott does not have a collie.
4. Yvette is in math class with the student who has a terrier.

Solution to Logic Puzzle 3 using 0-1 notation: We solve this puzzle using the "neither" and "nor" notation.

Statement 1 means $Y_{Collie} + B_{Collie} = 0$. In other words, neither Yvette nor Boris has a Collie.

Statement 2 means $B_{Poodle} + B_{Terrier} = 0$ i.e., Boris has *neither* a Poodle *nor* a Terrier. From Statement 1, we also know that Boris does not have a Collie either. Thus, $B_{Beagle} = 1$ resulting in our first conclusion that **Boris has a Beagle**.

Statement 3 means $S_{Collie} = 0$. From Statement 1, we already know that Yvette and Boris do not have a Collie either. Hence, $L_{Collie} = 1$ resulting in our second conclusion that **Lana must have the Collie**.

Statement 4 means $Y_{Terrier} = 0$. We already know $B_{Beagle} = 1$ and $L_{Collie} = 1$. And since $Y_{Terrier} = 0$, we know $Y_{Poodle} = 1$ resulting in our third conclusion that **Yvette has the Poodle**. Thus, it is easy to make the final conclusion that **Scott has the Terrier**. Thus, $Y_{Poodle} = 1$; $L_{Collie} = 1$; $B_{Beagle} = 1$; and $S_{Terrier} = 1$.

CONCLUDING REMARKS

The purpose of this paper was to introduce the students to binary or $0 - 1$ algebraic formulation with the help of some interesting Logic puzzles. Such formulation of problems is essential in solving various IP problems. Although these puzzles can be solved without any algebraic formulation, they lend themselves to the $0 - 1$ notation and due to the simplicity of these puzzles, they provide an excellent start to topics such as Integer Programming. Solving these puzzles helped our student build their confidence when it came to algebraic formulation. The students were more engaged and better equipped when formulating the more challenging problems in topics such as Integer Programming and Linear Programming.

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APPENDIX – A: Here, we solve **Logic Puzzle 1** using the non-notational method.

Nancy, Olivia, Mario, and Kenji each have one piece of fruit in their school lunch. They have a peach, an orange, a banana, and an apple. Use the following <u>four statements</u>/clues to help you determine which person has which fruit. (1) Mario does not have a peach or a banana. (2) Olivia and Mario just came from class with the person who has an apple. (3) Kenji and Nancy are sitting next to the student who has the banana. (4) Nancy does not have a peach.

TABLE 1: Statement 1 by itself

		A	B	C	D
		Peach	Orange	Banana	Apple
1	Nancy				
2	Olivia				
3	Mario	X		X	
4	Kenji				

Note: The two Xs in Table 1 above indicate that Mario neither has a Peach nor a Banana. This is as per Statement 1.

TABLE 2: Statements 1 & 2 combined

		A	B	C	D
		Peach	Orange	Banana	Apple
1	Nancy		X		
2	Olivia		X		X
3	Mario	X	✓	X	X
4	Kenji		X		

Note: The additional Xs above in the column related to Apple (i.e., column D) indicate that neither Olivia nor Mario has an Apple. Since the row for Mario has three Xs, it is easy to conclude that Mario has an Orange. Hence, we put a check in that cell. And if Mario has an Orange, then no one else can have an Orange and we fill the rest of the column related to Orange (i.e., column B) with Xs.

TABLE 3: Statements 1, 2, and 3 combined

		A	B	C	D
		Peach	Orange	Banana	Apple
1	Nancy		X	X	
2	Olivia	X	X	✓	X
3	Mario	X	✓	X	X
4	Kenji		X	X	

Note: The additional Xs above in column C indicate that neither Kenji nor Nancy has a Banana. Since the column for Banana has three Xs, we conclude that Olivia has a Banana and we put a ✓ in that cell. If Olivia has a Banana, then she cannot have a Peach. So, we put an X in that cell since there can only be one ✓ in any given row or column.

TABLE 4: Statements 1, 2, 3, and 4 combined

			A	B	C	D
			Peach	Orange	Banana	Apple
1	Nancy		X	X	X	✓
2	Olivia		X	X	✓	X
3	Mario		X	✓	X	X
4	Kenji		✓	X	X	X

Note: Finally, the 4th Statement is, "Nancy does not have a Peach". This means Nancy has an apple and Kenji has a Peach and we complete Table 4 above with the remaining Xs and ✓s.

APPENDIX – B: Two real-life examples of Integer Programming problems that require $0 – 1$ or binary notation.

Example 1: **The classical knapsack problem** may be defined as follows. Suppose Josie Camper is going on an overnight hike. There are four items Josie is considering taking along on the trip. The weight of each item and the benefit Josie feels she would obtain from each item are listed in the Table below. Also, suppose Josie's knapsack can hold up to 14 lbs. of items.

TABLE 5

	Weight (pounds)	Benefit
Item 1	5	16
Item 2	7	22
Item 3	4	12
Item 4	3	8

For $i = 1, 2, 3, 4$

$$X_i = \begin{cases} 1 \text{ if Josie takes item } i \text{ on the bike} \\ 0 \text{ otherwise} \end{cases}$$

This knapsack problem can be formulated as:

Maximize $Z = 16X_1 + 22X_2 + 12X_3 + 8X_4$

Subject to:

$5X_1 + 7X_2 + 4X_3 + 3X_4 \leq 14$

$X_i = 0$ or 1 ($i = 1, 2, 3, 4$)

Example 2: **The Set-covering problem**

There are six cities (cities $1 – 6$) in Kilroy County. The county must determine where to build fire stations. The county wants to build the least number of fire stations needed to ensure that at least one fire station is within 15 minutes (drive time) of each city. The times (in minutes) required to drive between the cities in Kilroy county are shown in the Table below. Formulate an IP that will tell Kilroy how many fire stations should be built and where they should be located.

TABLE 6: Time required to travel between cities in Kilroy county

FROM	CITY 1	CITY 2	CITY 3	CITY 4	CITY 5	CITY 6
City 1	0	10	20	30	30	20
City 2	10	0	25	35	20	10
City 3	20	25	0	15	30	20
City 4	30	35	15	0	15	25
City 5	30	20	30	15	0	14
City 6	20	10	20	25	14	0

The variables $X_1, X_2, X_3, X_4, X_5,$ and X_6 are defined as:

$$X_i = \begin{cases} 1 \text{ if a fire station is built in city } i \\ 0 \text{ otherwise} \end{cases}$$

Since this is a more challenging problem to formulate, we leave this as an exercise for the students after formulating a few other IP problems that are simpler.

Considerations for the Development of a Fully Online Business Bachelor's Degree Completion Program

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ABSTRACT

Workers are seeking higher-level professional jobs to earn higher wages and salaries. At times, companies of all sizes may not have access to a talent pool that includes candidates with some college degree. Adults who choose to return to school to complete their associate's or bachelor's degree are described as financially independent, have life commitments to family and work, and have other personal identities that do not always include being a student. This paper seeks to help define the process of developing an online degree program for adult students to meet their needs and help higher education serve this non-traditional student population.

Keywords: adult students, virtual education, online learning, post-secondary education

INTRODUCTION

The global economy's demand presents higher education leaders with a problem expanding their student population. Adult students are a non-traditional group of students that may be one of the 80 million people between the ages of 25 and 65 who are high school graduates but do not have a college degree. An additional 15 million people in the US have an associate's degree but have not completed a bachelor's degree (Blumenstyk, 2018). Adult students bring to higher education a set of lifelong learning experiences that may include previous formal education and "life-wide and life-deep learning" (Taylor & Trumpower, 2021, p. 5).

As stated by Blumenstyk (2018), "society is still captivated by the idea that college is for young people" (p.8). Ignoring climate change may be similar to colleges thinking they can still attract traditional high school graduates to meet their recruitment needs. By 2032, there will be a decline in the number of high school graduates; however, the steady decline has already begun more noticeably in the Northeast and Midwest (Blumenstyk, 2018).

Another striking fact reported by the Lumina Foundation is that since 2009, for the ages of individuals ages 25 to 64, only 47 percent have a post-secondary education credential. This statistic may not be for a four-year bachelor's degree since the Georgetown center also noted that associate degrees and certificates are increasing in demand. A job with a salary in the annual range of $40,000 does not typically require a bachelor's degree (Blumenstyk, 2018).

LITERATURE REVIEW

Lifelong Learning as a Framework

Adult literacy can include formal and informal learning settings. Learning outcomes are the knowledge, skills, and competencies attained from learning. Cognitive apprenticeships are designed to give learners the independence of social skills to transfer to the workplace (Taylor & Trumpower, 2021). As Parkinson et al. (2021) suggest, adult students are often more intentional in their pursuit of knowledge that could be based on real-world experiences to transform their thought processes. The learning process is autonomous, self-regulating, and meaningful for adults pursuing their educational goals (Gartner et al., 2022).

Blended learning from the workplace and through formal education includes technology. Adults who have busy lives, either through their employment, family responsibilities, or both, have recognized the need to become more dependent on access to technology to carefully plan their study time management (Jeffries & Hyde, 2010). As time progresses for the adult student pursuing an undergraduate degree, the use of technology and tools is related to more intentional strategies for taking ownership and searching for materials. E-learning takes time (Jeffries & Hyde, 2010). Digital skills for collaborative learning are the foundation of adult student's involvement to increase online participation. Concepts that promote empowerment and skill transfer are a positive learning need. In an online environment for learning, this knowledge may be gained through discussions, learning activities, and reflection (Cerna et al., 2022).

Adult Student Population Demographics

The 2021 Trends in Online Student Demographics Report collected data from 1300 prospective online students, active online students, and alums. Online students were described as: primarily male, between the ages of 25 and 44, a parent, working full time and enrolled full time in their course programs (Venable, 2021). The motivation to enroll is reduced to three student categories (i.e., industry switchers, career accelerators, and career starters). The information categories that prospective students relied on during the program evaluation phase include: talking to students and graduates, printed brochures, social media posts, and student or faculty blogs (Venable, 2021).

Students reported selecting their online degree program based on websites (31%) and student testimonies and reviews (21%). Financial obstacles were a major challenge; however, the student's needs and wants prevailed in making the final decision. Venable (2021) reports that 66% of online students never visited campus.

ONLINE PROGRAM PLANNING AND DESIGN

One initial and primary consideration is for a university to determine if the new program will offer a four-year bachelor's degree or a two-year degree completion program. For this example, the university is part of a state-wide system offering technical college programs, community college two-year associate degree programs, and four-year degree programs. A two-year community college initially designed the online adult student program to create a new student population that could not attend classes on campus. As a result, the two-year community college approached our four-year university to develop a partnership to create a transfer-based curriculum that will leverage a common curriculum design.

Market considerations required evaluating the potential size of the new adult student population to recruit and expand the partnership. The state-wide employment projected job market for 2020 indicated approximately 900,000 job openings requiring a bachelor's degree (K. Richie, personal communication, April 2017). In addition, the two-year associate's adult student 100% online program had achieved an increase in new student enrollment and was reaching the end of the first cohort who was ready to transfer to the four-year university to complete the upper division courses.

Our university leadership determined that a bachelor's degree with a general emphasis on business would be the best opportunity to serve the adult learner population working in various, rather than specific, business disciplines. Therefore, the Bachelor of Business Administration (BBA) program was created as a partnership between the two-year community college and our college and university. Our partnership's task was to create a transfer pathway for the community college's AS in Business students (60 credits) to complete a four-year degree (BBA, 60 credits) for a combined 120 credit hours for graduation (C. Pragman, personal communication, 2018). Typically, our college's Bachelor of Science degree programs specialize in specific business disciplines. However, a BBA degree allowed us to select courses across all business disciplines and include coursework in soft skills such as professionalism, communication, and leadership. Moreover, no other university in our state's higher education system offered a BBA degree, which distinguishes our program from other programs.

Grant Opportunity

Fortunately, our state's higher education system offered collaboration grants to incentivize institutions in the state-wide system to form partnerships and collaborate on developing new student programs. A collaboration grant was applied for and awarded to the community college and our university to develop the BBA transfer pathway. The grant funds were used for early phase program development, and the hiring of permanent staff was delayed for approximately 18 months. During this time, a seven-year program budget was created, and other internal departments were consulted to accommodate the unique requirements of the new 100% online adult student business program. The university expected the BBA program to break even in five years and be profitable within seven years. At the time, there were other adult online programs in other colleges (e.g., nursing, dental hygiene, and applied leadership); however, none of the other programs were accelerated, offering a shorter completion time. Below is the initial BBA program description for our college's partnership with the community college.

Online degree programs fill a gap in offering working adults a viable option to complete a bachelor's degree in five years. For example, if a working adult (without prior coursework) completes one course per semester in a traditional setting, the estimated timeframe to completion would be approximately ten years for an associate's degree. The accelerated program is completely online and offers the non-traditional working adult student the opportunity to complete an associate's degree and a bachelor's degree in five years. The gap is also filled by creating a new student

population for working adults who were not previously able to schedule day or evening courses on either campus. (K. Richie, personal communication, 2018).

Accreditation Approval

There are numerous tasks associated with program approval and accreditation. In our state higher education system, new programs must be approved first at the institution, then by the state higher education system, before being sent to the Higher Learning Commission (HLC) and then to the Department of Education. Even with the cooperation from our university committees and leaders, the BBA took more than a year to navigate the approval process, resulting in more than two years from its inception to admitting students. Moreover, we needed to be mindful of compliance with our college's AACSB Accreditation requirements.

Program Design

The BBA program offers a unique five-week course length so that working adults can take one course at a time instead of multiple semester-long courses. This format is consistent with how courses were offered at the community college, allowing students to complete three courses a semester. The five-week length and the one-course-at-a-time format allow students flexibility. If financial aid is pursued by the student, a minimum of nine credits per semester, or three courses, is required as full-time status for eligibility. Very few of the courses are prerequisites for one another. Therefore, if work or family commitments make it difficult for students to take a course, they can pause their education for a term or two and take a course the next time it is offered. Furthermore, our university's summer courses are five-week sessions, and several courses common to all business programs are offered, giving students an additional opportunity to take a needed course (C. Pragman, personal communication, 2019-2020).

The completion time for the program (including summer terms) was designed to assist the student with a manageable schedule and to complete the BBA within three years (K Richie, personal communication, 2018-19). Each course was designed for the associate's and the bachelor's programs to be a mastery-based, self-paced curriculum, utilizing the release condition features of the learning management system. During the five weeks of each course, the students could be at various stages of the course activities; however, the end date was published for final grades (K. Richie, personal communication, 2018). The above decisions determined the following characteristics of the BBA program.

- A completely online asynchronous program
- One five-week course at a time, a sequential model
- The courses are equivalent to a 16-week semester-long course
- Designed exclusively for working adult learners
- It uses a mastery-based approach and an accelerated format
- Instant advancement for those who show content mastery

Program and Course Outcomes

Before new programs can be offered, our university requires a comprehensive curriculum review process for new programs and new courses within that program. Depending on the individual university requirements, program outcomes and other criteria must be approved by leadership before student recruitment begins. For example, course level outcomes may be required for faculty to include in each new course, especially to recognize diversity and inclusion initiatives. Other prepared documentation may also be an academic map for the program to meet transfer prerequisites and graduation requirements (K. Richie, personal communication, 2019). The university's curriculum review cycle took more than six months, with the following business-related course offerings and the academic map being approved. In addition, ten credits of general education courses needed to be completed by BBA students to meet the 60-credit degree requirement. The courses designated as FINA, IBUS, MGMT, and MRKT are also in our college's bachelor of science (BS) programs.

Spring Year 1

MGMT 346	Production and Operations Management	3
FINA 362	Business Finance	3
IBUS 380	Principles of International Business	3

Summer Year 1

MRKT 318	Integrated Marketing Communications	3
GEOG 101	Science - Introduction Physical Geography	3

Fall Year 1

FIN 375	Data Analytics	3
MGMT 340	Human Resource Management	3
PHIL 224W	Business Ethics - Meets Writing Intensive Requirements	3

Spring Year 2

MGMT 380	Human Behavior in Organizations	3
BLAW 452	Employment and Labor Law	3
CMST 412	Organizational Communication	4

Summer Year 2

MGMT 300	Management Information Systems	3
MGMT 484	Leadership	3

Fall Year Year 2

MGMT 481	Business Policy and Strategy	3
CMST 445	Conflict Management	4
BUS 491	BBA Capstone I	1

Spring Year 3

BUS 492	BBA Capstone II	2

FACULTY CONSIDERATIONS

The BBA program utilizes the existing College of Business faculty since AACSB accreditation requirements do not allow more than 30% use of adjuncts. In addition, given the five-week course length, only adjuncts already familiar with the learning management system are best qualified to teach the sequential curriculum. Therefore, the Collaboration Grant funds initially provided two days of faculty training.

New courses (e.g., BBA Capstone) are designed to be taught by multiple faculty depending on program needs and availability. No College of Business (COB) faculty teaches exclusively in the BBA program. On an ongoing basis, the College of Business offers online courses; however, all BS majors take semester-long, 16-week courses. The summer is the only exception where both BS and BBA students have the option to take 100% online courses for a five-week term. One consistent rule for registration is to reserve course sections for BBA students online to preserve the course sequencing. Other COB students pursuing a BS degree are not permitted to take a BBA course.

Scheduling BBA courses for COB faculty may be challenging to balance the course load for each semester because faculty also teach 16-week courses (K. Richie, personal communication, 2020). Moreover, the upper division courses require faculty to meet AACSB and HLC accreditation requirements for teaching upper-level business courses, which sometimes makes it difficult to find qualified adjuncts.
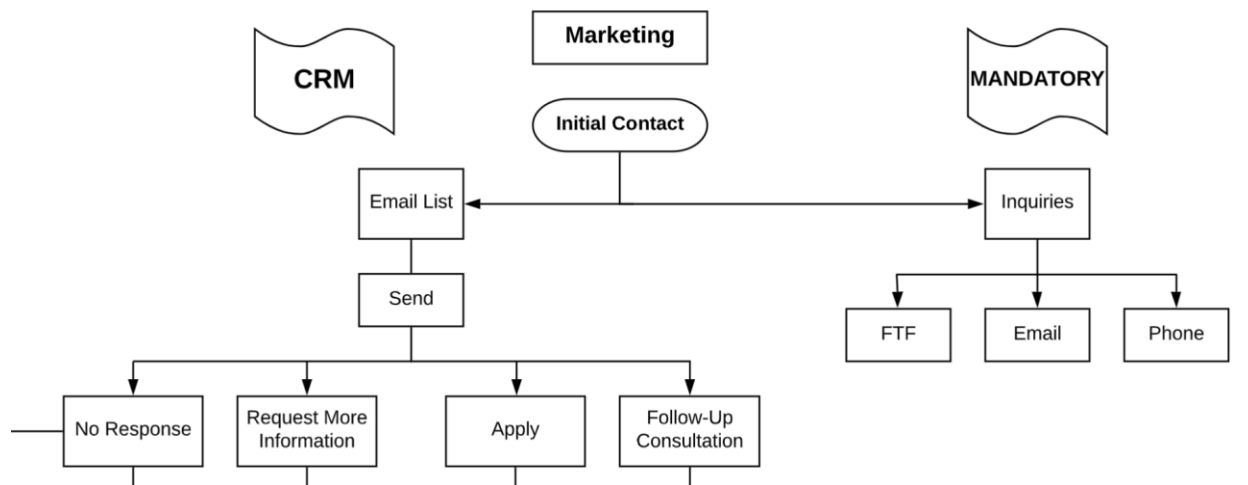
Capacity for the faculty ratio to students enrolled per course is another priority. Teaching 40 students for a five-week course is rigorous. The program budget needs are evaluated to proactively hire dedicated faculty for the BBA program to meet increased enrollment. An ongoing group of staff and faculty meet as a BBA workgroup to discuss alternatives for all program issues, curriculum, and marketing. This core group prepares the plan and written documentation if an accreditation visit is scheduled or a university program requirement is indicated. This BBA workgroup has also written formal job descriptions for an advisor/recruiter position (K. Richie, personal communication, 2020).

PROGRAM MARKETING AND RECRUITMENT

Digital marketing for the BBA program is facilitated by the COB Marketing Director and designated faculty BBA Director. Social media is used for targeted audiences, mostly for university stop-out students who did not complete their degrees in earlier years. In addition, digital marketing materials are prepared to forward following personal one-to-one Zoom sessions with prospective students.

The BBA program website has been designed and frequently updated. It is well known from student feedback that existing and prospective students rely on access to this information to answer questions related to their needs as adult students. As students graduate, testimonies have added value, in addition to leadership videos endorsing the program features. A question-and-answer section on the program website is also available for common inquiries. The web-based digital marketing options are reinforced with outreach from a live conversation with the BBA program recruiter (K.Richie. personal communication, 2021).

The following is a sample flowchart (partial section) for the BBA recruitment process:

Prospective Student Tracking
An automated Customer Relationship Management (CRM) system is ideal for optimum tracking of students at the program level in the recruitment stages. When it is impossible to use a comprehensive CRM, spreadsheets can also be used while working with admissions staff to coordinate the application process. Funnel tracking categories include: inquiry, applicant, accepted, enrolled, withdrawn, and denied. Admissions may provide student application data, but the integrity of this as a sole source of information is not always true. For example, the COB has a Student Center where students may inquire about the program and are already admitted to the university with a different major.

Customized Student Needs
When working with prospective adult students, communication with a quick turnaround for inquiries is critical. The goal is to respond within a business day with an email or phone call from the BBA recruiter. A Zoom call is ideal to discuss the student's needs to prepare a customized degree plan based on their existing courses previously completed. There may be transfer obstacles to overcome and create a plan for meeting the course prerequisites. Regular communication is key to following up during the decision process (K.Richie, personal communication, 2021). Sample written communication templates are recommended for email follow-up, program acceptance, updated degree plans, advising, and graduation.

Employer Tuition Benefits

The tuition benefit programs offered by employers (e.g., McDonald's, Target, Federated Insurance) are another excellent student recruitment strategy. Developing ongoing relationships with the human resource department is a worthwhile investment for adult students working full-time who want to advance their careers. Each employer program has different criteria for reimbursement that can influence financial aid. Scheduling lunch sessions offsite is a good alternative for group information sessions to develop partnerships. Over time, creating cohorts of students from one employer creates a mutual benefit for the community.

Virtual Open House

A virtual open house for prospective students may be ideal to schedule as part of the two-year college partnership. Representatives from both institutions can be present to answer questions and present the program requirements. In addition, optional speakers can be the College Dean to attract interest and communicate the importance of the program to the college and the university (K.Richie, personal communication, 2021).

NEW STUDENT ORIENTATION

Welcoming new adult students at the beginning of the BBA semester is critical. Engagement is a priority for retention, especially since the student ages may span between 23-50. The goal is for each student to feel valued for their education goals. The successful agenda format has been to develop a detailed slide set with program expectations. Another session component is to present the university's online resources, such as registration, library accessibility, financial aid, student clubs that meet on Zoom, or sporting events if the campus is nearby. A suggested closing statement recognizes that the BBA program is 100% online; however, they may never need to come to campus except for commencement!

Growing Enrollment

Program growth is a steady goal year-round, with start dates typically in the fall and spring. Tracking for registration and high enrollment for BBA courses is mandatory for advanced staffing needs. The hiring process can be time-consuming and indicates faculty volunteers to lead the selection process (K.Richie, personal communication, 2021).

RESPONDING TO CHALLENGES

With experience come success and failure and the realization that changes to the original program design are necessary. The BBA program is four years old and has experienced some growing pains. However, the program is successful, and enrollment is trending above expectations. Growth is a good thing but managing it can present challenges. Growth has spurred change in three areas: how we recruit BBA students, teach the courses, and work with the university's infrastructure (C. Pragman, personal communication, 2022).

Changing Recruitment Strategies

Our college began the BBA program with a community college partner already offering an associate's degree with five-week terms and classes taken one at a time. By borrowing that school's playbook, we made it easier for students to transfer to our program to complete a bachelor's degree. However, those transfers failed to materialize because the graduates wanted to pause their education or choose degree completion programs at other private or for-profit institutions. This unexpected enrollment loss caused us to realize that our tuition rates and AACSB accreditation were insufficient to guarantee enrollment. Having realized that we could no longer rely solely on our original community college partner, our BBA recruiter/advisor began recruiting from other state two-year colleges that offered an AS in Business degree. These new relationships have been successful in recruiting students into the BBA program.

Furthermore, we have relaxed the requirement that a student complete an AS in Business before admission to the BBA program. As a result, many students who previously stopped out have enrolled in the program. If a student does not have the necessary prerequisites, our recruiter/advisor creates a personalized academic plan to complete before they can enroll in the BBA courses. Unfortunately, those required courses are often regular 16-week courses, which means the student may take longer to finish the BBA degree. In some cases, if the student needs more than a few prerequisite courses, the advisor will recommend that the student first complete an AS in Business at one of the community colleges. Often that recommendation directs students back to our original partner because that college offers a similar short-term course schedule.

Finally, the COVID-19 pandemic provided an unexpected recruitment opportunity. When our campus closed in March 2020, students moved away and studied remotely. However, once the university reopened and resumed offering classes on campus, many students did not want to leave their full-time jobs and move back to campus. Instead, they wanted to continue to enroll in online courses. Unfortunately, none of our BS programs are online. As a result, many students enrolled in the BBA program. Even though they were younger than the other BBA students, they met the criteria of working adults (C.Pragman, personal communication, 2022).

Course Policy Changes
As the BBA program has grown, the class sizes have increased from an average of 15 to 40 or more students. As a result, some of the original instructional policies became untenable, and the BBA faculty made policy changes to manage the problems they were experiencing. Without these changes, individual students negotiated with individual faculty and commented on the "fairness" of one faculty member's policies over another.

For example, BBA courses are no longer self-paced because self-pacing has the unintended consequence of students not finishing a course on time. Too many students were asking faculty for extensions, which meant they were not ready to start the next term's course. Individual assignments now have firm due dates, and students must finish the course by the end of the term. However, students can still work ahead if they finish their assignments early. As a result, some highly motivated students complete a BBA course in three to four weeks rather than the full five weeks.

Faculty are expected to respond to students' questions promptly and be available or hold office hours after 5:00 p.m. on weekdays and respond on weekends (C.Pragman, personal communication, 2021). Previously, BBA students reported that faculty only held office hours during the regular workday and might not respond to emails for a day or more. Students cannot finish their assignments on time if they cannot get answers to their questions. If students take a course in a compressed time, the faculty must be more responsive.

Another change is asking faculty to organize their course materials similarly in our learning management system. About two years ago, our college had one of the university's instructional designers create a COB-branded template to use in our learning management system. The goal was to have COB courses "look" the same and make it easier for students to understand how to navigate the course. This change has been especially beneficial for BBA students because they begin a new course every five weeks. BBA students have to hit the ground running if they are going to succeed. They do not have time to unravel how to find their assignments and complete them on time (C.Pragman, personal communication, 2021).

Infrastructure
With the growth of our BBA program, plus the overall growth of other online programs, our university has invested in infrastructure for its 100% online programs. A Director of Online Learning was hired; he and his support staff (marketing, accounting, recruitment, etc.) report to the Dean of Extended Campus, who oversees online education and our satellite campuses. This new division monitors our budget and supports many of our marketing needs. This change allowed the COB leadership and faculty to focus on managing and improving the BBA program. However, the university's services come at a cost and are paid for by taxing our tuition revenue. Yet, our growth has allowed us to become profitable in less than five years, rather than the seven years originally required. With those profits, we have hired two additional faculty members who teach courses in the BBA and BS programs (C.Pragman, personal communication, 2022).

CONCLUSION

The first phase of the BBA program was approximately 18 months to submit applications and receive approvals from accreditation organizations and the Department of Education for the new program development. Planning for on-campus functions such as admissions, registration, financial aid, and student advising precipitated a cultural shift on campus to adult students and online programs.

The second phase was the course design and faculty training segment, which lasted six to twelve months. During this phase, an Adult Learner workgroup was formed to bring together different perspectives of faculty and staff for recruitment and hiring. Again, conferences were attended, and various higher education organizations approved presentations.

The third phase was the student marketing and recruitment phase. Brand assets were created, and the IT department created the program website. An advisor/recruiter was hired to work with the two-year community college to facilitate an ongoing working relationship. Live sessions were scheduled at the two-year campus to begin the transfer application process.

The fourth ongoing phase is the expansion phase for the growth of the 100% adult student online program. Although, over time, changes to the curriculum have been made, and the BBA courses are no longer self-paced. Instead, students must meet due dates for their assignments. Although however, they can begin the next series of assignments early if they finish their work early. The current policy is that students cannot fall behind but can work ahead on assignments. Faculty preferred this policy change because it was difficult to adapt to the differences in assignment release conditions, and students were not finishing a five-week course before starting the next one. Staffing for multiple sections of BBA courses with adjuncts is another active review for the workgroup because one section of some BBA courses is no longer enough to meet program needs. (K. Richie, personal communication, 2022).

In the future, the college leadership and BBA faculty expect to accommodate more change. However, we are gratified that the program we envisioned is functioning well. Our College of Business is meeting the needs of our state's higher education system, students, and employers. It is never easy for adults with full-time jobs, families, and other obligations to commit to furthering their education, but the BBA program makes it less difficult for its students. Being 100% online and asynchronous and taking only one course at a time in a five-week session is a successful model. Furthermore, now that the program is established, we are admitting students year-round, and if they have to stop for a period, they can reenter the program in a later term (C.Pragman, personal communication, 2022).

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An Experimental Study of the Effectiveness of Group Quiz in an Operations Management Course

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ABSTRACT

This study investigates the effectiveness of group quiz in improving students' learning performances in an operations management (OM) course. The sample included 120 students who took the undergraduate OM course in a small liberal arts university. There were two groups of students in this study. The first group took a group quiz following an individual quiz, whereas the second group took only an individual quiz. Following the individual quiz, students in the first group were given an identical copy of the quiz again and completed it as a group. During the group quiz, students went through a process of explaining and defending their ideas, understanding different perspectives, and reaching consensus. The empirical results show that the exam scores for the group who participated in the group quizzes were significantly higher than the exam scores for the other group. It indicates that the use of group quiz was effective in improving students' learning performances. The results can be attributed to the benefits of collaborative learning, reciprocal teaching, and quiz re-takes. Students' feedback supports these findings.

Keywords: group quiz, collaborative learning, operations management

INTRODUCTION

Most business schools offer an undergraduate operations management (OM) course describing the function that plans, organizes, controls, and directs manufacturing and production processes and service delivery. As OM is an essential function for most industries, OM is often one of the core courses in the undergraduate and graduate curricula.

In general, an OM course involves the use of mathematical/quantitative tools and models for many major concepts of the subject. Those tools are used to help the operations managers to make the most effective and efficient decisions to deal with day-to-day issues in operations. Therefore, typically, basic mathematics courses (e.g., calculus, algebra) and an introductory statistics course are required as a prerequisite for an OM course at both undergraduate and graduate levels.

To assess students' understanding of OM course material, faculties often use written exams and quizzes. Both exams and quizzes usually consist of conceptual or nonquantitative questions and mathematical or quantitative questions. For example, there can be a question about the difference between vertical integration and horizontal integration, which is an example of a conceptual question. Another question can be about calculating an Economic Order Quantity (EOQ) with given information which is a good example of a quantitative question. Both types of questions are equally important for determining students' level of understanding.

Faculty members who teach an OM course take pains to develop a plan to help their students understand class materials well. Many business students find it difficult to comprehend mathematical and quantitative approaches. On the other hand, some students are good at working with numbers but have trouble understanding conceptual or qualitative materials. As an OM course offers a mixture of both types of content, it is the faculty's responsibility to come up with a method to effectively deliver them to students.

One way to enhance students' learning for an OM course is to put them in a group and let them collaborate for a common achievement. Group learning in business education is known to have a positive influence on learning and performance in marketing, accounting, and management courses (Deeter-Schmelz & Ramsey, 1998). I adopted an in-class group quiz as one of the group learning activities for the OM course I teach. My expectation of the adoption of group quiz was that it would improve students' learning experience with group work, so it would lead to an improvement in performance.

The aim of this paper is to investigate the effectiveness of group quiz in enhancing students' learning and performance in an OM course. There is very little literature on the group quiz as a learning aid in an OM course. This study contributes to the literature by providing the design of the group quiz process and how it can improve students' learning performances.

The following sections of the paper explain how the group quiz was set up and used, the results from the empirical analysis, and a discussion of the findings and the conclusions.

RESEARCH DESIGN

The objective of this study is to find out whether group quiz is effective in improving students' learning performances. Students' learning performances are measured by exam scores.

Subjects

The subjects were students enrolled in the "Production/Operations Management" course at Texas Wesleyan University. The course is offered every Fall and Spring semester as a face-to-face class. Because of the COVID-19 pandemic, the class was offered as an online course from the Spring 2020 semester through the Fall 2021 semester. The sample includes 120 students from eight semesters.

Group Quiz Design

Each quiz consisted of both conceptual questions and quantitative questions. The total number of questions in each quiz was ten, and all were multiple-choice-type questions.

First, a copy of the quiz was distributed to each student, and students completed the quiz within 15 minutes. The instructor collected the completed individual quizzes and asked students to sit with their groups. The instructor gave each group the same copy of the quiz and asked them to complete the quiz as a group. Students had another 15 minutes to complete the quiz together. Students were free to discuss the quiz questions with other students in the same group. The total quiz score was the sum of the individual quiz score and the group quiz score. There were two quizzes before the midterm exam and another two before the final exam.

Because of the COVID-19 pandemic, the modality of instruction was switched to online from the Spring 2020 semester through the Fall 2021 semester. During this time, students were not able to take group quizzes. In the Spring 2022 semester, the university resumed the regular face-to-face classes, but students still took only individual quizzes to maintain social distancing. Table 1 shows the number of students in class each semester, and Table 2 provides the average quiz scores and average exam scores in percentages each semester.

Table 1: Enrollment per Semester

Semester	Instruction Modality	Group Quiz	Number of Students
Fall 2018	Face-to-Face	Yes	18
Spring 2019	Face-to-Face	Yes	12
Fall 2019	Face-to-Face	Yes	15
Spring 2020	Online	No	13
Fall 2020	Online	No	22
Spring 2021	Online	No	9
Fall 2021	Online	No	18
Spring 2022	Face-to-Face	Yes	13
Total			120

Table 2: Average Quiz Scores and Average Exam Scores per Semester

Semester	Average Quiz Score (%)	Average Exam Score (%)
Fall 2018	71.6	75.5
Spring 2019	72.1	76.7
Fall 2019	71.8	78.1
Spring 2020	67.3	70.3
Fall 2020	65.2	71.5
Spring 2021	66.8	68.9
Fall 2021	68.2	69.7
Spring 2022	71.1	70.1

ANALYSIS AND RESULTS

The sample was divided into two groups: (1) with group quiz and (2) without group quiz. The first group included the quiz scores and the exam scores from the Fall 2018 semester through the Fall 2019 semester. The without group quiz results show the quiz and exam scores from the remaining semesters.

In order to test the effectiveness of the group quiz, a Paired Sample T-test was performed to compare the mean differences between the two groups. Table 3 shows the mean differences in quiz scores between the two groups.

Table 3: Differences between the quiz scores in two groups

Paired samples statistics	Mean	Std. deviation	Std.error mean
With group quiz	71.83	0.2517	0.1453
Without group quiz	66.43	1.097	0.6333
Paired samples correlations		Correlation	Sig.
With group quiz			
Without group quiz		-0.984	0.114
Paired samples test	Mean difference	t	Sig. (2-tailed)
With group quiz			
Without group quiz	5.4	6.952	0.02**

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

The results show that the first group (with group quiz) had the higher mean quiz scores, and there was a statistically significant difference in the mean quiz scores between the two groups (p-value < 0.05). This result is not surprising as the students who did not participate in group quizzes were given only one chance to take the quiz individually. Most of the time, the average group quiz scores were higher than the average individual quiz scores. Table 4 shows the mean differences in exam scores between the two groups.

Table 4: Differences between the exam scores in two groups

Paired samples statistics	Mean	Std. deviation	Std.error mean
With group quiz	76.77	1.3013	0.7513
Without group quiz	70.23	1.3013	0.7513
Paired samples correlations		Correlation	Sig.
With group quiz		-0.575	0.61
Without group quiz			
Paired samples test	Mean difference	t	Sig. (2-tailed)
With group quiz	6.53	4.9	0.039**
Without group quiz			

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Again, the first group shows the higher mean exam scores, and there is a statistically significant difference in the mean between the two groups (p-value < 0.05). This indicates that the group that participated in group quizzes performed better in exams.

Table 5: Average Quiz Scores and Average Exam Scores of Two Groups

Semester	Average Quiz Score (%)	Average Exam Score (%)
With group quiz	71.8	76.77
Without group quiz	67.7	70.1

Finally, Table 5 reports the average quiz scores and average exam scores of the two groups. The first group performed about 6% higher on the quizzes and 9.5% higher on the exams.

DISCUSSION

As the results show, the use of the group quiz was effective in improving students' test performances. There are several possible explanations for this result. First, it can be simply one of the functions of the quiz. Quizzes are very commonly used to check the level of understanding of students before exams at the undergraduate level. I purposefully included questions related only to the key points of each chapter covered in classes. This was to help students understand the most important concepts and to provide them with hints for the exams. Therefore, it is logical to assume that the implementation of quizzes, even without considering the effect of collaborative learning, could result in better performances in exams. However, the literature does not provide general agreement with this claim.

Another explanation can be found in the "collaborative learning" part of the group quiz. The purpose of the group quiz is to promote collaborative learning between group members so it can help students learn better. During the group discussion, students go through a process of explaining and defending their own views and trying to reach a consensus by reconciling conflicts. This discussion process serves as a good opportunity to practice collaborative decision-making and problem-solving. Also, for some students, the group discussion is a good opportunity to pick up what they missed during a lecture. There are several studies that report the positive effect of collaborative learning on student learning (Rao, Collins, & DiCarlo, 2002; Ravenscroft et al., 1995; Warburton & Volet, 2013; Yokomoto & Ware, 1997), while other studies do not (Clinton & Kohlmeyer, 2005; Ravenscroft et al., 1997). Therefore, the literature fails to provide consensus. However, most studies agree with the idea that collaborative learning enhances the motivation of students and their active participation in class.

It is possible that the nature of the subject makes the group quiz effective in improving students' learning experiences. A typical undergraduate OM course covers both conceptual or qualitative contents and quantitative or mathematical analyses. However, not all students are proficient in comprehending and digesting both types of content. Some students are more skilled at mathematical approaches, and some other students are more competent in understanding qualitative concepts. Group discussion is a good way to put different types of students together and have them exchange their ideas freely without having to ask questions directly to the instructor, which often leads to reciprocal teaching. This

process generates complementary learning between students, and it is a good addition to the traditional teaching approach. Both my observation during the group discussion and students' feedback support this argument.

Finally, one noteworthy part of the group quiz is the "re-take" process. Students take the same quiz twice; the first take is individual, and the second take is done as a group. Allowing students to repeat quizzes is a common practice in many undergraduate courses. For example, Hite (1996) investigated the effectiveness of re-take in a junior-level tax class. The experimental group took group exams following each of three individual midterm exams, and this group showed superior performances in the final exam compared to the control group that did not take group exams. The process of re-take introduced in this experiment is very similar to the one in this study and the results are also consistent. In my OM course, students did not receive the answers after the first attempt and were given the exact same copy of the quiz for the group task. This process allows students to take more time to review the questions and think about the answers again. Overall, it is assumed that this re-take process allows students to be more familiar with the questions, and the content of the quiz is more likely to stay with them longer.

CONCLUSION

This study investigated the effect of group quiz on improving students' learning performances in an undergraduate OM course. The empirical analysis with the sample of 120 students from eight semesters shows that the exam scores for the group who participated in the group quizzes were significantly higher than the exam scores for the other group. It tells us that the use of group quizzes has a positive impact on students' learning performances. The results can be attributed to several factors: 1) the effect of collaborative learning that promotes students' learning; 2) reciprocal teaching and complementary learning; and 3) the re-take process that helps students be more prepared for the exams. This study contributes to the literature by providing the design of the group quiz process and how it can improve students' learning performances.

One major limitation of this study was the sample size. Although the sample was collected over several semesters, the class size (usually less than 30) was smaller than that of many other peer institutions. A longer timeframe for the data collection or co-working with other instructors from different sizes of institutions could validate the findings from this study.

In this study, I focused on the students' performances as the left-hand side of the equation. Further research should be undertaken to investigate the potential impact of group quiz on students' motivation to learn, perceptions of the subject, and retention rate. Furthermore, variations in the format of the group quiz and the impact of these variations would make a valuable contribution to the literature.

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Hierarchy of Group Factors Affecting Students' Selection of Online Classes: New Evidence from Hierarchical Regression Analyses

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ABSTRACT

This study examines the students' behavior of selecting online classes. More specifically, this study examines three related issues to online classes, the factors affecting students' selection, the hierarchy among factors, and the tendencies developed over the past twenty years, 2003-2022. By using hierarchical linear regression analyses, this study evaluates the relative importance of factors affecting students' selection of online classes. This study documents that barriers are still the most crucial factor. This study also finds that the motivators of online learning are the next most important, followed by the students' individual characteristics, and their learning styles. By splitting the sample into four sub-periods, this study documents a shift (or change) in the roles played by each of these factors. While the barriers and motivators are the two most influential factors across all time periods, the individual characteristics and learning styles play a marginal role compared to other factors, but the latter factors did play more significant roles in the late 2000s and early 2010s when online learning became popular.

Keywords: online learning, class delivery mode, motivators, barriers, business education, hierarchical regression.

INTRODUCTION

This study examines the hierarchy of multiple factors affecting the students' selection of online class over its alternative, face-to-face (F2F) learning. Over the past several decades, online learning increasingly has gained popularity and has become a new paradigm in higher education (Allen, et al., 2016; Kaplan & Haenlein, 2016; O'Neill et al., 2021). Extant literature identified multiple factors affecting students' class selection behavior, such as the barriers of F2F class, the motivators of online learning, the learning styles, and the learner-specific characteristics (Kumar, et al., 2017; Palvia et al., 2018). However, little is known about the hierarchy among them. This lack of information about the order of importance of factors provides an impetus for the current study.

The primary objective of this study is threefold. First, this study reevaluates multiple factors affecting the students' selection of online over face-to-face learning with an emphasis on the hierarchy among them. Second, this study examines the changes developed with respect to their relative importance over the period of 2003-2022. Third, this study extends prior studies with improved methodologies in terms of sample size, measurements, research design, and statistical methods.

REVIEW OF PRIOR RESEARCH ON FACTORS AFFECTING ONLINE LEARNING

Barriers to F2F Class
Based on an extensive review of the literature on barriers that prevent students from taking F2F classes, this study grouped them into three types: institutional, scheduling-related, and situational. Institutional barriers (*BAR_INS*) are related to the institutional setting that determines the availability of F2F classes for students regarding term, time block, and campus (Bryant, Kahle, & Schafer, 2005; DeRienzo & Lilly, 2014; Muilenburg & Berge, 2005). In comparison, scheduling barriers (*BAR_SCH*) arise from the conflicts in schedules between class and their work and family, while situational barriers (*BAR_SIT*) are associated with the learner's personal situations such as the physical location of the campus and transportation to and from students' work and home (Mann & Henneberry, 2012).

Motivators of Online Learning
Extant literature identifies a list of motivators that facilitate the selection of online classes in addition to the already recognized barriers (Chang et al., 2014; Fish & Snodgrass, 2015; Kuzma, Kuzma, & Thiewes, 2015; Mann & Henneberry, 2012; Muilenburg & Berge, 2005). By reviewing these motivators, this study groups these motivators into three types: satisfiers of online, dis-satisfiers of F2F, and self-efficacy toward online learning. The satisfiers of online learning (*MOT_SAT*) are attributable to the satisfactory features (or merits) of online learning. In comparison, dis-satisfiers (*MOT_DIS*) are related to the low expectations (or disappointments) on certain attributes of F2F classes. The third type of motivator (*MOT_EFF*), which is new in this study, is the students' self-efficacy on instructional

technologies required for online learning. Different terms are used to refer this variable by researchers, for instance, electronic efficacy, computer self-efficacy, or online learning self-efficacy (Cahoon, 2000; Jan, 2015; Shen et al., 2013).

Students' Learning Styles
Learning styles refer to the proposition that students learn and study in diverse ways. The fundamental idea of learning styles is that everyone has his/her own learning style and that they learn best when information is presented in their style (Chetty et al., 2019; Gholami & Bagheri, 2013; Kolb, 2014). Among various learning styles identified by prior studies, this study uses two learning styles which are relevant to the context of online learning. The VAK sensory styles (*LS_VAK*) classifies learners as being visual, auditory, or kinesthetic based on sensory modalities (Fleming, 2001; Gholami & Bagheri, 2013). Visual learners learn things best if graphics or visual images are given in the learning process. In contrast, auditory learners learn best through hearing (lectures, discussions, tapes, etc.), information rather than seeing it, while kinesthetic learners prefer to learn via experience (moving, touching, and doing, etc.). In comparison, the Kolb's learning style inventory (*LS_KOLB*) looks at how learners perceive (thinking vs. feeling) and process (doing/watching) information (Kolb, 2014; Lu et al., 2007).

Individual Characteristics
Prior studies in the field of education identify several learner-specific individual characteristics as affecting the selection of class delivery modes and learning outcome. They include age, work experiences, language skills, gender, majors, and race (Fish & Snodgrass, 2015; Mann & Henneberry, 2012; O'Neill et al., 2021). Among them, this study first considers the age of student (*IND_AGE*). This study also measures the competency in English (*IND_ENG*), which refers to the written interactions and English proficiency as a key component in the success in online learning (Lapadat, 2002; Martirosyan et al., 2015).

RESEARCH METHODOLOGY

Subjects and Data Collection
This study collected data from students who enrolled in a core graduate course of an MBA program offered at a state university located in the southwest United States. A total of 925 students participated in the survey, which was conducted in the course over a period of 2003-2022. Table 1 shows the distribution of the subjects in terms of the class enrolled and the classed preferred by students over four sub-periods.

The school at which the data were collected began offering online classes from the early 2000s (Period 1 in the study). A vast majority of students preferred and enrolled in F2F over online classes during this period. From the period of late 2000s and early 2010s, a new trend developed. The number of students who enrolled in online classes increased significantly. Also, students who preferred online increased to the level of F2F in both numbers and percentage. Table 1 shows that in Period 4, which is the most recent sub-period, an overwhelming majority of students took online classes rather than F2F classes. One notable development in recent years (Period 4 in the study) is that the school offered more online classes and added hybrid components to the traditional F2F classes. Another notable development, particularly from the early 2020s when the COVID-19 pandemic broke out, is that all the F2F classes were converted to virtual or online classes.

Table 1. Sample Partitioned by Sub-Periods: Class Enrolled vs. Class Preferred

Sub-Periods	Class Enrolled		Class Preferred		All
	F2F	Online	F2F	Online	
Period 1 (2003~2007)	99 (76.7%)	30 (23.3%)	80 (62.0%)	49 (38.0%)	129
Period 2 (2008~2012)	118 (33.3%)	236 (66.7%)	176 (49.7%)	178 (50.3%)	354
Period 3 (2013~2017)	78 (30.8%)	155 (69.2%)	118 (50.6%)	115 (49.4%)	233
Period 4 (2018~2022)	13 (6.2%)	196 (93.8%)	103 (49.3%)	106 (50.7%)	209
Total	308 (32.9%)	617 (67.1%)	477 (51.0%)	448 (49.0%)	925

Measurements of Variables
Dependent variable *(ONPCT)* is the percentage of online classes taken from the total number of classes taken in the program. This is a continuous scale to depict the status of class delivery mode, which is unique to this study. Most

other studies use a dichotomous (nominal) scale (0: F2F vs. 1: online). Independent variables, students' perceptions on various attributes of online learning, are measured using a structured survey that includes a total of 24 items, including 8 barriers and 8 motivators. The 5-item Likert scale is used to measure survey items. This scale ranges from 1 (strongly disagree) to 5 (strongly agree).

This study identifies and measures three types of barriers using the following items: four items (*NA_TERM, NA_TIME, NA_CAMP,* and *NA_FULL*) for institutional barriers; two items (*D2_WORK* and *D2_FAMILY*) for scheduling barriers; and two items (*D2_LOCAT* and *D2_TRANS*) for situational barriers. This study also measures three types of motivators: four items (*ORGANZD, PRINTED, OWNPACE*, and *FDBACK*) for satisfiers of online, two items (*NS_S2I* and *NS_S2S*) for dis-satisfiers against F2F, and two items (*NEWSKILL* and *ITCONF*) for self-efficacy of online learning. For learning styles and individual characteristics, 8 items are used: for students' learning styles, *VAK_V, VAK_A, KOLB_DW* and *KOLB_T/P* are measured. This study employs four items for individual characteristics, *AGE, WORKEXP, NATIVE* and *INUS*.

RESEARCH FINDINGS AND DISCUSSION

Results for Group Factors: Based on Principal Factor Analysis
This study conducts factor analyses based on a VARIMAX rotation method with a common cutoff point of 0.40. As reported in Table 2, this study extracted a total of ten factors via principal factor analyses. This study finds that three barriers are significant, institutional barriers (*BAR_INS*), scheduling barriers (*BAR_SCH*), and situational barriers (*BAR_SIT*). The results from factor analysis confirm *BAR_INS* as the most crucial factor, *BAR_SCH* as the third factor, and *BAR_SIT* as the fifth factor. In addition, three motivators of online learning are identified: satisfiers of online (*MOT_SAT*), dis-satisfiers of F2F (*MOT_DIS*), and self-efficacy toward online learning (*MOT_EFF*).

The results from this study identify *MOT_SAT* as the second factor, *MOT_DIS* as the fourth factor, and *MOT_EFF* as the ninth factor. This result is notable considering that *MOT-DIS* represents the classroom interactions which had been the traditional advantage of F2F over online classes. This study also identifies two learner-specific factors: *IND_AGE* as the sixth, *IND_ENG* as the ninth, *LS_VAK* is the seventh, and *LS_KOLB* as the tenth.

Table 2. Results from Principal Factor Analyses

Name of Factors	Variance Explained	Variables Associated with the Factor			
Factor 1 (*BAR_INS*)	2.465	*NA_TERM*	*NA_CAMP*	*NA_TIME*	*NA_FULL*
Factor 2 (*MOT_SAT*)	2.026	*ORGANZD*	*PRINTED*	*OWNPACE*	*FDBACK*
Factor 3 (*BAR_SCH*)	1.421	*D2_WORK*	*D2_FAMILY*		
Factor 4 (*MOT_DIS*)	1.364	*NS_ST2IN*	*NS_ST2ST*		
Factor 5 (*BAR_SIT*)	1.307	*D2_LOCAT*	*D2_TRANS*		
Factor 6 (*IND_AGE*)	1.243	*AGE*	*WORKEX*		
Factor 7 (*LS_VAK*)	1.017	*LS_V*	*LS_A*		
Factor 8 (*IND_ENG*)	0.964	*NATIVE*	*INUS*		
Factor 9 (*MOT_EFF*)	0.914	*NEWSKILL*	*ITCONFI*		
Factor 10 (*LS_KOLB*)	0.805	*LS_D/W*	*LS_T/F*		

Results for Incremental Effects of Group Factors: Based on Hierarchical Regression Analyses
This study further explores the hierarchy among the group factors by conducting incremental analyses. In the hierarchical regression, we employ a total of four group factors. They are *IND* (individual characteristics), *LS* (learning styles), *MOT* (motivators), and *BAR* (barriers). The incremental analyses start with the group factor *IND* as a basis and adds other group factors to the base model until all four group factors are included. Table 3 summarizes the results from the incremental analyses. The first group factor entered to the hierarchical regression model is *IND*. R^2 of the model was .061, which is statistically significant but weak. The two age-related variables, *AGE* and *WORKEXP*, are not statistically significant, but the two language-related variables, *NATIVE* and *INUS*, are significant at a level of .05 and <.001, respectively. This study confirms that students' language skills have some impact on their choice, which is unique to this study. When the second group factor (*LS)* is added to form the two-factor model (*IND+LS*), the R^2 is increased by .024, but the impacts of the *LS* are weak. When *MOT* is added to form the three-factor model

(*IND+LG+MOT*), the R^2 is increases by .186. The model itself and all three composite measures of the motivating variables are significant at a level of <.001. Finally, when the *BAR* is added in the four-factor model (*IND+LG+MOT+BAR*), the R^2 is increased by .107. The model itself and three composite measures of barriers are significant at a level of <.001, thus supports the hierarchy of the group factors in the order of *BAR*, *MOT*, *IND*, and *LS*.

Table 3. Results on Incremental Effects: Hierarchical Regression (N=925)

Group Factors / Variables	Estimates	T value	Pr|F|	R^2	Δ in R^2	F value	Pr|F|
IND				.061		11.99	<.0001
AGE	1.760	0.930	0.352				
WORKEX	-0.501	-0.270	0.784				
NATIVE	6.252	2.370	0.018				
INUS	10.280	5.450	<.0001				
IND+LS				.085	.024	10.61	<.0001
AGE	1.263	0.670	0.502				
WORKEX	-0.703	-0.390	0.698				
NATIVE	6.166	2.340	0.019				
INUS	9.877	5.270	<.0001				
LS_V	2.075	3.190	0.002				
LS_A	-0.878	-1.110	0.269				
LS_DW	-0.254	-0.870	0.383				
LS_TF	0.291	0.930	0.355				
IND+LS+MOT				.271	.186	30.91	<.0001
AGE	2.244	1.340	0.182				
WORKEX	-0.320	-0.200	0.844				
NATIVE	4.898	2.060	0.040				
INUS	6.662	3.950	<.0001				
LS_V	1.438	2.470	0.014				
LS_A	-1.044	-1.470	0.143				
LS_DW	-0.001	0.000	0.996				
LS_TF	-0.021	-0.070	0.940				
MOT_SAT	8.974	6.490	<.0001				
MOT_DIS	7.225	6.900	<.0001				
MOT_EFF	52.841	3.410	0.001				
IND+LS+MOT+BAR				.378	.107	39.57	<.0001
AGE	2.437	1.570	0.118				
WORKEX	-1.565	-1.040	0.300				
NATIVE	4.384	1.990	0.047				
INUS	5.543	3.530	0.000				
LS_V	1.273	2.360	0.019				
LS_A	-0.620	-0.940	0.349				
LS_DW	-0.122	-0.500	0.614				
LS_TF	0.021	0.080	0.936				
MOT_SAT	4.276	3.170	0.002				
MOT_DIS	5.265	5.360	<.0001				
MOT_EFF	15.351	1.040	0.296				
BAR_SCH	10.613	8.840	<.0001				
BAR_SIT	3.680	4.640	<.0001				
BAR_INS	-5.220	-4.790	<.0001				

Results on Trends Across Time Periods: Hierarchical Regression by Sub-Periods

With the findings on hierarchy, this study further explores the trends developed over the four sub-periods. Table 4 compares the results period-to-period. The order of the contribution made by each factor has not changed much over the examination periods. The results confirm that *BAR* serves as the most significant group factor overall, followed by *MOT, IND,* and *LS*. Such hierarchy remains over the four sub-periods. As shown in Panel A of Table 4, the hierarchy of the single-group-factor-models is in order of *BAR* (R^2=.288), *MOT* (R^2=.228), *IND* (R^2 =.061), and *LS* (R^2=.029). Such a pattern prevails in the multi-group-factor-models as shown in Panel B of Table 4. By comparing period-to-period changes over the group factors, this study finds a minor change. This study confirms that *BAR* serves

a dominant role across all sub-periods, particularly in Period 3, while *MOT* is in its highest point in Periods 2 and 3, the periods in which online learning increased dramatically. This study finds the incremental effects of *LS* in Period 2. The effect of *IND* is at its highest point in Period 2. Its R^2 of .123 is larger than other periods. The relative effects of *MOT* and *BAR* diminish during Period 4 compared to other periods. It is not surprising because hybrid models gained popularity during this period (Castro, 2019; O'Neill et al., 2021). Another explanation is that the distinction between F2F and online disappeared during the COVID 19 pandemic that started in early 2020s (Period 4 in the study) because most of the F2F classes converted to some form of hybrid classes at most schools across countries, including the school in which current research was conducted.

Table 4. Results on Trends: Changes (Δ) in R^2 Across Models and Periods

Group Factors	Period 1 (2003~2007)	Period 2 (2008~2012)	Period 3 (2013~2017)	Period 4 (2018~2022)	All Periods (2003~2022)
Panel A: One Group Factor					
IND					
R^2	.033	**.123**	.054	.070	.061
LS					
R^2	.012	**.097**	.006	.010	.029
MOT					
R^2	.181	**.251**	.235	.184	.228
BAR					
R^2	.206	**.291**	.285	.243	.288
Panel B: Multiple Group Factors					
IND+LS					
+Δ in R^2	+.010	**+.065**	+.003	+.007	+.024
R^2	.043	.188	.057	.077	.085
IND+LS+MOT					
+Δ in R^2	+.176	+.134	**+.219**	+.153	+.186
R^2	.219	.342	.276	.230	.271
IND+LS+MOT+BAR					
+Δ in R^2	+.082	+.102	**+.126**	+.094	+.107
R^2	.301	.444	.402	.324	.378

CONCLUSION

This study, by using principal factor analyses, documents the existence of four primary factors (or groups), even though the effects of IND and LS are not strong. This study, by using and the hierarchical regression analyses, also finds empirical evidence that supports the hierarchy among them in the order of *BAR*, *MOT*, *IND*, and *LS*. One significant contribution of this study based on hierarchical regression with a more refined empirical research design and more robust research methodologies, is that it provides new evidence that supports the hierarchy among multiple factors. This study concludes that the group factor *BAR*, has been the most significant factor in the selection of class delivery modes. This study also finds the significance of all three types of barriers, institutional barriers (*BAR_INS*), scheduling barriers (*BAR_SCH*), and situational barriers (*BAR_SIT*). An implication of such finding is that offering a class delivery mode that mitigates students' barriers and accommodates various needs of students is a challenging task for administrators. As suggested by recent studies, adopting a hybrid model or adding a hybrid component to the F2F classroom (online learning resources) and online classes (virtual F2F components) might be a winning solution because they allow students to utilize advantages of both F2F and online learning in the class.

This study also contributes to the extant literature by providing supporting evidence that motivators (*MOT*) play important roles equivalent to those of barriers (*BAR)* in the students' class selection, which has been documented sparsely in previous literature. Results from hierarchical regression indicate that *MOT* alone explains 22.8% of the total variance, while *BAR* alone explains 28.8%. Among three types of motivators, this study confirms that the satisfiers of online (*MOT_SAT*) are still most significant, which is consistent with prior studies. This study also finds

supporting evidence that the other two motivators, dis-satisfiers of F2F (*MOT_DIS*) and the efficacy of online (*MOT_EFF)*, are as important as *MOT_SAT*, which is unique in this study. One implication is that enhancing authentic interactions in classroom became challenging tasks to instructors, designers, and administrators. Another implication relevant to educators is that they can help students by providing a means to improve their self-efficacies in instructional technologies necessary for the success in online learning.

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Enhancing Oral Communications Outcomes in Business School Students

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ABSTRACT

Oral communication is one of the important competencies business schools develop in their students. As a result of the important nature of this competency, oral communication is often included as a learning goal for a college or university's assurance of learning program, especially for AACSB-accredited institutions. The challenge for higher-education institutions is developing initiatives that can demonstrably enhance student oral communication performance. This paper presents a successful initiative that utilized cross campus collaboration between the School of Business and the coordinator of the College Speech Program. This collaboration integrates a refined oral communications rubric for evaluating students, faculty training for use of the rubric, expert evaluation of sample presentations, and data driven curriculum improvement resulting in enhanced outcomes.

Keywords: oral communication, AASCB, assurance of learning, competencies, learning goals, curriculum improvements, rubric

INTRODUCTION

Recruiters and employers find oral communication to be a vital competency for employees in the workplace. As Costigan and Brink (2020) point out, of the 967 jobs featured in Occupational Information Network, 918 (95%) have oral expression rated as "important to extremely important" for effective job performance. Not surprisingly, the ability to effectively communicate orally is considered one of the most desired traits by recruiters (Brink and Costigan, 2015; Stowe, Parent, Schwartz and Sendall, 2012). More specifically, many employers value "communication skills" more highly over displayed capacities for "teamwork," "technical knowledge," "leadership," and "managerial skills" when hiring recent business graduates at both the undergraduate and graduate levels (Conrad and Newberry, 2012; Lee and Bagwell, 2017).

Considering the demand for effective oral communication skills in today's workplace, college and university business schools include oral communication in their data driven student improvement programs. An analysis of undergraduate program learning goals in AACSB accredited business schools revealed that 85% of executives and hiring managers considered oral communications to be the most important skill (Woodside, 2020).

REVIEW OF LITERATURE

AACSB Expectation for Mission Driven Student Learning Improvement Program

AACSB formulated new business accreditation standards in 2020 which are principles based and outcome focused. Considered a guiding principle in the 2020 Standards is the development of high-quality programs and outcomes for learners that are guided by the school's mission. The Introduction to Standards enumerates that a wide range of institutional mission statements are consistent with the standards and "require the periodic, systemic review and possible revision of the school's mission." The Introduction further expects "engagement of appropriate stakeholders" in the process of evaluating the mission and strategic plan of the school (AACSB, 2022). Standard 1: Strategic Planning, identifies the mission as "a single statement or set of statements" which will guide the school and expected outcomes in providing the distinctive aspects of its expected outcomes, including its data driven student improvement program, referred to as assurance of learning (AACSB, 2022).

Following from the school's mission, Standard 5: Assurance of Learning, provides an expectation for a systematic process that will demonstrate collectively that the school's learners have achieved the competencies established for them. If the expectations have not been met, there should be an identifiable means and expectation for curriculum improvement that both identifies the gaps and provides for the implementation of change. The 2020 Standards also provide for the expectation of direct and indirect measures as a component of the entire assessment processes employed. These measures should be consistent with the mission and strategic plan established for the school.

As part of the Basis for Judgement of the Assurance of Learning Processes in Standard 5, the curriculum should reflect "Currency of knowledge and expectations of stakeholders" in determining what the outcomes should be and when the learners exceed, meet, or fall short of the expectations (2020 Standards p. 45). The stakeholders should include employers and alumni that can be represented by membership in the business advisory council as well as current students. At King's College the mission statement of the William G. McGowan School of Business is as follows:

> *The William G. McGowan School of Business, a business school within a Catholic liberal arts college, is guided by our sponsor, the Congregation of Holy Cross, in pursuing quality education through academic excellence, creative pedagogy, engaged mentorship, co-curricular participation, and a collaborative spirit. We develop career-ready business leaders who are prepared to make ethical business decisions in service of the common good.*

Proceeding from this mission, the stakeholders identified oral communication competency to be a learning outcome, for both graduate and undergraduate learners alike, to achieve and take forward into their careers.

Defining Oral Communications Competency
With the establishment and development of oral communications as a learning competency for students, a clear and functional definition of oral communication is initially important to develop the processes for evaluation. Ames, Maissen, and Brockner (2012) maintain that "oral expression is saying what is right, expressing it well, speaking up, and holding the attention of the listening audience while saying it."

A consideration of the role of communication skills development must rightly begin with a fundamental understanding of "communication" as an observable, expressive process symbolically transacted between people for the sharing of meaning (Osborn et al., 2015). Both practically and historically, oral communication is a multi-faceted construct. For it entails dimensions at once substantive, structural, linguistic, and performance based. And it has been conceived in this manner for literally two and a half millennia.

The Greek Civilization first gave rise to a systematic, coherent approach to oral communication performance, as best articulated by the eminent philosopher-scientist-rhetorician, Aristotle. In *Rhetoric*, he put to paper the seminal treatment of the communication arts in the Western Tradition (Aristotle, 1954; Golden, Berquist and Coleman, 1989). Following in that tradition, renown Roman scholars Cicero and Quintilian further articulated and significantly extended the instructional arts of rhetorical performance, providing the basis for modern applications of these classical tenets (Beebe and Beebe, 2009; Golden, Berquist, and Coleman, 1989; Sproule, 1991; Watson, 1970).

At the core of this classical approach are the Rhetorical Canons underlying the oral performance training and evaluation represented in this research. They are as follows: I. Content ("inventio") the explicit substance and content of a given message (e.g., substantive development of topic, main ideas, subsidiary ideas, supporting evidence, and competent knowledge of research articles and their disciplinary relevance); II. Organization ("dispositio") the way in which the substance and content of the message is structured, organized, and sequenced (e.g., assignment format, message structure, and the timing, sequence, and relationship of ideas including clear message introductions, transitions, and summaries); III. Language ("pronunciatio") linguistic choice and verbiage through which the message content is expressed (e.g., clear, correct, concise, concrete, and creative phraseology, as well as use of industry appropriate terminology); IV. Delivery ("elocutio") the manner in which the verbiage of the message is executed through demonstrable aspects of vocal and non-vocal expressiveness (e.g., vocalized aspects of volume, tone, rate, articulation and pronunciation; non-vocal aspects of eye contact, facial expression, gesture, posture, and broad physical movement, as well as effective execution of performance aids); and V. Presence ("memoria") how the speaker recalls and executes the prepared message, include the explicit method utilized for assuring faithful execution of the verbiage of the message as planned (e.g., demonstrating preparedness, confidence, poise, energy, enthusiasm, and overall professional presence). (Aristotle, 1954: Beebe and Beebe, 2009: Cicero, 1959; Golden, Berquist, and Coleman, 1989: Sproule, 1991; Watson, 1970).

So, the issue then is not about "Whether oral communication skills should be taught," but rather, "How to teach them effectively (Lee and Bagwell, 2017)?" For example, Lee and Bagwell (2017) successfully used interactive exercises in every class meeting to provide opportunities for students to engage in speaking, listening, and story-telling skills. Kerby and Romine (2009) created an oral communication development plan across three courses utilizing the same rubric to develop students' competencies in this area. Costigan and Brink (2020) used a leaderless group discussion and a presentation with Q&A to significantly improve students' oral communication and listening skills.

In this research, a consultant from outside the Business School, an expert in oral communication performance and evaluation, created a more pointed rubric (Appendix A) with definitions and guidance for its users to assess basic oral presentation competency development within the student population. To this end, a detailed delineation of the classical canons in rubric format was developed, beneath the conventional 4.0 assessment scale. In this manner, student performance competencies were both granularly and wholistically evaluated along classical lines, and specifically scored in familiar contemporary feedback measures. The results would provide measures to be evaluated against benchmarks for each canon on an individual student basis as well as wholistically amongst student populations.

Scholars have highlighted the efficacy of implementation of the classical canons in oral performance training (Golden et al., 1989; Phillips, 1991). A sampling of basic collegiate oral communication textbooks also provides testimony to the effectiveness of oral presentation skill set training structured along such classical dictates (Lucas, 2015; Osborn et al., 2015; Sproule, 1991).

HYPOTHESIS

The development, implementation, and use of an oral communications rubric targeted to evaluate the undergraduate and graduate student learning outcomes which incorporates the five classical canons of oral communication training will improve student learning outcomes.

METHODS

As part of our Data Driven Student Improvement Program, oral communication is one of the student learning competencies. To create a quality assessment plan for this competency, the business school partnered with a Professor of Speech and Coordinator of the King's College Speech Program in a cross-campus collaboration to both develop an assessment instrument, train faculty, and evaluate outcomes. This collaboration resulted in the development of an oral communication assessment rubric based on the historically accepted five canons of oral communication: "content," "organization," "language," "delivery," and "memory (presence)." This instrument has been routinely utilized in various business school courses, the college's liberal arts core curriculum, as well as various majors outside the business school. In addition to utilizing the rubric, the business school engaged the professor as an expert to train faculty in the specific application of the instrument to business school disciplines, and to evaluate oral communication outcomes within the graduate Health Care Administration (HCA) master's program. As a non-teaching evaluator, the professor represents an appropriate means through which to provide an objective and valid assessment of the learners' oral communication abilities.

Data Collection

Initially, the first assessment of a random sample of oral communication presentations was executed in the HCA capstone course (HCA 598) in 2016. The established benchmark for student outcomes is for students to achieve a rating of 3 out of 4 on each canon within the established oral communication rubric. The benchmark further establishes a "meets expectation level" when at least 80% of the students meet this standard. As evidenced in the table below, the students did not meet the established benchmark on any of the five canons in 2016-17.

Table 1: Academic Year Outcomes for 2016-17

	Canon 1	Canon 2	Canon 3	Canon 4	Canon 5
Met benchmark	.53	.53	.60	.40	.47
Fell below benchmark	.47	.47	.40	.60	.53

N= 15

As a result of the 2016-17 data, the oral communication assessment was moved in 2017-18 to another course with an oral communications assignment in the HCA curriculum (HCA 511). This change provided additional performance results that again did not meet expectations for the competency and identified improvements necessary to enhance student learning outcomes. As indicated in the table below, the benchmark was not met for any of the five canons.

Table 2: Academic Year Outcomes for 2017-18

	Canon 1	Canon 2	Canon 3	Canon 4	Canon 5
Met benchmark	.67	58	.67	.58	.67
Fell below benchmark	.33	.42	.33	.42	.33

N=12

After the above-mentioned data was reviewed by stakeholders, the faculty concluded a "closing the loop" initiative was necessary to improve student performance to "meets expectation levels." An online instructional guide aligned with the rubric was developed for the students to assist them in understanding and improving their performance in this learning competency.

The combined data from academic years 2016-17 and 2017-18 was used as the baseline data to assess the impact of the closing the loop initiative on learning outcomes. Table 3 shows that the data from these two academic years were comparable and could be used as the baseline for the evaluation of the closing the loop initiative. There were no statistically significant differences in any of the canons between these two academic years.

Table 3: Comparison of Baseline Years, 2016-17 and 2017-18

	Mean & SD – HCA 598 (n = 15)	Mean & SD – HCA 511 (n = 12)	t-value	p-value
Canon 1: Content	2.88 (.39)	3.26 (.88)	1.26	.23
Canon 2: Organization	2.84 (.53)	3.10 (.96)	0.83	.42
Canon 3: Language	3.09 (.53)	3.01 (1.02)	0.25	.80
Canon 4: Delivery	2.73 (.54)	2.92 (1.13)	0.54	.60
Canon 5: Presence	2.85 (.52)	3.09 (1.11)	0.68	.51

The online instructional guide was available for the students before the next offering of the HCA 511 course (2018-19). For the next three years the professor randomly sampled twelve students per course per year and applied the rubric.

Students in the HCA 511 course were strongly encouraged to watch the video prior to their presentation. To determine if the instructional guide had a positive impact on their performance, the results over these three years is provided in table 4.

Table 4: Results of Curriculum Improvement on Learning Outcomes, 2018-20 – % that Met Benchmark

	Canon 1	Canon 2	Canon 3	Canon 4	Canon 5
AY: 2018-19	92%	67%	83%	83%	83%
AY: 2019-20	100%	75%	83%	83%	75%
AY: 2020-21	92%	83%	100%	92%	100%

n=12 students per year

The outcomes for these three academic years showed marked improvement after the implementation of the instructional video over the baseline results. In applying the benchmark, Canon 2 however fell beneath the benchmark for two of the three academic years. The faculty noted that Canon 2 did improve each year and achieved the "meets expectation level" in the 2020-2021 academic year. Table 5 compares the baseline data to the three years following the closing the loop initiative.

Table 5: Comparing Pre-Intervention to Post-Intervention

	Mean & Standard Deviation - pre	Mean & Standard Deviation - post	t-value	p-value
Canon 1: Content	3.05 (.73)	3.55 (.46)	3.12	.00
Canon 2: Organization	2.95 (.75)	3.24 (.64)	1.60	.12
Canon 3: Language	3.05 (.77)	3.55 (.48)	2.96	.01
Canon 4: Delivery	2.82 (.84)	3.32 (.49)	2.78	.01
Canon 5: Presence	2.96 (.82)	3.44 (.56)	2.65	.01

Note: N = 27 for pre-intervention group & N = 36 for the post-intervention group.

DISCUSSION

Indirect evidence collected from student and faculty interviews indicated that the nature of the course assignment, along with instruction provided ahead of time in preparation for it, seem to have played into the relatively flat scores manifested in the organizational canon performance prior to and after the utilization of the instructional video. Students received report format dictates ahead of time from the instructor to help them execute the presentation in accordance with routine disciplinary expectations. The instructional video did of course include explanation of this canon, but key to organization canon performance was the framing of the actual course assignment, for the instructor made clear to the students the desired structure of the presentation based on assignment objectives. As a result of this data the instructor clarified and emphasized desired organizational dictates, both in the assignment directions as well as in direct description to the students. These changes did result in consistently positive production in this area over the course of this study. As the scores indicated, the vast majority of performances displayed quite clear and more than competent understanding of such organizational dictates all along, providing decreased leeway for performance score improvement.

In any case, significant increases in four of five performance evaluation canons, as well as expectedly consistent but nonetheless positive scores in the canon that was the statistical outlier, represents marked success for the program. While this study manifested significant improvement in student presentation performance, there is yet room for further refinement of these competencies going forward. The following instructional design techniques may be considered:

First, mandated non-graded peer practice performances (i.e., "dry run throughs") that provide students with initial impressions of their presentation strengths and weaknesses before eventual execution for graded evaluation may be useful. While class time constraints may render this process difficult, after hours face-to-face (or virtual) practice sessions between paired students provide opportunity for such work.

Secondly, an instructional video resource was produced that targeted canonical application to the given presentation assignment as it was constructed by the instructor. The initial video recording resource provided but broadened insight and application to routine, professional presentation formatting and execution. The video helped students to: view the six disciplinary areas of analysis comprising the assignment as the de facto overriding organizational structure of the presentation; align presentation "main ideas" with the assignment's six disciplinary areas of analysis; and delineate presentation "sub ideas" as various questions for consideration pertaining to each area. Perhaps a more assignment specific video might target performance expectations particular to future course assignments and increase student performance along those lines.

Finally, in person dialogue with the instructor, or with the supporting oral communications expert, may provide students the opportunity to address questions arising from the instructional video itself. This could enhance student understanding of performance expectations, as well as allay latent performance anxiety issues arising there from, providing further opportunity for student improvement in learning outcomes.

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Appendix A – McGowan School of Business Master Grading Rubric for Oral Presentations

ELEMENTS *Sub Elements	EXCEPTIONAL	ABOVE AVERAGE	AVERAGE	DEFICIENT
	Above 3.33	3.00 to 3.33	2.00 to 2.99	Below 2.00
I. CONTENT: ***Purpose Statement** ***Main & Sub Ideas** ***Supporting Details** ***Knowledge of Company Circumstances** ***Handling of Q & A**	-Purpose was crystal clear, thorough, & eloquent. -Ideas were thorough, accurate, substantive, & clear. -Supporting Details were very substantive & very nicely varied. -Demonstrated extensive, studied understanding of company's circumstances. -Responses in 'Q&A' session were quite pointed, substantive, & succinct.	-Purpose was clear and thorough. -Ideas were clear, accurate, & thorough. -Supporting Details were substantive & somewhat varied. -Demonstrated good & thoughtful understanding of company's circumstances. -Responses in 'Q&A' were both clear & substantive.	-Purpose was sufficiently clear & literate. -Ideas were sufficiently clear & accurate. -Supporting Details were sufficient but needed much more substance & variety. -Demonstrated a basic & rudimentary understanding of company's circumstances. -Responses in 'Q&A' were adequately clear but needed more substance.	-Purpose was unclear &/or ill-worded. -Ideas were unclear &/or inaccurate. -Supporting Details were not adequate in quality &/or quantity. -Did not demonstrate a basic & rudimentary understanding of company's circumstances. -Responses in 'Q&A' session were neither substantive nor clear.
II. ORGANIZATION: ***Framing Message w/ Introduction & Summary** ***Format, Sequence, & Structure of Ideas** ***Transitional Language** ***Timing-Out Message** ***Discipline-Specific Formatting**	-Intro & Summary, (including 'Opener' & 'Closer') were very clear, effective, & compelling. -Main & Sub Ideas were very clearly & logically formatted & developed. -Transitional Phrasing was functional, effective, & strategic. -Presentation was very nicely balanced in time & idea development throughout message.	-Intro & Summary, (including 'Opener' & 'Closer') clearly & effectively framed the message. -Main & Sub Ideas were clearly & logically developed. -Transitional Phrasing was both functional & effective. -Presentation hit time constraints and was mostly well balanced in idea development.	-Intro & Summary, (including 'Opener' & 'Closer') functionally framed the message. -Main & Sub Ideas at least sufficiently covered topic. -Transitional Phrasing was fully present. -Presentation hit basic overall time constraints for length.	-Intro &/or Summary, (including 'Opener' &/or 'Closer') were missing or deficient. -Main & Sub Ideas did not sufficiently cover the topic. -Transitional Phrasing was missing or only partially present. -Presentation either ran significantly long or significantly short.

III. LANGUAGE: *Correctness, Clarity, Concreteness, & Conciseness of Wording *Industry-Appropriate Terminology *Color & Creativity in Word Choice	-Wording was correct & clear & eloquent in grammar & syntax. -Wording was most effectively concise, concrete, & compelling. -Demonstrated effective & strategic utilization of pertinent terminology throughout message. -Wording was consistently colorful, creative, & strategic.	-Wording was competently correct & clear in grammar & syntax. -Wording was concrete and concise enough for the subject matter. -Demonstrated effective command of pertinent terminology. -Wording manifested consistent color &/or creativity in message.	-Wording was mostly correct & clear in grammar & syntax. -Wording was generally concise enough but needed to be more concrete for the matter. -Demonstrated some command of pertinent terminology at times. -Wording manifested some color & creativity in message.	-Wording was too frequently incorrect &/or unclear in grammar & syntax. -Wording was too vague &/or too rambling &/or too abstract. -Demonstrated little or no understanding of pertinent terminology. -Wording lacked color & creativity.
IV. DELIVERY: *Vocal Delivery *Non-Vocal Delivery *Execution of Performance Aids	-Volume, Tone, & Rate were most effectively varied, animated, & expressive. -Articulation & Pronunciation were executed correctly & precisely. -Facial Expression & Eye Contact were very consistent & expressive. -Posture & Movement were very consistent &/or demonstrative. -Performance Aids were nicely & strategically designed & executed.	-Volume, Tone, & Rate were nicely varied, animated, & expressive. -Articulation & Pronunciation manifested few inaccuracies. -Facial Expression & Eye Contact were generally expressive. -Posture & Movement were comfortable & easy. -Performance Aids were well designed & executed.	-Volume, Tone, & Rate were somewhat varied, & expressive. -Articulation &/or Pronunciation manifested some inaccuracies. -Facial Expression & Eye Contact were somewhat expressive. -Posture & Movement were not problematic. -Performance Aids were adequately designed & executed.	-Volume, Tone, & Rate were unvaried & inexpressive. -Articulation &/or Pronunciation were too frequently incorrect &/or unclear. -Facial Expression & Eye Contact were too inconsistent and uncommunicative. -Posture &/or Movement were uneasy &/or distracting, &/or anxious. -Performance Aids were poorly designed &/or executed.
V. PRESENCE: *Manifested confidence & command in Delivery. *Manifested enthusiasm & energy in Presence. *Gave a full & genuine Effort *Execution in Performance Mode	-Anxiety was not at all evident in presentation. -Presentation was poised, confident, & commanding. -Message manifested high energy & abundant enthusiasm for subject. -Effort was above and beyond expectation for the task. -Smooth & seamless execution.	-Anxiety was mostly well-managed. -Presentation was poised & confident. -Message was delivered with good energy & obvious enthusiasm. -A full & genuine effort was clearly manifested. -Solid & competent execution of planned mode of delivery.	-Anxiety was at times evident in presentation. -Presentation was adequately poised but need more confidence. -Message was delivered with sufficient energy but lacked enthusiasm. -Preparedness & effort was sufficient for the task. -Adequate execution, but uneasy at times in mode of delivery.	-Anxiety affected presentation in a significant way. -Presentation lacked poise & confidence. -Message manifested little energy or enthusiasm. -Preparedness & effort were clearly at question. -Very problematic execution of planned mode of delivery.

The "Big Six" as a Strategic Imperative: Student Success and Life Preparedness

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ABSTRACT

This article explores the background and impact of Gallup's "Big Six" research and publications on educational outcomes. The pertinence of the Big Six in achieving positive post-graduation success and work life preparedness remains focal. A case study from the Barnett School of Business and Free Enterprise at Florida Southern College is presented that examines the measurement, application, and efficacy of the Big Six in developing student success and life preparedness. In doing so, the work reviews the contribution of high impact practices to the success of the business program and how this success can work to aid other programs/institutions seeking to improve student outcomes.

Keywords: Big Six, work life preparedness, assessment, student outcomes

INTRODUCTION

Life preparedness is a major theme in higher education today. Colleges and Universities are increasingly under pressure to produce a positive return on investment for students and their families. Gallup, in partnership with Purdue/Strada, undertook a major study starting in 2014 to identify variables in the college experience that produce a meaningful lift in life preparedness. The "Big Six" survey, as it is termed, identified six meaningful variables related to levels of support and experience. Each incremental experience resulted in stronger life preparedness outcomes for young graduates; specifically, higher graduation rates and successful workplace transitions (Seymour & Lopez, 2015). Not surprisingly, the Big Six has thereby been recognized in both scholarly and popular press as an increasingly important predictor of student success.

The current work details the efforts of a small private business program seeking to achieve success in the midst of myriad challenges by focusing on the factors included in the Big Six study. It is suggested that the results from the case study detailed herein holds lessons applicable to other college programs as they seek to measure, improve, and ensure student life preparedness.

BACKGROUND

Now more than ever colleges and universities are seeking out 'difference makers' to better prepare students for life after college and to distinguish their programs in the face of an increasingly competitive higher education environment. Furthermore, students and parents are increasingly focused on the return on investment from the major expense of higher education. To address the issue, Gallup, Purdue University, and the Strada Education network commissioned a major study of post-graduation student success. Originally termed "Gallup-Purdue Index" and now referred to as the "Strada-Gallup Alumni Survey", the effort details results from surveying over 100,000 American college graduates about their college experiences and how these experiences help improve their chances for work and life success after graduation (Bruni, 2018).

The results, first published in 2015, illustrated how six major college experiences are linked to life preparedness, stronger graduation rates, and confidence on the job. The six items ultimately included three issues related to academic support ("I had at least one professor who made me excited about learning", "My professors cared about me as a person", and "I had a mentor who encouraged me to pursue my goals and dreams") and three issues related to experiential learning ("I worked on a project that took a semester or more to complete", "I had an internship or job that allowed me to apply what I was learning in the classroom", and "I was extremely active in extracurricular activities and organizations while I attended college"). The results of the studies revealed that each incremental Big Six item was associated with more preparedness, and that each of the experiences were related to both time to complete the degree and confidence on the job post-graduation.

Specifically, the percentage of college graduates who strongly agreed their colleges prepared them well for life after graduation increased with each additional experience. To illustrate, eighty-two percent of graduates who strongly agreed that they had all six experiences as an undergrad, also strongly agreed their schools had prepared them well for life after college. In contrast, merely 5% of those who did not strongly agree that they had any of these six experiences strongly agreed that they were well prepared for life after college. Similarly, four-year graduation rates also improved to 75% for those students with all six experiences versus 61% of those who did not strongly agree with any of the six experiences (Seymour & Lopez, 2015).

Furthermore, an assessment of more than 32,000 students in 2019 by Strada and Gallup revealed the Big Six experiences were linked to student confidence on the job market. The proportion of currently enrolled students who strongly agreed that they were confident they would graduate with the skills and knowledge they would need to be successful in the job market rose steadily with the number of the experiences they had. Among those that strongly agreed that they had merely 3 or fewer of the experiences, 28% strongly agreed that they were confident they would graduate with the skills and knowledge they would need to be successful in the job market. More notably, that figure rose from 12% among students who have none of the six key collegiate experiences to 76% among students who had all six (Crabtree, 2019).

The purported success of the Big Six has led to well-respected news publications including feature coverage of the instrument, including the *Wall Street Journal (WSJ)*, *The New York Times (NYT)*, and *The Chronicle of Higher Education*. As a case in point, the *WSJ* published a notable piece in 2019 entitled "The Right Way to Choose a College" by Denise Pope which focused on the importance of student engagement inside and outside the classroom (Pope, 2019). The article highlighted the Big Six studies and the link between the experiences and resultant life preparedness, future job satisfaction, and well-being. Importantly, Pope notes that what students "*do*" at college appears to matter much more than where they "*go*". Similarly, Pulitzer award winning journalist and Duke University professor Frank Bruni published a column in the *NYT* on August 17, 2018 entitled "How to Get the Most Out of College". In the piece, Bruni focused on the optimal ways to socialize and prioritize skills integral to career development and to open up exciting opportunities through the college experience (Bruni, 2019). Bruni cited the Gallup Big Six study and commented on "game changers" for students which included things like establishing a deep, ongoing connections with a mentor, engaging in ongoing academic project(s) and participating significantly in campus organization(s). He described the Big Six, in his words, as reflecting "engagement and commitment, which I've come to think of as overlapping muscles that college can and must be used to build [SR, Pg. 1]".

The Chronicle of Higher Education has also featured articles referencing the importance and credence of the Big Six. For example, Aaron Basko penned the article, "Have We Gotten Student Success Completely Backward: Instead of fretting over why their students might leave, colleges need to make sure each one has a good reason to stay" (Basko, 2021), discussing the major success Georgia State University built in six year graduation rates by actively "nudging" students in the direction of the Big Six. Basko goes on to mention other colleges becoming active believers and supporters of the Big Six, emphasizing the positives of the support and experience dimensions.

CASE STUDY

Given that the high impact practices and experiences identified by Gallup are readily transferable and measurable to college and university programs and that smaller collegiate settings are typically better equipped to ensure high-touch variables such as mentoring and caring professor relationships, the Barney Barnett School for Business and Free Enterprise (hereafter "BBS", or Barney Business School) took a keen interest in the Gallup findings. BBS has a mission that prioritizes meaningful, deep engagement among students, faculty, and the broader business community. The School continually seeks to understand, assess, monitor, and improve on high impact initiatives that ensure its graduates are equipped to make a positive and consequential impact on society post-graduation. The Gallup Big Six study provided an ideal tool for assessing our delivery on the six experiences that make a life changing difference for students. As such, the BBS developed a plan for a Big Six tracking study and began data collection in academic year 2017. Since that time, the school has consistently assessed Big Six measures among graduating seniors via a survey methodology in our senior seminar course.

DATA COLLECTION

The BBS Bix Six survey instrument assesses the six items presented previously ("I had at least one professor at FSC Barnett Business School who made me excited about learning", "My professors at Florida Southern College BBS

cared about me as a person", "I had a mentor who encouraged me to pursue my goals and dreams", "I worked on a project that took a semester or more to complete", "I had an internship or job that allowed me to apply what I was learning in the classroom", and "I was extremely active in extracurricular activities, organizations, or athletics while I attended Florida Southern College") by utilizing a five-point Likert scale. The first three questions address student support and the next three assess student experiences. The ranking is: strongly disagree, disagree, neither agree or disagree, agree & strongly agree. Note that this method aligns with the Gallup methodology.

The survey was administered each academic year (2017-2021) on a blind basis to graduating seniors via SurveyMonkey. Participating students were enrolled in the BBS capstone senior seminar business course, which is typically taken during the final semester immediately preceding graduation (in both Fall and Spring semesters). Due in part to email and instructor reminders, response rates averaged approximately 95% each year. It is important to note that the survey was administered by the same Management professor over the five-year horizon to-date and that graduate assistants were utilized for data tabulation. The results have been reported to college faculty annually, and they work to inform our strategic planning process and to aid in AACSB reaffirmation efforts. Importantly, the systematic effort not only enables us to highlight our strengths, but it also provides the college with important input into continual improvement initiatives.

RESULTS

As noted, the BBS has now completed five academic years of tracking from academic year 2017 through 2021 (see Table 1). Across each individual and cumulative measures of support and experiential elements, BBS has enjoyed positive findings. The overall results have been quite consistent over the years assessed, most notably regarding support measures. Additionally, experiential measures have seen improvement in the most recent three year time span. Note that the results in Table 1 include those responses selected as "strongly agree", which is consistent with the Gallup studies.

Table 1: Bix Six Survey Results

	% Students - Strongly Agree (only)				
Support:	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
I had at least one professor at FSC Barnett Business School who made me excited about learning.	67	70	74	72	69
My professors at FSC BBS cared about me as a person.	51	48	50	50	51
I had a mentor who encouraged me to pursue my goals and dreams.	39	41	40	45	44
Strongly agree with all three support statements:	30	26	33	27	29
Experiential Learning:	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
I worked on a project that took a semester or….	29	42	46	35	37
I had an internship…that allowed me to apply..	72	77	72	70	86
I was extremely active in extracurriculars…..	48	42	46	48	48
Strongly agree with all three experiential statements:	13	14	21	18	21
Strongly agree with all six:	7	7	11	13	12

While the results of our tracking have been received as positive by our faculty, they have also work to inform areas for improvement. For example, it is noted that the driver for the significant increase in the experiential statements reflects the implementation of internship and professional development courses as core curriculum requirements at BBS. Prior to four years ago, internships were merely a business elective option. The most recent class of students all entered the curriculum on an academic catalog with the internship requirement.

Comparative Data

While data tracking is certainly important, we further seek to examine comparative benchmarks across the Big Six (see Table 2). Accordingly, BBS utilizes results published by Gallup (Crabtree, 2019) to provide data for use in comparing performance across the Big Six measures. When measured against other small colleges (operationalized as schools with total enrollments under 5,000), FSC has performed favorably. FSC has an enrollment of approximately 2600 students, and BBS has a FTE of approximately 900. It is noted that Gallup publishes results for U.S. business school programs for the support measures only, therefore experiential measures for U.S. business schools are not available.

Specifically, BBS outperforms colleges with enrollments of less than 5000 and also against all included business programs in the study. BBS shows especially strong performance in experiential measures versus small colleges. This is very much in line with the BBS focus on experiential learning. Also, the strength of the BBS Support measures versus business programs is exhibited in the "strongly agree with all three items" item where we have more than double the "strongly agree" score of the average business program. This is indicative of exceptional support versus the typical business program. We believe that our focus on professor engagement with students both in and out of the classroom is reflected in these scores. Each BBS professor serves as an advisor/mentor to serve students from year two through graduation, which affords a great opportunity for frequent engagement.

Table 2: Barnett outperforms Colleges <5000 & Other US Business Programs

% Strongly Agree

	Barnett Business	Colleges <5000	US Business Programs
Support Measures:			
Professor(s) made me excited about Learning	70	66	53
Professors cared about me as a person	52	45	26
I had a mentor who encouraged me…	42	34	22
Strongly agree with all three items	29	25	13
Experiential Measures:			
I worked on a semester long project	38	26	na
I had an internship…apply what I learned	76	44	na
I was extremely active in extracurriculars..	47	21	na

More importantly, the strong performance of BBS has been corroborated in recent years through outside assessment. Notably, *Poets & Quants* 2021 "Best Undergraduate Business Schools" survey of recent alumni reported BBS as *the* top school in the country for "Quality of Teaching". In 2022, BBS returned with outstanding ranking for "Quality of Teaching, at #6, and, "Faculty Availability for Mentoring" at #6. These rankings are indicative of the support and teaching quality students receive at BBS and they work to corroborate previous work on the importance of the Bix Six indicators. As a summary statement, the faculty believe that the Big Six instrument has strengthened our foundation with key, results-oriented assessment data. Ultimately, the data provides another basis for ensuring that the School delivers on its brand promise.

DISCUSSION

At BBS, the focus on the Big Six works to ensure both student life preparedness and confidence entering the job market. The approach in the School has been to consistently administer the survey, to bring forward the results to faculty in an annual strategy session for an open forum, and to share areas of focus for continual improvement. For example, the faculty has recently focused on dialogue and awareness building among students about the semester-long project experiences they have participated in and how a project management approach will help them in career development. We have also begun to celebrate project success in a more visible way with awards for excellence &

features in our Barnett School monthly newsletter focused on student projects & success stories (outstanding interns, student entrepreneurs, mentor/mentee relationship and others). Additionally, we have significant expanded business student project presentations at college-wide "Fiat Lux" student research sessions. Finally, to support our internship/placement initiative, we added two full-time support staff in BBS to guide/mentor students in internship and professional placement.

Building on mentorship success is an important strategic focus going forward. BBS has made a student engagement/mentoring focus integral in the faculty recruitment process. We seek faculty exhibiting a student centric orientation in all three facets of their work: teaching, research & service. In addition to effectively onboarding new faculty, we plan to share best practices among current faculty in a mentoring strategy session, recognize superior faculty mentorship in a public forum, and better promote mentorship in our communication channels between students and faculty. In addition, we have an opportunity for deep dialogue with stakeholders (focus groups with students and employers, depth interviews, etc.) as an effort to build upon the foundation of our Bix Six quantitative research. BBS is proud to be endowed with a strong culture of student support and mentorship. At the same time, we recognize rising expectations among students and families for greater support in the private college arena and we strive to continually improve in this area.

For our peers, we believe that our self-monitoring of the Big Six support and experiential elements presents a transferable approach that other schools may consider adopting. As suggested in the data presented herein, schools of business currently index lower than colleges as a whole. We strongly believe that it is important for business academe to recognize the need to deliver on the Big Six, to establish baseline measures and strategic goals in order to maintain competitiveness, and to thereby ensure strong student outcomes. Delivering outstanding curriculum involves the whole person, especially for institutions built on the value proposition of face to face instruction in a small college setting. A Big Six focus for business program has extraordinary payoff. The investment in most cases is small and the rewards large. Alternatively, a lack of focus on these key elements in a program is a cause for concern regarding program vitality and, potentially, viability.

CONCLUSION

It is clear that students, parents, and indeed society as a whole, are expecting more from institutions of higher education and business schools are not exempt from increased scrutiny. Indeed, the very success and longevity of business education will continue to be impacted significantly by the evolving climate. As we have begun to navigate the post-pandemic environment, now more than ever, the Big Six will be critical to student success, particularly as colleges attempt to "play catch-up" following the negatively impacted learning of the Covid era. The experiences of the BBS reveal that not only are the Bix Six indicators vital to long-term success, but that they should be viewed as a strategic initiative in the increasingly competitive educational landscape of today. It is hoped that the results from this case study encourages other business programs to consider the role that the Big Six can play in their success.

ACKNOWLEDGEMENTS

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The YOU DRIVE: A Deliberate Approach to Effective Active Learning

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ABSTRACT

In higher education, active learning approaches have been described as effective and preferred by most students. Notably, these approaches require increased work on the part of the instructor and are not necessarily beneficial without deliberate forethought and preparation. To address the need for effective active learning, I have evolved and implemented the YOU DRIVE approach across four different courses, 16 separate sections and three academic years. The YOU DRIVE approach establishes foundational knowledge, puts students in an active role in solving problems, allows the opportunity to make mistakes, and prompts students to reflect and learn from the experience. Students have found the YOU DRIVE approach to be fundamental in their success towards learning various business management concepts. Instructors can adopt the YOU DRIVE method to conduct structured and effective active learning.

Keywords: active learning approaches, experiential learning, problem-based learning, higher education

INTRODUCTION

Teaching undergraduates within the supply chain and operations management fields, I have found that students learn best when they are required to perform problems themselves. Rather than just having students perform more problems in class, a more deliberate and strategic approach may be required for active learning efforts to be effective. Students require a foundation of knowledge to apply concepts within a given situation; establishing this foundation may require some instruction that is somewhat passive, such as a lecture or overview. Furthermore, active learning begins with careful and deliberate preparation from the instructor. The instructor must plan the timing of the active learning event, as well the foundational knowledge required. In terms of the active learning event, the instructor must establish the proper environment which requires students to take an active role, make mistakes without penalty, and reflect on the experience. In other words, for active learning efforts to be effective for students, many conditions must be met. To establish a deliberate approach to active learning, the YOU DRIVE approach was developed.

The YOU DRIVE approach combines some passive learning techniques with programmed active learning exercises. For example, students may participate in an overview on one class day, then participate in a planned YOU DRIVE exercise during the next class session. This is not to say that the overview is strictly passive, as much as it is to emphasize the active learning intent of the YOU DRIVE exercise. The programmed YOU DRIVE exercise evaluates and validates this foundation of knowledge by putting students into active and problem-based situations in which they must apply the knowledge they have just gained. The structure of the YOU DRIVE approach helps students assess their own learning, build confidence, and identify areas for further review and study. While the YOU DRIVE has been used with undergraduate students seeking business degrees in quantitative related fields, instructors can generalize and implement the approach for other populations.

ACTIVE AND PROBLEM-BASED LEARNING

The YOU DRIVE approach originates from the traditional process of teaching someone how to drive a car. With the traditional approach, the student sits in the passenger seat and watches the instructor drive. After watching the instructor drive, the student and instructor switch seats. While in the passenger seat, the instructor observes the student driving, provides feedback, validates the student's abilities, and takes corrective action if necessary. To teach new skills or introduce more complicated situations, the student and instructor will once again switch seats and repeat the process.

The act of moving the student to the driver's seat is an active approach. Active learning approaches require students to act and do things (Kolb, 1984; Burch, Heller, Burch, Freed and Steed, 2015; Berube, 2020; Albright and Finn, 2020; Humphreys, Bakir and Babb, 2022). Within active learning approaches, problem-based learning (PBL) puts students in situations in which they must identify the problem at hand, select the necessary knowledge to solve the problem, and work to find a solution. Common active and problem-based learning exercises are competitions, in-class group work and simulations, as well as activities that occur outside of the classroom (Biggs, 1999; Huxham, 2005;

Cavanaugh, 2011; Jin, Wu, Cunningham, and Chinta, 2015; Fathelrahman and Kabbar, 2018; Lin, 2018; Burch, Giambatista, Batchelor, Burch, Hoover, & Heller, 2019; Goi, 2019; Nonis and Hudson, 2019; McCauley, 2019; Chuang, 2019; Peters and Stamp, 2021; Spivack, 2021; Obi, Eze and Chibuzo, 2022).

Active approaches in higher education have shown to increase student interest and involvement (Prince, 2004; Snider and Eliasson, 2013; Freeman, Eddy, McDonough, Smith, Okoroafor, Jordt and Wenderoth, 2014; Haug, Wright and Huckabee, 2019) and also increase students' ability to solve problems (Whetten, 2007; Artbaugh, 2015; Carriger, 2015; Kitchens, Means and Tan, 2018). Problem-based learning has been effective within math and science-based fields, with evidence supporting better performance from PBL students than non-PBL students (Kovacs, Kuruczleki, Kazar, Liptak and Racz, 2021). Additionally, students in higher education have indicated a preference toward experiential exercises and settings (Haug, Wright and Huckabee, 2019).

While preferred by students, active learning approaches require additional design, planning and preparation by the instructor to be effective. Instructors must give careful attention to planning and implementing these approaches, linking them to established learning objectives, and scaffolding them with foundational instruction (Kitchens et. al, 2018). Supported by these theoretical underpinnings, the YOU DRIVE approach was implemented and evolved.

LEARNING OBJECTIVES FOR THE YOU DRIVE APPROACH AND INDIVIDUAL EXERCISES

The overall goal for the YOU DRIVE approach is to build a structured environment in which students are afforded active learning opportunities to apply knowledge and solve problems. By structured, this means that YOU DRIVE exercises are described within the course syllabus, planned at deliberate intervals throughout a course, and depicted within the course schedule.

After completing a YOU DRIVE exercise, students will be able to:

- Demonstrate understanding of course concepts.
- Apply course concepts.
- Identify and fill knowledge and skill gaps.
- Seek and implement instructor feedback.

INSTRUCTIONS FOR ADOPTING A YOU DRIVE APPROACH AND EXECUTING A YOU DRIVE EXERCISE

When planning a course, first determine the balance between instructional sessions and YOU DRIVE exercises. In more mathematically based courses, it may be helpful to conduct YOU DRIVE exercises every other class session; in other courses, it may be effective to conduct YOU DRIVE exercises at a larger interval. Regardless, scheduling YOU DRIVE exercises ahead of time provides structure for students and makes active learning part of the course culture, as opposed to a surprise or unannounced event.

Step 1: Prepare the YOU DRIVE Exercise

When preparing a YOU DRIVE exercise, identify both areas within the knowledge that you want students to understand, as well as those areas in which students most commonly have difficulty understanding. As the YOU DRIVE is an active learning exercise, you want to create conditions in which students must apply the concepts they have just learned.

The problem sets and other situations students encounter during YOU DRIVE exercises should be aligned with learning objectives and problem students will see in future homework, additional assignments, and especially exams. Doing so creates the low-stakes environment for students to practice applying concepts, techniques, and methods without the pressure of formal assessment. Once students see this alignment, they will approach YOU DRIVE exercises as valuable practice sessions.

The source of the problem sets is the instructor's preference. Problem sets can be created by the instructor, selected from a textbook, or developed from a combination of the two.

In terms of general structure, YOU DRIVE exercises should consist of two components: a scenario that provides context for the problem set and prompts that require students to apply their knowledge. Prompts should require students to perform some sort of action. For example, these can include performing computations, constructing diagrams, charts or tables, developing arguments or points of logic, writing short essays, or making selections from a list of solutions. The prompts should require students to think and make decisions about the knowledge they are applying.

Additionally, fully prepare all materials required for the specific YOU DRIVE exercise. At a minimum, this will include worksheets and handouts for students to complete, but may also include diagrams, visuals aids, and other supplementary material.

Figure 1 provides an example of a YOU DRIVE Exercise on productivity. It contains the relevant learning objectives, along with three problems sets and supporting prompts. For this example, students would work through all three problem sets within a 75-minute class period. An additional YOU DRIVE example is provided within the appendix to this article.

The next series of steps describes the execution of the YOU DRIVE exercise. YOU DRIVE exercises are best conducted within a dedicated, full class period.; they are described below for a 75-minute session.

Step 2: Provide Rules of Engagement (5 minutes)
Begin the YOU DRIVE exercise by quickly orienting students to the learning objectives, but also the YOU DRIVE Rules of Engagement. The Rules of Engagement will provide students structure for the behaviors that will contribute to their active learning experience. Emphasize that students need to actively perform problems, seek clarification and assistance when they encounter difficulty, and seek validation when they feel they have finished the work. The following are sample YOU DRIVE Rules of Engagement:

- Please focus on the work at hand!
- Use your notes as necessary.
- Work with others if you desire.
- Actively seek clarification if you do not understand the questions involved with the scenario.
- Actively seek assistance if you are unsure how to proceed.
- Actively seek feedback from the instructor on your work.
- Identify and learn from your mistakes.

Step 3: Provide Immediate Feedback (55 minutes)
Encourage students to seek clarification when they do not understand the scenario, or to seek validation when they have arrived at a solution. Some students will be hesitant to do either due to their fear of being wrong. Remove this fear by looking at their work as they are progressing, before they solicit feedback. Comments such as "*That looks really good*", "*That looks like it is on the right track*", and "*You may want to look at this again*" are all helpful, particularly towards easing tension and potential awkwardness between you and the student.

Prompt students to use and improve their notes. Highlight areas of students' notes that are incomplete or could be improved further. Use whiteboards and other means to review concepts as students are employing them. For problem sets that require the students to build charts or tables, be prepared to quickly show the student how to do so on their personal computer.

Engage students in a full and balanced fashion. Some students will want and seek lots of feedback, others a little, and a few none at all, so moving from one student to the next may initially be a challenge. With more complicated mathematical problems sets, such as ones dealing with statistics and probability, carry a personal "cheat sheet" to reference answers and diagnose student problems quickly. Engagement and interaction are key during the YOU DRIVE exercise, so be prepared to be moving constantly throughout the period in which students are actively working.

Figure 1, YOU DRIVE Example (Productivity)

Learning Objectives:
- Understand the definition of productivity.
- Understand the purpose of measuring productivity.
- Be able to determine the productivity of a given method or process.
- Be able to compare the productivity of one method to another based on a single input.
- Be able to compare the productivity of one method to another based on multiple inputs.

Problem Set #1

Scenario: Nancy wants to compare the productivity of her cake-baking operation to that of her competitor, Martha. Last month, Martha made 500 cakes. She spent $725 on labor, $500 on her ingredients, and $300 on her ovens.   During the same timeframe, Nancy made 400 cakes. Nancy spent $525 on labor, $600 on ingredients, and $95 on her ovens.

Prompts:

- In terms of labor, how much more or less productive was Nancy relative to Martha?
- In terms of all inputs, how much more or less productive was Nancy relative to Martha?
- In terms of oven costs, how much more or less productive was Martha relative to Nancy?

Problem Set #2

Scenario: Nancy's friend, Alexander, currently makes cakes. In a 10-hour workday, Alexander produces 24 cakes. Within that workday, Alexander has three workers working the entire day. Alexander pays each worker $12 per hour.

Alexander tries a new method of making cakes. Under the new method, Alexander produces 30 cakes in a 9-hour workday. Alexander still has three workers; he pays each worker $14 per hour.

Prompts:

- How much more or less productive is Alexander's new method compared to his current method?
- Nancy's other friend, Mark, states that Alexander's new method is clearly more productive than the old method because Alexander produced more cakes (30 with the new, 24 with the old). Analyze this statement. Would you agree or disagree? Why?

Problem Set #3

Scenario: Nancy gathers some additional data concerning her last month performance, as well as two of her competitors, Wanda, and Kylie.

Before moving from one student to another, close with the student by asking, *"Does this make sense?", "Do you understand more now?" "Do you have any other questions?"* Closing the loop helps build the student's confidence and furthers the connection between the instructor and the student.

Step 4: Observe and Take Notes
Use the format for the YOU DRIVE debrief to make observations during the period that students are actively working. Capture mistakes and errors students make, concepts that noticeably become clearer, and areas of remaining difficulty.

Step 5: Debrief and Lessons Learned (15 minutes)
Prior to the end of the class period, lead a debrief discussion with the students, surrounding the following:

What mistakes did you make? Arguably, this is the most vital part of the debrief, as it will identify common areas in which students make errors and assist in preventing future similar errors. Realizing the nature of errors also contributes to students' depth of understanding.

Similar to the discussion on engagement, students will initially be hesitant to share mistakes they made with their peers. Prepare for this by identifying students during the 'execution' section who made mistakes and learned from them; prepare these students by saying, "*I would like you to share this point during the debrief.*"

What concepts became clearer to you? For this portion of the discussion, have the learning objectives handy and visible. This will help the students make an effective connection between the YOU DRIVE exercise and the foundational instruction they have previously received. This will also contribute to students gaining confidence in their new knowledge gained.

With which concepts are you still having difficulty? This portion of the discussion is valuable in identifying concepts and material that merits additional reinforcement. Prior to the class session ending, work through the section of the YOU DRIVE that challenged students the most.

Getting students to reflect and share observations concerning their learning, particularly in the area of making mistakes, may be difficult. One technique is to use the Think-Pair Share (TPS) technique (Kaddoura, 2013). Providing the leading questions described above, putting students into pairs or smaller teams, and providing a short amount of time for students to discuss their YOU DRIVE experience prior to sharing with the entire class, may be helpful towards getting students to actively reflect.

Step 6: Follow-up
Close to the end of the class session, post the YOU DRIVE solution to the Learning Management System. Encourage students who had trouble during the YOU DRIVE session to perform the YOU DRIVE again, either on their own or with you during office hours. Moreover, encourage all students to continue to reflect on the lessons they learned during the YOU DRIVE.

VARIATIONS

I have employed several variations in executing YOU DRIVE exercises. These can be employed based on the difficulty of the material within the exercise or the conditions under which an exercise is conducted. Additionally, employing a variation can simply add variety to the YOU DRIVE approach.

Work Performed in Assigned Groups
This method works best with concepts, scenarios or problems that are more complicated. Prior to this session, balance groups based on individual student abilities. With this method, it may be that individual students check in with the instructor less and each other more. Stronger students will teach and lead the others, but it will still be necessary for the instructor to stay connected with each group. As part of this method, it may be helpful for the YOU DRIVE to be sectioned out, with the instructor releasing sections at timed intervals. For example, the YOU DRIVE could be broken into four rounds, with one round being posted to the Learning Management System every 15 minutes for groups to complete. Particularly if different groups have different scenarios, this method can be enhanced by having each group describe their problem-solving process on a whiteboard for the rest of the class to see; this provides students an even wider view of application beyond the specific problem they may have been assigned. It also offers students additional practice problems to perform as a follow-on to the YOU DRIVE exercise.

Work Performed as An Entire Class

This method works best with synchronous but remote settings, or as a change from previous YOU DRIVEs that have been conducted in the standard method. With this method, the instructor introduces the problem to the entire class, then calls upon different students to work portions of the problem. To offset student fears about appearing wrong in front of their peers, the instructor can publish the YOU DRIVE problem set several days prior to the session and encourage students to work through it independently prior to the session in more of a 'flipped classroom' method.

Work Performed as Individuals, Then Worked Through as a Class

This method works best when conducting a diagnostic assessment or review prior to an exam. With this method, the instructor has students work as individuals without help from each other. Once the students are complete with the work, the instructor calls upon students to talk through sections of the problem for the class. Also with this method, the instructor can constrain the students with time, by giving a portion of the problem set and a time to complete the problem, then calling upon students at the end of the time allotted. Instructors can further constrain students by not allowing them to reference their notes, as a means of assessing depth of knowledge and preparation for the upcoming exam.

STUDENT FEEDBACK

As a means of assessing students' perspectives regarding the YOU DRIVE approach, I examined end of course student evaluations. Specifically, I recorded the number of positive mentions the YOU DRIVE approach received in response to the course evaluation open-ended question, "What was most valuable about this course?" In reviewing sixteen sections from four courses across three academic years, I found that the average mention percentage among students was 36%, with a median of 38%. Forty-two percent of the sections mentioned the YOU DRIVE at a percentage of 39% or higher. Course evaluations were not conducted in Spring 2020 due to the COVID-19 outbreak. These results are depicted in Table 1.

Table 1: Percentage of YOU DRIVE Mentions on Student End of Course Evaluations

Course	Semester	# Mentions	# Total Responses	Percentage
Operations Management	Fall 2019	3	16	19%
Operations Management	Fall 2019	7	19	37%
Data Driven Decision-Making	Fall 2019	4	19	21%
Total Quality Management	Fall 2020	5	20	25%
Operations Management	Fall 2020	7	14	50%
Operations Management	Fall 2020	6	14	43%
Logistics Management	Fall 2020	5	16	31%
Data Driven Decision-Making	Spring 2021	7	18	39%
Data Driven Decision-Making	Spring 2021	7	17	41%
Operations Management	Spring 2021	3	11	27%
Operations Management	Spring 2021	9	19	47%
Logistics Management	Fall 2021	10	22	45%
Operations Management	Fall 2021	10	21	48%
Total Quality Management	Spring 2022	11	22	50%
Data Driven Decision-Making	Spring 2022	3	17	18%
Operations Management	Spring 2022	5	19	26%

Student comments about YOU DRIVEs grouped around five central themes: increased knowledge through regular application, increased understanding through real-world problem solving, increased understanding through asking questions, learning by doing and collaboration.

Increased Knowledge through Regular Application

Student comments within this area referred to the pattern of following lecture and overview with active learning exercises to reinforce understanding:

- "The YOU DRIVEs really solidified and expanded my understanding of the material we went over in lecture the day before."
- "The YOU DRIVEs give you a chance to test your knowledge and apply what we have learned the days prior on your own."
- "I liked how the weeks were set up where we would learn new material on Tuesday, and then practice with YOU DRIVEs on Thursday. It helped strengthen our knowledge of the material we learned."
- "The YOU DRIVE method of learning something new on one day and then applying what you learned on another is great. This method helped me substantially. Typically, professors lecture the materials and then expect you to solely apply what you have learned through homework when they are not there to help you."

Increased Understanding through Real-world Problem Solving

Student comments in this area referred to the problem-solving learning aspect of the YOU DRIVE. This falls mainly in the power of context, particularly for students who may have difficulty understanding situations in which the knowledge can be applied:

- "The YOU DRIVEs helped me connect statistics to the real world."
- "The YOU DRIVEs were very valuable as they allowed us to use what we learned to solve a real-world problem. Additionally, the YOU DRIVEs allowed everyone to get involved so people could learn from their mistakes."
- "The YOU DRIVEs made me really consider the information I learned in class and put it to use in real scenarios."
- "The YOU DRIVEs were the most valuable by making us apply what we learn to real problems."

Asking Questions, Gaining Clarification, and Increasing Understanding

Student comments in this area referred to the opportunity for students to ask questions and gain clarification on concepts as they are applying them:

- "The YOU DRIVEs gave us a time to ask questions while doing the problems."
- "If there was something I didn't understand, after completing a YOU DRIVE and discussing it as a class, I always felt like I knew exactly what I was doing."
- "YOU DRIVEs helped me understand the material we learned in the previous class, what questions to ask, or what parts I needed to practice more."
- "YOU DRIVEs are where a lot of learning occurs, as we can work on problems while the instructor is answering questions in real-time."
- "The YOU DRIVEs allowed me the chance to learn what I knew and didn't know, which helped me prepare for exams."
- "I think showing us how to do the problems first and then having us do the YOU DRIVEs helped identify where we lacked understanding and needed clarification. It also shows what we don't know which I think is very helpful."
- "Performing YOU DRIVEs in the presence of the instructor is great for learning."

Learning by Doing

Student comments in this area referred to the learning by doing element of the YOU DRIVEs. This enabled the students to learn the concepts at hand and reinforced the students' ability to successfully apply the material in future situations.

- "I really liked the use of the YOU DRIVEs to make sure we practice the material without the pressure of a quiz."
- "The YOU DRIVEs were a big help to me in this course because we would be challenged to work on problems in class and ask questions in the moment."
- "I enjoyed YOU DRIVEs. I think it's a good idea to teach us the content and then for us to put our gained knowledge into YOU DRIVEs. Doing so makes us learn the material. A lot of professors just throw the material out there and it's hard to grasp without doing."

Collaboration

Student comments in this area addressed the ability to learn from fellow students.

- "The YOU DRIVEs encouraged collaboration among classmates which increased my learning as an individual."
- "YOU DRIVEs required critical thinking and encouraged students to work together to accomplish a task.
- "I enjoyed the interactive elements of YOU DRIVEs."

CONCLUSION

Active learning approaches require deliberate forethought, planning, organization and detailed execution in order to be effective. The YOU DRIVE approach is intended to provide a deliberate approach to effective active learning. It is designed to put students in an active learning role, in a safe environment, supported by a foundation of knowledge. I have used it to teach undergraduate business analytics, operations management, logistics management and total quality management, but it is generalizable to many more courses and material. Throughout executing the YOU DRIVE approach over four years, I have found that students increasingly value the YOU DRIVE method, as it provides quick feedback, the opportunity to practice and fail without penalty, and immediate access to the instructor. Students have also expressed that their confidence increases through YOU DRIVE exercises. Moreover, students who have returned to YOU DRIVEs during follow-on study and reflection periods have increased the ability to recall and apply concepts in future situations. Students will also appreciate the structure of regular, programmed YOU DRIVEs. The YOU DRIVE approach has the potential to build a shared active learning community within a course.

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APPENDIX: YOU DRIVE EXERCISE: ADDITIONAL EXAMPLE

The following is an additional example of a YOU DRIVE exercise. This example is designed for a 75-minute class, with students working all problem sets within the class period.

Example: Total Quality Management

Learning Objectives
- Understand the purpose of supplier quality management.
- Identify and employ techniques of achieving supplier quality.
- Identify and employ the dimensions of quality.
- Understand the purpose of process mapping.
- Employ the process of process mapping.

Problem Set #1
Scenario: The Doggie Day Care is a local daily canine pet kenneling service that has been in business for a year or so. The steps that outline the current process for pet pickup at the end of the day:

1. When the customer arrives, they check in at the front desk.
2. The desk clerk notifies the kennel master by radio that the customer has arrived to pick up a specific pet.
3. The kennel master notifies the assistant handler, usually in person, that a specific pet is ready for pickup.
4. The assistant handler calls the front desk, usually by radio, to verify that the pet is indeed ready for pickup.
5. The desk clerk verifies that the pet is ready for pick up.
6. The assistant handler brings the pet to the front desk.
7. The assistant handler meets with the customer to debrief how the pet's day went.
8. The desk clerk ensures the customer has paid all outstanding bills.
9. The customer leaves with the pet.

Prompts: Map the current process.
- Discuss areas in the current process in which workers might be making errors.
- Discuss areas in the current process in which workers might be wasting time.
- Identify three ways in which the current process can be simplified or improved.
- Map a recommended future process.

Problem Set #2
Scenario: Joan is the production manager for BoxTop, a container manufacturer. Over the past five weeks, Joan has received a high number of complaints from her customers; it seems that boxes are breaking during shipping and distribution.

Prompt:
- Describe the actions Joan should take to address this problem.

Problem Set #3

Scenario: Jim is the assistant sourcing director for BoxTop, a container manufacturer. The sourcing director and President for BoxTop have chosen Duraline as their new supplier for the type of paper required to manufacture cardboard boxes. Jim is charged with ensuring that the paper Duraline provides is quality, and that Duraline and BoxTop have a quality relationship.

Prompts:
1. Evaluate each potential action below individually towards its ability to address the situation above. Label each using the following: '5'=highly effective, '3'=mildly effective, '1'=not effective.

- Jim should seek to drive Duraline's price for cardboard down to be as low as possible.
- Jim should sample large quantities of Duraline's cardboard to see if they meet production needs.
- Jim should visit Duraline's production facility.
- Jim should ensure Duraline understands BoxTop's definition of quality.
- Jim should find several suppliers, other than Duraline, in order to create competition.
- Jim should work with Duraline to establish a supplier scorecard system that measures critical points of performance, such as on-time delivery, damaged loads, billing accuracy and order cycle time.
- Jim should coordinate Duraline's visiting the BoxTop facility, to receive a full tour of the container production process.
- Jim should establish audits of the Duraline production facility.
- Jim should require Duraline to be certified by ISO 9000 standards.

2. For each of your ratings above, justify your evaluation with several sentences. Explain why you think this action would or would not be effective.

Teaching Service Quality Assessment through Project-Based Learning

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ABSTRACT

Teaching service quality assessment to undergraduate business students is a challenge. While personal experience may provide partial meaning and insight to the nature of customer perspectives, students may become lost in the details of developing, measuring and analyzing customer experiences as a function of business management. To address these challenges, this article provides a project-based learning method in which students employed the SERVQUAL method to construct survey questions, collect data, and identify gaps between fellow students' expectations and perceptions of education received. Students performing the project gained a deeper understanding of how to analyze customer feelings regarding service quality and how to apply the SERVQUAL method in future settings. Additionally, students gained an increased appreciation for the value of service quality assessment.

Keywords: Service Quality Assessment, Project-Based Learning, SERVQUAL, Experiential Learning, Total Quality Management, Business Management

INTRODUCTION

By the time they reach college, most undergraduate business students have had some sort of occupation, often within the service industry. However, teaching undergraduate business students how to assess quality within the service industry is a challenge. While students may have encountered individual customer complaints in past work experience, students may lack the overall context of assessing quality as a system of business management within the service industry.

The purpose of this paper is to address this challenge by providing a project-based learning method of teaching undergraduate students the process of service quality assessment. Project-based learning, an experiential learning approach, has been found to provide context that may have been missing, enabling students to achieve a greater depth of understanding (Jin, Wu, Cunningham, and Chinta, 2015; Wathen and Rhew, 2019; Conklin and Boulamatsi, 2020; Calvert, 2021). For this project-based approach, students were taught the SERVQUAL method of assessing service quality to identify gaps between customer expectations and perceptions (Parasuraman, Zeithaml and Berry, 1988). The students performing the project administered the SERVQUAL to a group of students in another course, under the framework of students being customers and the course's instructor being the service provider (Stodnick and Rogers, 2008). Administering the SERVQUAL required the students performing the project to develop the required surveys, collect and analyze the results, and provide an overall assessment of service quality, to include identifying areas of sustainment and improvement for the course's instructor.   Through completing this project, the students gained a deeper understanding of the SERVQUAL method and how to assess the quality of service received. Moreover, the students performing the project developed ideas for applying the SERVQUAL in future situations, and gained a greater appreciate for the role of quality assessment within the service industry.

This paper is organized in the following manner: a brief literature review outlines the development of quality assessment within the service industry, the establishment and use of the SERVQUAL method, and the SERVQUAL method's use within higher education to assess quality. Next, the specific instructions describing the project are provided, to include the survey development and analysis of results. Feedback from the students performing the project is included to indicate the project's effectiveness towards the challenge of teaching undergraduate students service quality assessment. Ways in which the project could be expanded for future implementation are discussed within the paper's conclusion.

USING SERVQUAL IN THE SERVICE INDUSTRY TO ASSESS QUALITY

Assessing and improving quality within the service industry has been studied since the development of quality management, becoming most refined from a scientific perspective in the 1980s (Juran, 1951; Deming, 1982). Assessing service quality has been approached by identifying and studying the potential differences, or gaps, that may

exist between customers of a service process and the service providers, as any such gap may contribute to a lapse in service quality. Following this perspective, five potential gaps have been identified and studied. These potential gaps are described in Table 1.

Table 1: Potential Gaps in Service Quality (Foster, 2010)

Gap	Potential Difference Between	
Positioning	Customer expectations	Management perception of customer expectations
Specification	Management perception of customer expectations	Service quality standards of providing company
Delivery	Service quality standards of providing company	Actual service performed by employees
Communication	Customer expectations of service	Marketing communications regarding the service
Perception	Customer expectations of service	Customer perceptions of service received

SERVQUAL is a survey-based method that focuses specifically on the *perception gap*, which is the potential gap between customer expectations of service quality and the perception of how well the service was accomplished (Parasuraman, Zeithaml and Berry, 1988; Parasuraman, A., Berry, L. and Zeithaml, 1991; Parasuraman and Zeithaml, 2002). SERVQUAL has been used in multiple service industries, such as airline, banking, auto repair, healthcare, hospitality, hotel, restaurant, public and professional services, retail, telecommunication, transportation and shipping, travel and tourism, and education (Fink and Ritchie, 1991; Saleh and Ryan, 1991; Bojanic and Rosen, 1994; Min, Min and Chung, 2002; Dawson and Titz, 2011; Zarei, Arab, Froushani, Rashidian and Tabatabaei, 2012).

Within higher education, SERVQUAL has been used rather extensively to assess potential gaps between students and educators (Tan and Kek, 2004; Oliveria and Ferreira, 2009). Within this perspective, students have been viewed as customers and educators as service providers (Stodnick and Rogers, 2008), and positive improvements taken from SERVQUAL analysis have been linked to increased student satisfaction, retention, and enrollment (Chatterjee, 2009; Yousapronpailboon, 2014). As such, SERVQUAL has been employed at the course, department, and institutional levels, at colleges and universities internationally to assess student feelings about quality in education (Oldfield and Baron, 2000; Ramseook-Munburrun, Naidoo and Nundall, 2010; Galeeva, 2016; Wolfe, 2020; Agarwal, Verma and Malhotra, 2021).

While SERVQUAL has been frequently used in higher education to assess teaching quality, it has been used much less as a project-based means to teach students how to assess service quality. Most of the research on SERVQUAL in higher education discusses the results of SERVQUAL administered to students, as opposed to students developing, conducting and analyzing SERVQUAL themselves in order to learn the quality assessment process. Therefore, the following project-based approach was developed and implemented with students as an innovative way to address the challenge of teaching quality assessment to undergraduate business students.

INSTRUCTIONS FOR THE SERVQUAL PROJECT

Introduction

This section describes the development and execution of the project. While there have been many SERVQUAL variations discussed in the literature, the described approach follows the procedures discussed by Foster in *Managing Quality: Integrating the Supply Chain* (2010). As this project involved students and data collection, the research was approved by expedited review by the York College of Pennsylvania IRB Committee (IRB #22SP006, date of approval 2/2/2022, Committee Chair: Steve Jacobs).

Step 1: Assigning the Project

As part of their coursework on assessing service quality, students in a Total Quality Management undergraduate course were provided instruction the SERVQUAL method, as described by Foster (2010). This instruction included an in-class exercise covering the computation and interpretation of survey results.

The students were then introduced to the project's learning objective and requirements:

Learning Objective: Given a group of 23 students as customers and an individual educator as a service provider, apply the SERVQUAL process to assess service quality.

Requirements:
- Develop and administer the Expectation and Perception surveys.
- Compute the results using the one-dimensional and two-dimensional differencing processes.
- Analyze the results, identifying areas for sustainment and improvement.
- Communicate the results in a written paper.

Step 2: Developing the Expectation and Perception Surveys
The students began by designing the Expectation and Perception surveys. Following the SERVQUAL method, the students developed questions for both surveys based on the traditional dimensions of service quality: Tangibles, Service Reliability, Responsiveness, Assurance and Empathy (Foster, 2010). Descriptions of each dimension are provided in Table 2.

Table 2: Dimensions of Service Quality Used in SERVQUAL

Dimension	Description
Tangibles	Appearance of physical facilities, equipment, personnel and communication materials
Service Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	Willingness to help customers and provide prompt service
Assurance	Knowledge, courtesy of employees, ability to covey trust and confidence
Empathy	Provision of caring and individualized attention

The students developed Expectation questions were in a generalized format, addressing instruction in a non-specific manner. While not explicitly identified to the survey participants, questions 1-4 related to Tangibles, questions 5-9 related to Service Reliability, questions 10-13 related to Responsiveness, questions 14-17 related to Assurance, and questions 18-22 related to Empathy. All questions possessed a 7-point Likert scale for survey participants to use, with '7' referring to 'strongly agree' and '1' referring to 'strongly disagree'. After developing the questions, the students sent them to the instructor for review and approval. These are the questions that were used for the Expectation survey:

Tangibles
1. Excellent professors have a well-organized learning management system.
2. Excellent professors have slides that communicate information but are not overwhelming.
3. Excellent professors use handouts to help reinforce course materials.
4. Excellent professors use interactive, physical items during lectures to help explain course materials.

Service Reliability
5. An excellent professor will describe course objectives at the beginning of class, then cover them at the end to show they were reached during instruction.
6. An excellent professor will be knowledgeable about the topics they are teaching.
7. An excellent professor will have all assignments posted and available on the learning management system.
8. An excellent professor will cover the course objectives stated in the syllabus.
9. An excellent professor will be present for stated office hours.

Responsiveness
10. An excellent professor will respond to emails quickly.
11. An excellent professor will call students when they raise their hand in a timely manner.
12. An excellent professor will slow down teaching if students are confused.
13. An excellent professor will follow up when the student has a question outside of class time to ensure understanding of course material.

Assurance
14. An excellent professor will provide instruction so that students feel confident before their exam.
15. An excellent professor is confident in his abilities to teach students.
16. An excellent professor describes relevant personal experiences in the content area to further enforce understanding of course material.

17. An excellent professor, when lecturing, will show their understanding of the content area by not simply reading from slides but incorporating outside examples.

Empathy
18. An excellent professor will excuse students who are not feeling well.
19. An excellent professor will support students who are frustrated or find a topic difficult to understand.
20. An excellent professor will adjust the classroom lighting if requested by students.
21. An excellent professor will ask students how he can be more effective as a professor.
22. An excellent professor will respond to requested changes to the way a course is taught.

After receiving the instructor's approval on the Expectation Survey questions, the students used these questions to develop their Perception Survey. While Perception questions resembled the Expectation questions in terms of the five dimensions of service quality and possessed a 7-point Likert scale for respondents, each Perception question specifically addressed the course instructor's ability, rather than referring to a generic "excellent professor." As with the Expectation questions, the students developed these questions, then sent them to the instructor for review and approval. Below are the questions used for the Perception survey. Of note, in the Perception survey, the instructor's actual name (e.g., "Dr. Shatzkin") was used in place of the "this professor" phrase.

Tangibles
1. This professor has a well-organized learning management system.
2. This professor has slides that communicate information but are not overwhelming.
3. This professor uses handouts to help reinforce course materials.
4. This professor uses interactive, physical items during lectures to help explain course materials.

Service Reliability
5. This professor describes course objectives at the beginning of class, then covers them at the end to show they were reached during instruction.
6. This professor is knowledgeable about the topic.
7. This professor has all assignments posted and available on the learning management system.
8. This professor covers the course objectives stated in the syllabus.
9. This professor is present for stated office hours.

Responsiveness
10. This professor responds to emails quickly.
11. This professor calls on students when they raise their hand in a timely manner.
12. This professor slows down teaching if students are confused.
13. This professor follows up when students have questions outside of class time to ensure understanding of course material.

Assurance
14. This professor provides instruction so that students feel confident before their exam.
15. This professor is confident in his abilities to teach his students.
16. This professor describes relevant personal experiences in the content area to further enforce understanding of course material.
17. This professor, when lecturing, shows understanding of the content area by not simply reading from slides but incorporating outside examples.

Empathy
18. This professor excuses students if they are not feeling well.
19. This professor supports his students if they are frustrated or find a topic hard to understand.
20. This professor adjusts the classroom lighting if requested by students.
21. This professor asks students how he can be more effective as a professor.
22. This professor responds to requested changes to the way he teaches.

Step 3: Administering the Surveys

To administer the surveys, the students were given access to one of the instructor's other courses. The students administered the Expectation and Perception surveys approximately one week apart using the Qualtrics system. To match individual participant Expectation survey results with the respective Perception survey results, the students instructed participants to create login information using the first 3 letters of the street they grew up on, along with the

numerical digits of their birthday. Of the 23 available participants within the course, 18 participated in the survey, of which 14 correctly completed the login data for matching and analysis.

Step 4: Computing and Analyzing Results
The students used one- and two-dimensional differencing to compute and analyze results.

One-dimensional Differencing
From these 14 participants, average response scores were computed for each dimensional category. After computing the Expectation and Perception averages for each dimension, the students compared the respective averages. Perception averages were subtracted from their respective Expectation averages to determine a positive or negative difference. Within SERVQUAL analysis, comparing averages in this manner is known as one-dimensional differencing. A positive difference indicates that the service exceeded expectations of quality, whereas a negative difference indicates that the service did not meet expectations of quality.

$$D_{d = \overline{P_d} - \overline{E_d}}$$

where:

D_d = Difference in a dimension of quality d
$\overline{P_d}$ = Average participant Perception score for dimension of quality d
$\overline{E_d}$ = Average participant Expectation score for dimension of quality d

Except for the Tangibles dimension averages, Perception averages for the other four dimensions surpassed their respective Expectation averages. These results are depicted in Table 3.

Table 3: Results of One-dimensional Differencing

	Perception Average	Expectation Average	Difference	Outcome
Tangibles	5.64	5.73	-.09	Not surpassed
Service Reliability	6.40	6.17	+.23	Surpassed
Responsiveness	6.47	6.02	+.45	Surpassed
Assurance	6.29	6.23	+.06	Surpassed
Empathy	6.12	5.77	+.35	Surpassed

Further exploration of these results revealed that within the Tangibles dimension, average responses on two of the four questions caused the overall Perception average to be lower than the Expectation average. Question #2, concerning slides that communicate information without being overwhelming, received a 6.14 Expectation average with a 5.93 Perception average. Question #3, concerning the use of handouts to reinforce course materials, received a 5.21 Expectation average with a 4.29 Perception average. Based on these findings, the students performing the project recommended the course instructor focus on improving the quality of the course slides and handouts to assist students in learning the material.

Two-dimensional Differencing
The students also analyzed the results using the two-differencing method, which involves plotting the Perception and Expectation averages on a quadrant style graph. The value of this method of interpretation is that it extends beyond the simple findings of the difference between expectations and perceptions. For the service provider, two-dimensional differencing identifies areas of sustainment, potential waste, and improvement.
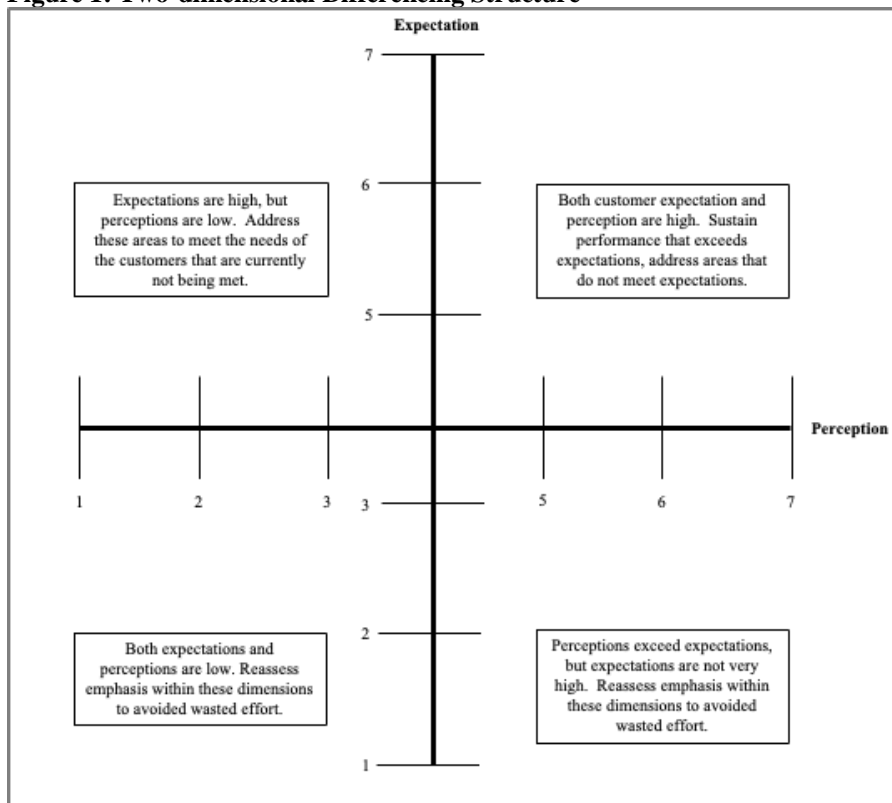
For this method, the respective pairs of averages are plotted on a special diagram, with the Perception average being plotted against the horizonal axis, and the Expectation average plotted against the vertical axis. This two-dimensional differencing diagram is shown in Figure 1, and is composed of four quadrants:

- Instances in which dimensional Perception and Expectation averages are both higher than 4 fall within a "Sustaining Quadrant". Dimensions of quality falling within this quadrant are ones for service providers to emphasize, as customer expectations are high.

- Instances in which dimensional Perception averages are greater than 4 with corresponding Expectation averages less than 4 fall into a "potential waste" quadrant. Dimensions falling into this quadrant would

indicate that customers have low expectations concerning the particular dimension, which are exceeded by their perceptions of the service. While exceeding expectations could be viewed as a positive outcome, it also raises the question of wasted effort on behalf of the service provider, if the particular dimension of service is not valued by the customer.
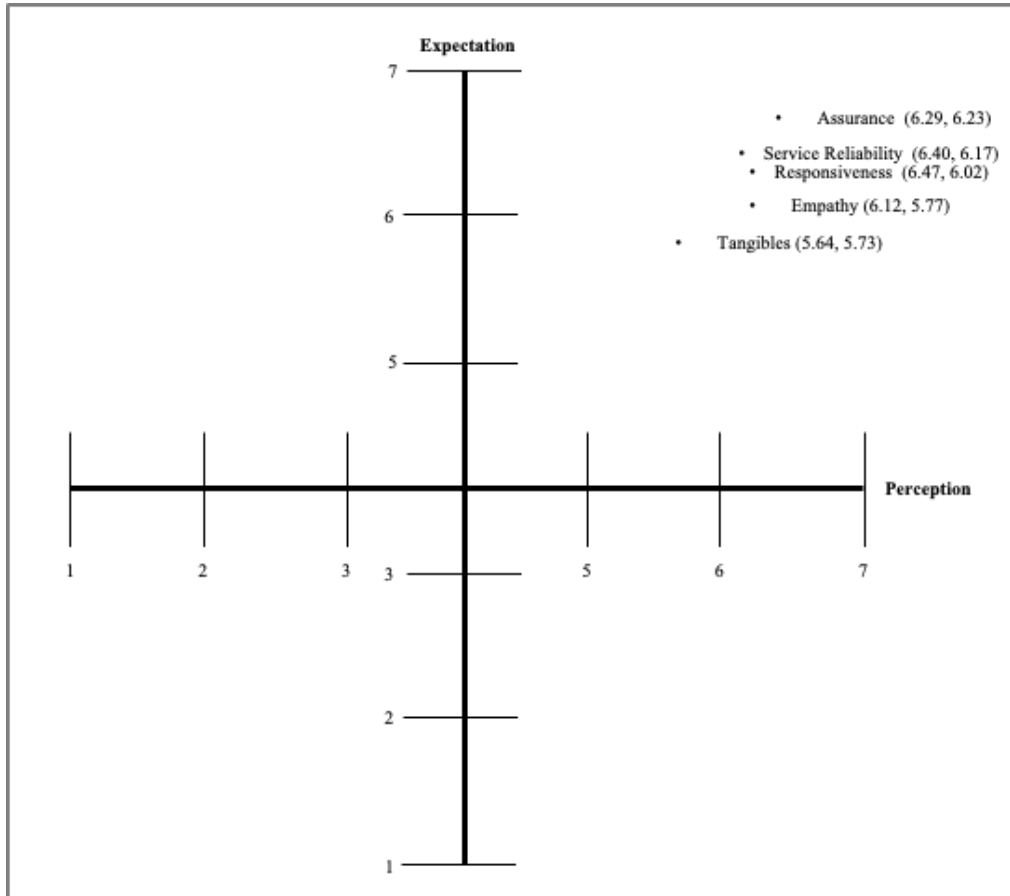
- Instances in which dimensional Perception averages fall below 4 with corresponding Expectation averages also below 4 indicate areas that are not valued by the customer, and therefore should not be given additional emphasis or priority.

- Instances in which dimensional perception averages fall below 4 with corresponding expectation averages falling above 4, in contrast to the quadrant discussed above, indicate areas in which customer expectations are both high and are not being met. Due to their importance to the customer, the service provider may want to give these areas additional emphasis and priority, in the pursuit of service quality.

Figure 1: Two-dimensional Differencing Structure

For the students' specific results, all dimensional pairs of averages fell within the sustaining quadrant. This indicates that the population studied possessed high expectations for their education across the five dimensions of quality. It also indicates that four of these expectations were met with surpassed expectation averages, with the Tangibles dimension not meeting expectations. Overall, the results indicate that overall performance should be sustained within all dimensions. The two-dimensional differencing results are depicted in Figure 2.

Figure 2: Results of Two-dimensional Differencing

STUDENT FEEDBACK REGARDING THE SERVQUAL PROJECT

Students involved in the SERVQUAL project had positive feedback to report from their experience. Their comments reflected the value in the project-based aspect of learning, as they reflected a further depth of understanding of the SERVQUAL, as well as how the SERVQUAL could be applied in future situations:

"Creating the SERVQUAL project was one of the most in-depth applications of a lesson to solve real problems that I have experienced. In the future, we can use the SERVQUAL approach to help other faculty discover where they may fall short or exceed student expectations."

"The opportunity to participate in creating this project was an eye-opening experience. Prior to taking Total Quality Management, I had a lacked understanding of the importance of ensuring quality at its root- the consumers. With the knowledge I gained from this course and the completion of this project. I recognized and was able to navigate through research-based learning opportunities such as interviewing my peers, analyzing data, and compiling visual evidence that supports the importance of education as a service."

On their own initiative, the students who completed the SERVQUAL project entered their work in the business school's annual research competition. As part of the competition, the students were required to present their project and findings to the competition's panel, and to respond to the panel's questions regarding their findings. During the question and answer portion of their presentation, the students were able to explain the SERVQUAL process, interpret their findings and recommendations, and discuss how quality assessment can provide value within the service industry. As a result of their presentation, the students who completed the SERVQUAL project won first place in the business school's annual research competition.

CONCLUSION

Mainly due to a lack of context and experience, teaching service quality assessment to undergraduate business students can be difficult. To address this difficulty, this paper offers a project-based approach, having students perform the SERVQUAL method to analyze gaps between customer expectations and perceptions of service received. Through developing, collecting, and analyzing the SERVQUAL findings, the students performing the project gained an increased depth of understanding the process of service quality assessment, and developed ideas for assessing service quality in future and different situations.

While this project describes students completing a SERVQUAL using fellow students as the customer and an instructor as the service provider, this overall approach could be expanded or adjusted. Rather than using a single course for the customer population, students could administer a SERVQUAL across a college department or school. Alternatively, students could complete a SERVQUAL for customers in a service industry other than education, providing the instructor can gain access to customers for students to survey. While SERVQUAL was the selected method within this project, there are other methods that could be taught and employed within student projects to build depth of understanding on service quality assessment.

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Using Economic Sudoku to Teach Cost

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ABSTRACT

We provide examples of economic sudoku to enhance student understanding of the relationship between total, average and marginal cost. To create scaffolding, examples of sudoku range from easy to hard. This method allows students with limited math skills to practice simple calculations before being presented with more challenging sudokus. Economic sudoku requires students to do more than just learn a formula; each student learns to work forward and backward using a limited set of information to complete a cost puzzle. This approach develops the intuitive skills that are essential in moving from data presented in tables to cost curves. Gamification of the cost material motivates students to learn, improves their math and graphing skills, and allows them to process information more quickly – skills that are vital to economic understanding. The material is appropriate for high school, AP, principles, and intermediate-level microeconomics.

Keywords: Cost, Sudoku, Education. Active learning.

INTRODUCTION

Sudoku is a puzzle in which missing numbers are filled into a grid under a set of rules. Every sudoku puzzle requires geometric and/or mathematical logic to complete. We adapt the traditional sudoku to economics to help learners understand how costs are calculated and the spatial relationships are graphed.

We review the existing literature in Section I. Games and puzzles have been shown to aid student learning in a variety of disciplines (including economics). The best-known game used to teach cost is the tennis ball game, which is a demonstration of diminishing returns. When teaching costs, instructors should introduce the sudoku exercise before the tennis ball game since it requires students to understand how to fill in an incomplete cost table, whereas the tennis ball game does this automatically with a spreadsheet. The tennis ball game assumes that students know how to calculate costs. We have found that students do not understand the differences between total, average and marginal costs, hence the need for additional scaffolding.

Section II consists of three sudokus (easy, medium and hard) so that students of all abilities can learn costs at an appropriate pace. We also supply a spreadsheet with multiple tabs for instructors to debrief each sudoku by filling in the missing values and generating cost curves.

In Section III, we offer teaching advice based on our teaching experiences.

In Section IV, summarize feedback we received from high school and college instructors after playing economic sudoku at the Symposium on Economic Teaching.

I. LITERATURE REVIEW

"Business Costs" is typically one of the hardest chapters in introductory economics to teach effectively because it is very quantitative. Students tend to get easily bored, and the transition from the formulas to the data to the graphics can be difficult for even experienced instructors to convey (Geerling et al. 2018). Few students have any understanding of what it takes to run a business efficiently. Most students have never considered the amount of money it takes to start and run a business, so the language of cost (average cost, fixed cost, marginal cost, total cost or variable cost) is foreign to them. In recent years, a handful of active learning techniques have been introduced to make the teaching of business cost resonate with students, ranging from games to the use of pop culture. The "Tennis Ball Game" (Hedges,

2004) provides real time data that a lecturer can enter into an excel spreadsheet to show the connection between profits, costs and diminishing returns.[1]

Puzzles of all types, including jigsaw, crossword, brain teasers and sudoku have become an increasingly popular medium in the classroom (Walstad and Bosshardt, 2020). These puzzles challenge the mind by testing people's memory, cognitive thinking, and problem-solving skills as they seek a correct solution. Puzzles are useful teaching tools in economics (Lin and Durphy, 2013; Nalebuff, 1990) and in other university subjects (Franklin et al. 2003; Raines 2010). In "Using Simplified Sudoku to Promote and Improve Pattern Discovery Skills Among School Children", Tengah (2011, p. 53) highlights the main benefits of using sudoku puzzles in learning: "It strengthens the mathematical skills that are required to solve such puzzles, which include trial and error, guess and check, logical reasoning, narrowing down of choices, looking for patterns, the process of elimination, and others." Due to the flexibility and its rich mathematical application, sudoku has been employed as a teaching medium in different levels and branches of mathematics (Snyder, 2010) but also in other subjects including chemistry (Crute & Myers, 2007) and computer science (Lambert, Monfroy & Saubion, 2006).

Using in-class activities is a pedagogical method designed to promote active learning. Snee et al. (1993) found that this teaching technique can be useful in improving student attendance and engagement. Involving students in data collection can pique their interest in the topic of data from early on (Cummiskey et al. 2012). Brophy and Hahn (2014) describe an experiment which takes approximately 15-20 minutes to run and involves students completing one of four types of sudoku puzzles and recording the time it takes to complete. The resulting data set can be used as a teaching tool in statistics: from introductory level right through to advanced courses. Ernstberger and Venkataramanan (2018) present an engaging, in-class exercise that introduces genetic algorithms as well as advanced excel functions by modeling a sudoku puzzle. In a meta-analysis of the effects of game-based learning, Wouters et al. (2013) found that the use of games is more effective in enhancing learning and motivation when coupled with other instructional methods such as working in groups. Games resonate with students because they are interactive and provide students with the intuition to be able to understand the material at a deeper level.

By adding sudoku to the repertoire of teaching mediums, this paper will help address the lack of active learning teaching used to teach business costs, while contributing to the literature on gamification. Gamification of cost material motivates students to learn, improves their math and graphing skills, and allows them to process information more quickly – skills that are vital to economic understanding and one of the early building blocks in developing graduate attributes for life beyond university.[2]

II. Using Economic Sudoku to Teach Cost

In this section we describe how to use economic sudoku to help students learn about cost. We provide three examples of economic sudoku (easy, medium and hard). If your student cohort needs scaffolding, we recommend that you start with an easy or medium economic sudoku before challenging your cohort with the hard sudoku. The sudokus provided are designed to be worked on in groups with a binding time constraint. Each group is encouraged to problem solve and utilize calculators to complete a sudoku. We provide students with definitions and the formulas for fixed cost (FC), variable cost (VC), total cost (TC), average fixed cost (AFC), average variable cost (AVC), average total cost (ATC) and marginal cost (MC) in advance. An Excel sheet with the formulas, data and charts is available by contacting Dirk Mateer at dmateer@utexas.edu.

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[1] The tennis ball game has been used in many classrooms across the world and is available on YouTube; see https://www.youtube.com/watch?v=5cU5AgcynRM

[2] Kris Nagy, an education designer at Monash, provided some help with the literature review.

Easy Sudoku

Recommended time to complete: 2 minutes.

Recommended audience: high school students, students with low math skills, general business courses

1. Distribute the formulas.
2. Distribute the following sudoku:

Q	FC	VC	TC	AFC	AVC	ATC	MC
1	200		500	200	300	500	500
2	200	400	600	100	200	300	100
3		450	650	66.67	150	216.67	50
4	200	480	680		120	170	30
5	200	550	750	40	110		70
6	200	700	900	33.33	116.67	150	
7	200	1000	1200	28.57		171.43	300

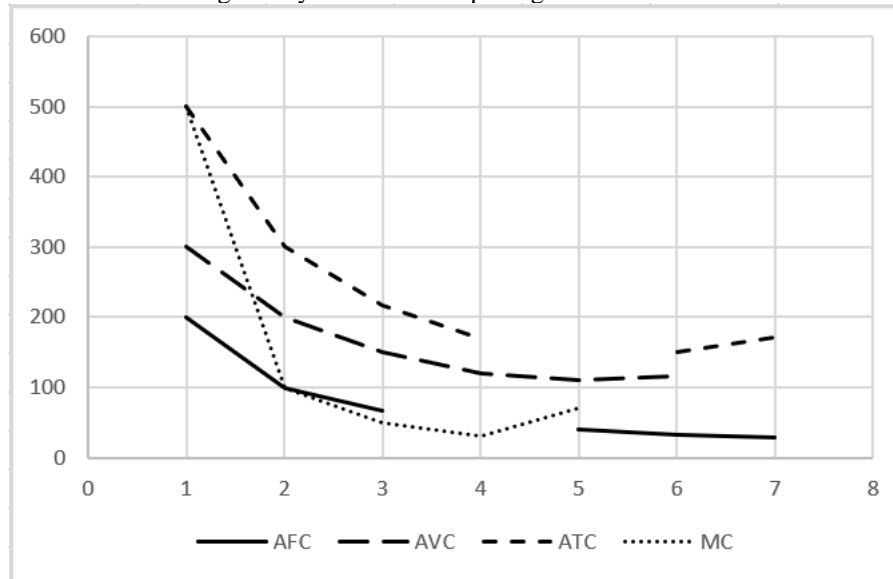Ask each group to fill in the missing values as quickly as possible.

3. Start a countdown timer and display on screen.
4. Collect the answers.
5. Carefully explain how each answer was calculated (or have volunteers provide the answers).

See Appendix I for a detailed explanation.

6. Using the provided Excel sheet, enter each answer into the table.
7. a. As you enter the answers, the chart provided automatically updates the related chart.

Ask your students what they notice about the graph. Many will observe the points below on their own and guide the discussion. This encourages them to discover the relationships between the costs rather than simply being told.

b. Point out that AFC declines as Q increases.

c. Point out that AVC and ATC converge as Q increases.

d. Point out that MC crosses through the minimum points of ATC and AVC.

e. This is the starting chart you will be completing:

8. Ask your students if they are ready for a slightly harder challenge!

Medium Sudoku:

Recommended time limit to complete: 4 minutes

Recommended audience: high school students, AP and Principles students, general business courses.

1. Distribute the formulas.
2. Distribute the following sudoku:

Q	FC	VC	TC	AFC	AVC	ATC	MC
1		150	300	150			300
2	150				100	175	
3		225		50	75		25
4			410			105	35
5	150	325		30		95	
6		500	650	25	83.33		175
7	150		900		107.14	128.57	

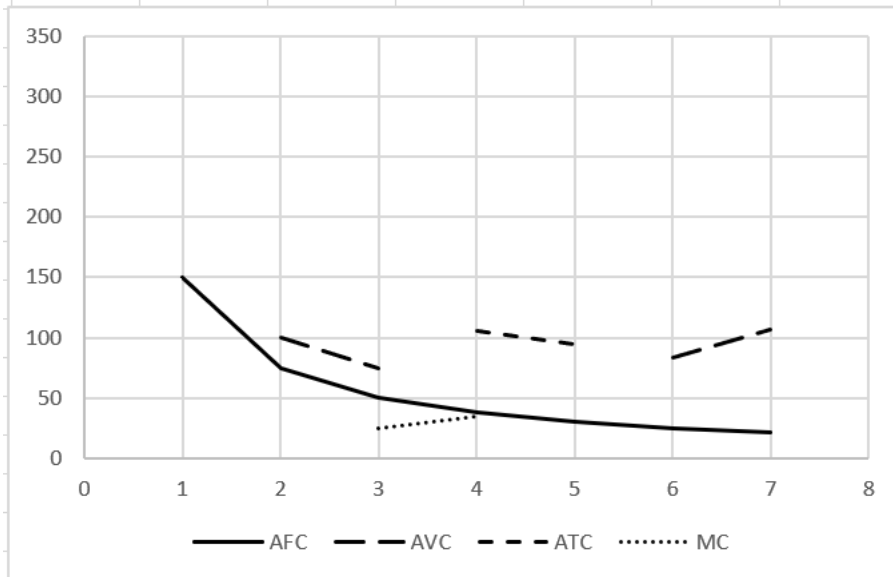Ask each group to fill in the missing values as quickly as possible.

3. Start a countdown timer and display on screen.
4. Collect the answers.
5. Carefully explain how each answer was calculated (or have volunteers provide the answers).
See Appendix I for a detailed explanation.
6. Using the provided Excel sheet, enter each answer into the table.
7. a. As you enter the answers, the chart provided automatically updates the related chart.
Ask your students what they notice about the graph. Many will observe the points below on their own and guide the discussion. This encourages them to discover the relationships between the costs rather than simply being told.
b. Point out that AFC declines as Q increases.
c. Point out that AVC and ATC converge as Q increases.
d. Point out that MC crosses through the minimum points of ATC and AVC.
e. This is the starting chart that you will be completing:

8. Ask your students if they are ready for a slightly harder challenge!

Hard Sudoku:

Recommended time limit to complete: 6 minutes

Recommended audience: Principles students with strong math skills, Honors sections of Principles, Intermediate students. general and intermediate business courses.

1. Distribute the formulas.
2. Distribute the following sudoku:

Q	FC	VC	TC	AFC	AVC	ATC	MC
1			520				
2				60			200
3					240		
4						230	
5		850					
6							110
7			1380				

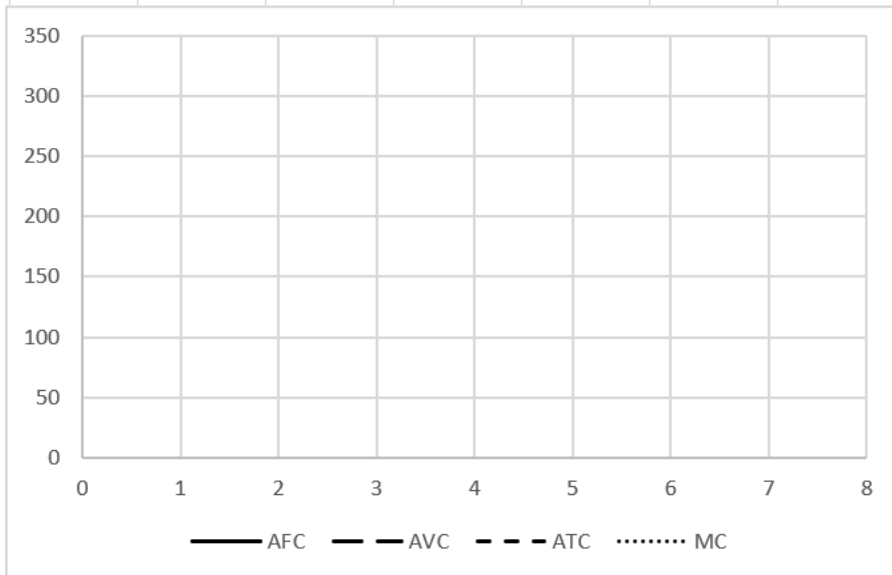Ask each group to fill in the missing values as quickly as possible.
3. Start a countdown timer and display on screen.
4. Collect the answers.
5. Carefully explain how each answer was calculated (or have volunteers provide the answers).
See Appendix I for a detailed explanation.
6. Using the provided Excel sheet, enter each answer into the table.
7. a. As you enter the answers, the chart provided automatically updates the related chart.
Ask your students what they notice about the graph. Many will observe the points below on their own and guide the discussion. This encourages them to discover the relationships between the costs rather than simply being told.
b. Point out that AFC declines as Q increases.
c. Point out that AVC and ATC converge as Q increases.
d. Point out that MC crosses through the minimum points of ATC and AVC.
e. This is the starting chart you will be completing:

III. Other Considerations:

In this section we offer advice based on our experiences.

The first piece of advice is to be enthusiastic. Let your students know they are about to participate in a timed group sudoku. Mention that a sudoku is a math and logic puzzle to set expectations. Remind the class that they can use a calculator. Use a countdown timer so each group knows how much time is left.

The activity is purposefully time constrained. Students use logic and understanding of the relationships between different costs to complete the puzzle in the allotted time. Initially, students may struggle to complete the sudoku before their time is up while they are developing their understanding of these relationships. We find that many students struggle on the first sudoku they tackle but improve significantly by the time they've worked through more than one and see the problem on a quiz or exam. This very tangible evidence helps them see their progress and experience the satisfaction of aptly solving a problem they once thought impossible to complete within the constrained time.

We recommend that you initially integrate the activity into your grading as a small stakes assignment before including it on a quiz or exam.

This activity is designed to scaffold so that your students can eventually do the hard sudoku. However, you need to be prepared for a collective "gasp" when your students first see the hard sudoku table. Many groups will be initially flustered and will not know how to proceed. Roam the classroom, offer encouragement, and if a group seems stuck offer useful advice to get the group engaged.

We utilize Google forms to collect data. Google forms allows the instructor to stop accepting submissions when time is up. Google will also automatically grade the responses and you can display how many students were able to answer each question correctly.

If time allows, students may graph the points in the sudoku on their own rather than using the provided Google sheet. This activity gives students time to observe how each cost curve progresses and relates to the others.

IV. Feedback

On August 6, 2022 we presented economic sudoku to 21 educators. The participants were given the choice of completing a medium or hard sudoku as part of the session. We collected feedback immediately after completing the session via google forms. Here is a summary of the feedback:

Do you think economic sudoku would help your students learn the relationship between total, average, and marginal cost? *100% agreed. 81% strongly agreed.*

Do you think economic sudoku will help students understand the mathematical relationships between AVC, ATC and MC? *100% agreed. 57% strongly agreed.*

Do you think economic sudoku will help students understand that AFC continually declines as the quantity produced increases? *100% agreed. 71% strongly agreed.*

Here are some of the comments shared with us by the participants:

Very interesting! Thank you! Love this! I really like the timed element of the activity. Thanks for sharing! I can see why this is a great precursor to the tennis ball game. That game will be way more meaningful after this exercise. I always enjoy the hands-on activities. Great session! Loved it! Fun. Great exercise!

V. CONCLUSION

The business costs section of principles of microeconomics is one of the hardest sections to learn. Economic sudoku is a powerful way to introduce students to cost calculations, cost curves and the relationship between total costs, average costs, and marginal cost. Scaffolding the sudokus from easy to hard allows students to master the math, formulas, and intuition for the cost curves – setting them up for success as they progress in micro.

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APPENDIX: Detailed Answers for each Sudoku

The answers are ordered by column beginning with FC.

Easy Sudoku:

FC at Q = 3:	FC is 200 (FC is always the same no matter the quantity produced.)
VC at Q = 1:	VC = 500 -200 = 300
AFC at Q = 4:	AFC = 200/4 = 50
AVC at Q = 7:	AVC = 1000/7 = 142.86
ATC at Q = 5:	ATC = 750/5 = 150
MC at Q = 6:	MC = 900 – 750 = 150

Medium Sudoku:

FC at Q = 1,3,4,6: FC is 150 (FC is always the same no matter the quantity produced.)
VC at Q = 2:   VC = 100 * 2 = 200
VC at Q = 4:   VC = 410 – 150 (FC is constant) = 260
VC at Q = 7:   VC = 900 – 150 (FC is constant) = 750
TC at Q = 2:   TC = 150 + 200 (determined above) = 350
TC at Q = 3:   TC = 150 (determined above) + 225 = 375
TC at Q = 5:   TC = 150 + 325 = 475
AFC at Q = 2:   AFC = 150/2 = 75
AFC at Q = 4:   AFC = 150 (determined above)/4 = 37.50
AFC at Q = 7:   AFC = 150/7 = 21.43
AVC at Q = 1:   AVC = 150/1 = 150
AVC at Q = 4:   AVC = 260 (determined above)/4 = 65
AVC at Q = 5:   AVC = 325/5 = 65
ATC at Q = 1:   ATC = 300/1 = 300
ATC at Q = 3:   TC = 150 (determined above) + 225 = 375, ATC = 375/3 = 125
ATC at Q = 6:   ATC = 650/6 = 108.33
MC at Q = 2:   MC = 350 (determined above) – 300 = 50
MC at Q = 5:   MC = 475 (determined above) – 410 = 65
MC at Q = 7:   MC = 900 – 650 = 250

Hard Sudoku:

FC at Q = 1-7:   This might seem impossible but it is not. The AFC is = 60 when the Q = 2. Therefore, the FC at Q = 2:
                TC = 60 *2 = 120. Since FC is constant, the entire FC column can be filled in with 120.
VC at Q = 1:   VC = 520 – 120 (determined above) = 400.
VC at Q = 2:   The MC at Q = 2 is 200, so the TC = 520 + 200 = 720. Therefore, VC = 720 – 120 = 600.
VC at Q = 3:   AVC = 240, so VC = 240 *3 = 720.
VC at Q = 4:   ATC = 230, so TC = 230 *4 = 920. Therefore, VC = 920 – 120 = 800.
VC at Q = 6:   We know that MC = 110 and that VC when Q = 5 is 850. Therefore, VC = 850 + 110 = 960.
VC at Q = 7:   VC = 1380 – 120 = 1260
TC at Q = 2:   TC = 120 + 600 = 720
TC at Q = 3:   TC = 120 + 720 = 840
TC at Q = 4:   TC = 120 + 800 = 920
TC at Q = 5:   TC = 120 + 850 = 970
TC at Q = 6:   TC = 129 + 960 = 1080
AFC at Q = 1:   AFC = 120/1 = 120
AFC at Q = 3:   AFC = 120/3 = 40
AFC at Q = 4:   AFC = 120/4 = 30
AFC at Q = 5:   AFC = 120/5 = 24
AFC at Q = 6:   AFC = 120/6 = 20
AFC at Q = 7:   AFC = 120/7 = 17.14
AVC at Q = 1:   AVC = 400/1 = 400
AVC at Q = 2:   AVC = 600/2 = 300
AVC at Q = 4:   AVC = 800/4 = 200
AVC at Q = 5:   AVC = 850/5 = 170
AVC at Q = 6:   AVC = 960/6 = 160
AVC at Q = 7:   AVC = 1260/7 = 180
ATC at Q = 1:   TC = 520/1 = 520
ATC at Q = 2:   ATC = 720/2 = 360
ATC at Q = 3:   ATC = 840/3 = 280
ATC at Q = 5:   ATC = 970/5 = 194
ATC at Q = 6:   ATC = 1080/6 = 180
ATC at Q = 7:   ATC = 1380/7 = 197.14
MC at Q = 1:   MC = 520 – 0 = 520
MC at Q = 3:   MC = 840 – 720 = 120
MC at Q = 4:   MC = 920 – 840 = 80
MC at Q = 5:   MC = 970 – 920 = 50
MC at Q = 7:   MC = 1380 – 1080 = 300

Retiring in 40 years? Start Saving Now!
An In-Class Spreadsheet Exercise for Business Students on Modeling 401(k) Benefits

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ABSTRACT

An introductory management information systems course includes several modules on developing spreadsheet skills. One of the in-class exercises is creating a spreadsheet that projects expected year-by-year balances and lifetime savings in an employer-provided 401(k) plan. Because many students now work in jobs that offer 401(k) plans, helping students understand the importance and benefits of saving now (and reaping the rewards of doing so every year) enables them to comfortably retire later. This paper introduces motivation for saving for retirement in a tax-advantaged 401(k) savings plan, defines some pertinent personal finance terms and describes a basic spreadsheet activity that can be developed to enhance student spreadsheet skills while encouraging them to contribute to their own 401(k) (or other similar) savings plans.

Keywords: spreadsheet, 401(k), management information systems, personal finance, time value of money, investing, retirement, savings

INTRODUCTION

Students are being bombarded with a lot of negative news that impacts their thoughts on personal finances. With the amount of student loan debt approaching $1.6 trillion (Federal Reserve Bank of New York, 2022), interest rates increasing by the most in over 20 years (Horsley, 2022), inflation increasing to the highest rates in over 40 years (Rubin, 2022c), the possibility of some student loan debt being forgiven (Rubin, 2022a), the rise in interest in volatile alternative investments like crypto currencies and non-fungible tokens, and the stock market's growth post-Covid-19 pandemic now seemingly in question, this is an opportune time to introduce students to the important concept of saving for retirement even (and especially) when economic outcomes appear chaotic. Furthermore, defined *contribution* plans (of which a 401(k) plan is one example), rather than defined *benefit* plans (e.g., company pension plans), are now the most common retirement plans. However, a 401(k) option may not be offered at a student's employer but the concept of saving in a defined contribution plan remains the same, regardless of plan offered. Other tax-advantaged defined contribution plan types are offered by some government employers or non-profit organizations. These include 401(a), 403(b), 457(b), and the federal government's Thrift Savings Plan (TSP). Individual IRA plans are also available outside of the employer-employee relationship.

Many students are understandably concerned that their student loan debts have gone up even while many student loan payments were suspended during the Covid-19 pandemic (Rubin, 2022b). Also, with 401(k) plans typically being the employee's responsibility rather than the employer's, students should become more familiar with the options offered in their plans. Student concerns impact how much future take home pay can – and will - be allocated to daily needs like food and shelter and wants like entertainment and travel. These concerns are reasonable but at the same time students must understand that they cannot delay saving for retirement – even if retirement is 40+ years into their future.

BACKGROUND

In 1978, Congress passed the Revenue Act of 1978 that included the 401(k) savings plan provision giving employees a way to defer compensation, tax-free (Congress.gov, 1978). On January 1, 1980, the law went into effect and companies could began to offer plans in the United States. By 1983 nearly half of all large firms offered or planned to offer a 401(k) plan and, as of June 2021, total assets in 401(k) plans in the United States was nearly $7.3 trillion (Statista.com, 2022). Defined contribution plans have numerous rules and regulations that both employers and employees must follow. These can include contribution maximums, minimum employee age at withdrawal without penalty, early withdrawal penalties, taxation, investment fund availability and fees, among others. In 2022, the

maximum contribution into an employer-sponsored 401(k) is $20,500 (IRS.gov, 2021). Employees 50 years and older can contribute additional "catch-up" funds. Many employers will also match employee contributions up to a specified amount determined by the company's benefit plan. Thus, employer contributions amount to "free money" placed into the employee's 401(k) savings account.

For example, if an employee contributes 6% of their pay, an employer might match half of that contribution. In this scenario, the employee must contribute at least 6% to get the maximum employer match. If the employee contributes more than 6% the employer will not match more than half of the first 6%. Meanwhile, a different employer may match employee contributions dollar-for dollar up to a stated maximum. There are various matching options offered across the spectrum of employers and employers offering better matching programs can use their 401(k) plan benefits when trying to recruit new employees. In most scenarios, employees should contribute at least enough to get the maximum employer amount. Again, this is "free money" deposited in the employee's 401(k) account.

Given the various 401(k) matching terms offered by different employers, a spreadsheet can be developed to model employee contributions and employer matches such that the student can easily see how the time-value of money – especially when saving in a tax-advantaged account for a distant future retirement – can be a powerful incentive for saving now. While many complexities could be introduced into a 401(k), personal finance, or investment discussion, the purpose of this exercise is to get students to understand saving now for retirement later. As one business news site suggested, "Pay yourself now so you can live later" (BusinessInsider.com, 2012)

Students should understand not only how their employee contributions and employer matching contributions will grow tax free in a 401(k), but also should be aware how that tax free growth allows them to withdraw from their savings in retirement. Cooley, Hubbard, and Walz developed an influential paper to determine the sustainable withdrawal rates based on portfolio return data (Cooley et al., 1998). Their study (typically referred to as "The Trinity Study" because the authors were professors at Trinity College) used simulations based on historical data to determine that an initial withdrawal rate of 3% to 4% from the portfolio value at retirement would be safe for most retirees for up to 30 years without exhausting retirement savings.

Many critics of the Trinity Study exist – especially in personal finance publications and retirement-focused websites. With the recent surge in people interested in being financially independent and retiring early, or "F.I.R.E", there is increased interest in understanding how much one needs to have saved before retiring. One personal financial site re-ran the Trinity Study simulations to include portfolio returns through 2021. The analysis concluded that the paper's original conclusions (up to 30 years of 4% withdrawals is safe) still hold even with the additional 26 years of data to include all years 1871 - 2021 (Wicht, 2022). However, by simulating for more than 30 years of withdrawals, the site concludes that a rate of about 3.5% is safer. Thus, not only does the amount one has saved matter, but also the withdrawal rate and the number of years one expects to withdraw from those savings.

An overview of 401(k) Plans

Under current U.S. tax law, 401(k) plans have a number of advantages with some disadvantages. These are summarized in Table 1.

Table 1: 401(k) Plan Advantages and Disadvantages

ADVANTAGES	DISADVANTAGES
• *Immediate tax break* - contributions come out of your paycheck before taxes are withheld. • *Employer matching of employee contributions* - Many employers will match your contributions at least partially (for example: 50 cents on the dollar for the first 6 percent saved). • *Tax-deferred growth* – Investments grow without the employee owing taxes each year on capital gains and dividends • *May be able to contribute more into 401(k) than IRA* - When eligible to participate, you can normally contribute much more to a 401(k) than to an IRA.	• *Must be age 59 ½ before withdrawing* - Generally not designed to allow access to funds before age 59 ½ without paying taxes plus a 10% early withdrawal penalty. • *Investment funds are chosen by the employer* – many selected funds are often worse (high-cost funds) than funds available in personal brokerage accounts. • *Employer may change the fund selection* – Employer can change available funds at any time. • *Some risk involved* – Unlike employer-provided pensions, plans are not insured by the Pension Benefit Guaranty Corporation (PBGC). • *Vesting of matching employer contributions may be delayed* - Employer contributions may not become vested (become the property of the employee) immediately.

Summarized from Bogleheads.org (2022)

DEVELOPING THE EXERCISE

Background of the exercise This exercise is targeted to an introductory course on management information systems students across all business fields. The course in which this exercise is conducted is typically a sophomore or junior-level course with students having little experience developing spreadsheets from scratch. During this course, students must create spreadsheets in Microsoft Excel which are then automatically graded through the Cengage MindTap learning platform. Most of these students will have completed a freshmen-level course on basic technology where spreadsheets are introduced. However, many students lack the skills necessary to take an analytical challenge and implement it in a well-developed spreadsheet. Some students will have taken or are currently taking an introductory finance course and may have a beginning understanding of the principles of finance. The exercise is designed so that students who are new to spreadsheets and to personal finance can benefit from this assignment.

Setting up the start sheet Before introducing the exercise to students, the instructor should decide whether to use a "start sheet" or have students create the sheet from scratch. With a start sheet, the instructor can setup the first few steps prior to students accessing the sheet. This might be done in time-compressed situations or to emphasize spreadsheet functions used in this exercise. This exercise is typically introduced about midway through the semester once students have gained some familiarity with Excel functionality. The exercise may also be completed using Google Sheets or other freely-available open-source spreadsheet software. Appendix A is a step-by-step exercise with some suggested enhancements that can be provided as a student handout. Appendix B contains two example screenshots of the exercise inputs and sample results.

Defining terms and an explanation of formulas used in the 401(k) spreadsheet exercise

- *General Terms*
  - **Defined contribution plan –** a retirement savings plan in which the employee or employer (or both) contribute to the employee's individual account. There is no promise of a specific dollar amount of benefits available upon the employee's retirement.
  - **401(k)** – a tax-advantaged defined contribution plan offered to employees. Employees typically contribute to the plan through pre-tax payroll deductions. Many employers match employee contributions. 401(k) is a reference to the section of the U.S. IRS code authorizing and regulating these plans. The employee typically begins withdrawals without penalty at age 59.5. For simplicity in this exercise, we use term "401(k)" since it is commonly known, but the employee savings and employer match concept modeled here also generally applies to other defined contribution plans (e.g., 403(b), 457(b), etc.).
  - **Employer contribution** – the percentage that an employer deposits into the employee's 401(k) account. Also called "employer match" if the employee must contribute an amount before the employer contributes.
- *INPUT Worksheet*
  - **Beginning age** – The student's age at which contributions into the 401(k) plan begin.
  - **Beginning year** - The year the student begins contributing to your 401(k) plan.
  - **Starting yearly salary** - The student's salary the year in which 401(k) contributions begin.
  - **Expected average return** % – the annual average percentage that the employee expects the 401(k) plan to return over the life of contributions. For example, the historical average annual return of a S&P 500 since 1972 is approximately 12.5% (per year) in the 1972-2021 period while a US T-bond return is about 4.4% (per year) in the same period (Damodaran, 2022). Start with a conservative estimate of 4% and then have students change to 7% and 12% and then back to 4% to show how return impacts future balances. The point is to save more now, if possible, so – regardless of volatile actual investment returns – there is more to withdraw from at the retirement date.
  - **Employee contribution %** – Employees choose the percentage of their salary to contribute into the 401(k) plan. Contributions happen before taxes are calculated and thus have the added benefit of also reducing taxes paid by the employee.
  - **Average yearly raise %** – the yearly percentage increase (on average) that the employee expects their salary to rise. (typically 1-5%)
  - **Employer match %** … **of first %** – the percentage of the employee's pay that the employer contributes into the 401(k) account as a percentage of the employer's contribution. For example: 50% of the first 6%.
  - **Maximum $ contribution -** The maximum allowed is set by the IRS and published in late fall each year for the upcoming year. It is $20,500 for 2022 and projected to be $22,500 in 2023. Whatever is entered here is the base amount used for the first year.
  - **Maximum contribution yearly increase %** – the percentage by which to increase the base year maximum contribution and the following years (typically 0-2%).
  - **Withdrawal rate –** The amount that can be safely withdrawn during the first year of retirement and increased by yearly inflation so that the investor will not run out of money before passing away. Based on The Trinity Study results, this is also known as the "4% Rule" since a portfolio consisting of 50% Bonds/50% Equities had a safe withdrawal rate of no more than an initial 4%. (typically 2-4%)
  - **SUMMARY** – This formula uses the input variables to state, in plain English, what is being modeled so students better understand the inputs and results.
    - **D17** ="This means that if you contributed "& (B8*100) &"% of $" & B5 & " into your 401k (or $" &B5*B8 & "), your company matches " & (B10*100) & "% of the first "& (B11*100) & "% of your salary (e.g., [" & (B10 * 100) & "% of " & (B11 * 100) & "% X "&"$" & (B5)&"]) = $" & B11 * B5 * B10 & " in matching contributions in your first year. Thus, you have a total of $" & (B11 * B5 * B10) + (B8 * B5) &" in employee contributions + company matching contributions."

- *401k Projection Worksheet*
  - o **Age** – the **Beginning age** increased by 1 for each row
    - ▪ **A5** = INPUT!$B$3
    - ▪ **A6** = A5 + 1 ; and so forth (copy down)
  - o **Year** – the **Beginning year** increased by 1 for each row.
    - ▪ **B5** = INPUT!$B$4
    - ▪ **B6** = B5 + 1 ; and so forth (copy down)
  - o **Salary** – The **Starting yearly salary** increased by the expected **Average yearly raise %**
    - ▪ **C5** = INPUT!$B$5
    - ▪ **C6** = C5 * (1 + INPUT!$B$9); and so forth (copy down)
  - o **Max Cont Allowed $** – The maximum contribution allowed as increased by the maximum contribution yearly increase
    - ▪ **D5** = INPUT!$B$12
    - ▪ **D6** = D5 * (1 + INPUT!$B$13); and so forth (copy down)
  - o **Actual Contributed %** - The actual % of salary contributed into the 401k. Evaluates if actual $ amount is greater than the **Maximum $ contribution allowed**. If it is greater than the **Maximum $ allowed**, then it limits the contributed % to the **Maximum $ contribution allowed** divided by the salary.
    - ▪ **E5** = IF(INPUT!$B$8 * C5 > D5, D5/C5, INPUT!$B$8); and so forth (copy down)
  - o **Actual Contributed $** - The actual dollar portion of the salary contributed into the 401k. Evaluates if Salary * Actual Contributed % is greater than the **Max $ cont allowed**. If it is greater than the maximum allowed, then it limits the contributed $ to the maximum $ contribution allowed.
    - ▪ **F5** = IF(E5*C5 > D5, D5, E5 * C5) ; and so forth (copy down)
  - o **Match** – The amount of employer match based on the **Employer % … of first %**
    - ▪ **G5** = C5 * INPUT!$B$10 * INPUT!$B$11
  - o **Year-by-year investment value** – Each year-by-year column shows the amount contributed for that year and the uses nested IF functions to evaluate first, if the year on row 4 is equal to the year on the row (in column B). If so, it adds the **Actual contributed $** plus the **Match $.** This is the amount contributed for that year. If the years are different, the second IF evaluates if the year in the column (on row 4) is less than the year on the row (column B). If so, it results in a blank cell. Otherwise, it computes the value of prior values as increased by the **Expected average return %.**
    - ▪ **H5** =IF(H$4=$B5, $F5+$G5, IF(H$4<$B5, "", G5 * (1 + INPUT!$B$7))); and so forth (copy down AND across)
  - o **Cumulative Balance** – sums row 5 through row 64 for each column (column F through column AV). The total expected amount in the 401(k) account overall and for each year. Allows the student to see how the account grows over time with contributions and expected average returns.
    - ▪ **F47** = SUM(F5:F46); and so forth (copy across)
  - o **Expected Value in 40 years** – The total value of the 401(k) account after 40 years given the input variables
    - ▪ **F2** = AV47
  - o **Yearly withdrawal in retirement** – The yearly amount in $ that can be withdrawn using the yearly withdrawal rate % from the input variables
    - ▪ **F3** = INPUT!$B$14 * F2
  - o Years in Row 4
    - ▪ **H4** = B5
    - ▪ **I4** = H4 + 1; and so on (copy across)

- *INPUT Worksheet Formatting*
  - o Input values are formatted as Cell Style "Input" and values are centered
  - o The SUMMARY paragraph is formatted with a yellow background and text is centered.
  - o Dollar values are formatted as "Accounting with no decimal"
  - o Percent values are formatted as "% with 1 decimal"
  - o Age and Year are formatted as numbers, no decimal

- *401K Projection Worksheet Formatting*
  - One option is to tell students to format the worksheet using appropriate cell styles, colors, and fonts of their choosing. Otherwise,
  - The title in A1 is formatted with Cell Style "Title"
  - Cells in the range of C5:G45 are formatted with Cell Style "Calculation"

Excel terms and functions used in the exercise
- **Absolute references** – used to point a reference back to the same cell, regardless of where it is copied. *Example*: $B$7
- **Mixed reference** –a reference in which either the row or the column is fixed, but not both. *Example*: H$4
- **Relative reference** – the default cell reference includes simply the combination of a column and row; copying the formula that includes a relative reference will change the reference *relative to* its initial location. *Example*: F46
- **IF** – allows for logical comparisons between one value and another and produces results depending on the evaluation of that comparison. *Syntax*: IF(logical_test, [value_if_true], [value_if_false])
- **What-if functionality** – Changes the value in one cell to be a specific value and imputes the outcome based on the changed value. Allows for easily trying different scenarios. Below are some scenarios students might simulate to answer "what if" questions.
  - **What expected investment return do I need if I want to have $4,000,000 in expected 401(k) savings in 40 years (all other things remaining the same)?** Click on 401k Projection Cell F2 (Expected Value in 40 years) then go to Data menu > What-If Analysis > Goal Seek

CONCLUSION

Many undergraduate students, as soon-to-be graduates, have little understanding of the long-term value of investing in an employer-provided tax-advantaged plan. Students appreciate this exercise because it focuses on modeling retirement investing concepts that they can apply as soon as they have access to 401k or similar retirement accounts. Even students who are experienced with investing and have access to 401k accounts find the exercise a beneficial one. For example, typical student reflections on the assignment are represented by these responses: "I really enjoyed the extra knowledge and insight of investing money. These are great tips and advice that I wish I had when I was a younger man"; "Money management and investing are all still very useful and needed at any age"; and "I appreciate the teacher gives us the resources that our class can [use] in the future on financial achievement and how to invest our money."

For simplicity, the exercise does not include the beneficial tax impact of 401(k) contributions typically being pre-tax. Students can enhance the analysis by including this and other calculations into the spreadsheet (see Step 17 of Appendix A). The exercise should provide motivation for saving for retirement and defines some pertinent personal finance terms and describes a basic spreadsheet activity that can be further developed to enhance student spreadsheet skills while encouraging them to contribute to their own employer-provided savings plans.

Note: The spreadsheet used in this exercise is available for instructors from the author by emailing byoung9 (at) ggc.edu.

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Appendix A. Step-by-step handout instructions for the 401k Projection Spreadsheet Exercise

1. Open the Excel 401kProjection.xlsx file and enter the following data in the INPUT worksheet:

   - **Beginning age:** 24
   - **Beginning year:** 2024
   - **Starting yearly salary:** 60000
   - **Expected average return %:** 5.0%
   - **Employee contribution %:** 17%
   - **Average yearly raise %:** 2.0%

   - **Employer match %:** 50%
   - **of first %:** 6.0%
   - **Max $ contribution allowed:** 20500
   - **Average yearly max contribution increase %:** 1.0%
   - **Withdrawal rate %:** 4.0%

2. In cells A5 and A6 in the 401k Projection worksheet, enter the following formulas to show Age for each year (remember: do not enter the beginning cell address. This is just to help you know which formula that goes into that cell)

   - A5 = INPUT!$B$3
   - A6 = A5 + 1 ; copy the formula into the range A7:A45

3. In cells B5 and B6, enter the following formulas to show each Year on the left side:

   - B5 = INPUT!$B$4
   - B6 = B5 + 1 ; copy the formula into the range B7:B45

4. In cells B5 and B6, enter the following formulas to show each Year across the top:

   - H4 = B5
   - I4 = H4 + 1 ; copy the formula into the range J4:AV4

5. In cells C5 and C6, enter the following formulas to show the starting salary and as increased each year by the yearly raise %:

   - C5 = INPUT!$B$5
   - C6 = C5 * (1 + INPUT!$B$9); copy the formula into the range C7:C45

6. In cells D5 and D6, enter the following formulas to show the starting maximum contribution allowed and as increased each year by the yearly % increase:

   - D5 = INPUT!$B$12
   - D6 = D5 * (1 + INPUT!$B$13); copy the formula into the range D7:D45

7. In cell E5, enter the following formula to show the actual amount contributed % for each year:

   - E5 = IF(INPUT!$B$8 * C5 > D5, D5/C5, INPUT!$B$8); copy the formula into the range E6:E45

8. In cell F5, enter the following formula to show the actual contributed $ amount for each year:

   - F5 = IF(E5*C5 > D5, D5, E5 * C5); copy the formula into the range E6:E45

9. In cell G5, enter the following formula to show the actual $ match contributed by the employer:

   - G5 = C5 * INPUT!$B$10 * INPUT!$B$11; copy the formula into the range G6:G45

10. In cell H5, enter the following formula to calculate the year-by-year investment value:

    - H5 =IF(H$4=$B5, $F5+$G5, IF(H$4<$B5, "", G5 * (1 + INPUT!$B$7))); copy into the range H5:AV45

11. In cell F47, enter the following formula to calculate the cumulative balance totals:

    - F47 = SUM(F5:F46); copy into the range G47:AV47

12. In cell F2, enter the following formula to calculate the expected portfolio balance after 40 years:

- F2 = AV47

13. In cell F3, enter the following formula to calculate the planned yearly withdrawal $ in retirement:

- F3 = INPUT!$B$14 * F2

14. In cell D17 of the INPUT worksheet, enter the following formula to show in plain English what is being modeled given the input variables (this is a long formula so be careful when typing in):

- D17 ="This means that if you contributed "& (B8*100) &"% of $" & B5 & " into your 401k (or $" &B5*B8 & "), your company matches " & (B10*100) & "% of the first "& (B11*100) & "% of your salary (e.g., [" & (B10 * 100) & "% of " & (B11 * 100) & "% X "&"$" & (B5)&"]) = $" & B11 * B5 * B10 & " in matching contributions in your first year. Thus, you have a total of $" & (B11 * B5 * B10) + (B8 * B5) &" in employee contributions + company matching contributions."

15. Apply the following formatting:

- INPUT worksheet: Input cell style to the ranges B3:B5 and B7:B14
- INPUT worksheet: Note cell style to the D17
- 401k Projection worksheet: Calculation cell style to the ranges F2:F3; C24:G45; and F47:AV47

16. Save your workbook and follow the instructor's direction on how to submit your results.

17. To enhance your analysis, try making changes in the spreadsheet to analyze some of these questions:

- What contribution % is necessary (everything else remaining the same) for you to have $3 million in the 40th year (the last year in the worksheet)?
- Expand the spreadsheet to show projected 401k balances after reducing the yearly withdrawal amount that has increased by a yearly inflation rate. For example, if inflation is 3%, the withdrawal in the second year in retirement would increase the first year's withdrawal amount by the first year of retirement's inflation rate.
- Extending the scenario above and given your input variables, what is the highest withdrawal rate so that you don't run out of retirement funds after 25 years in retirement? 30 years? 40 years? (remember you will no longer be contributing into the 401(k) once you retire).
- Project your yearly expenses (including taxes and healthcare) at age 64. Use What-if Analysis to set the withdrawal amount to that dollar among by changing the withdrawal %. Is that % more or less than 4%?
- What is the lowest expected average return % necessary to meet your projected expenses at retirement given a 4% withdrawal rate? 3.5% withdrawal rate? 3% withdrawal rate?
- If you're currently contributing to a 401(k) plan, enter your own real values into the INPUT worksheet. What does your analysis inform you about your current savings?
- Enhance the analysis by adding the tax rate into the INPUT worksheet and an analysis of how contributing to a 401(k) pre-tax plan reduces your taxes.
- What would your contribution % have to be if you delayed saving until 10 years from now to have the same total you calculated initially? What about if you delayed saving until 20 years from now?
- Think of other ways to enhance this spreadsheet and apply your excel skills to make it happen!

Appendix B. Input Screen & 401(k) Projection results (Example Screenshots)

INPUT VARIABLES

	Value	Description
Beginning age	24	The age at which you start contributing to your 401(k) plan
Beginning year	2024	The year you start contributing to your 401(k) plan
Starting yearly salary	$ 60,000	Your salary the year you start contributing to your 401(k) plan
Expected average return %	5.0%	The expected yearly average return for your portfolio over the life of the investment
Employee contribution %	17.0%	The percentage of your salary that you will contribute each year
Average yearly raise %	2.0%	The percentage that you expect your salary to increase - on average - each year
Employer match %	50.0%	The percentage of your contribution that your employer matches
of first %	6.0%	The maximum percentage of your salary that the company will match
Max $ contribution allowed	$ 20,500	The maxiumim dollars that are allowed to be contributed into the 401(k) in the year you begin
Average yearly max contribution increase %	1.0%	The average yearly percentage increase in the maximum dollar contribution allowed (typically 0-2%)
Withdrawal rate %	4.0%	The yearly withdrawal rate (%), during retirement. (typically 3-4%)

SUMMARY:

This means that if you contributed 17% of $60000 into your 401k (or $10200), your company matches 50% of the first 6% of your salary (e.g., [50% of 6% X $60000]) = $1800 in matching contributions in your first year. Thus, you have a total of $12000 in employee contributions + company matching contributions.

INPUT Worksheet Screenshot

401(k) Projection

Expected value in 40 years: $ 2,055,915

Yearly withdrawal in retirement: $ 82,237

Age	Year	Salary $	Max Cont Allowed $	Actual Contributed %	Actual Contributed $	Match $	2024	2025	2026	2027	2028	2029	2030	2031
24	2024	$ 60,000	$ 20,500	17%	$ 10,200	$ 1,800	12,000	12,600	13,230	13,892	14,586	15,315	16,081	16,885
25	2025	61,200	20,705	17%	$ 10,404	$ 1,836		12,240	12,852	13,495	14,169	14,878	15,622	16,403
26	2026	62,424	20,912	17%	$ 10,612	$ 1,873			12,485	13,109	13,764	14,453	15,175	15,934
27	2027	63,672	21,121	17%	$ 10,824	$ 1,910				12,734	13,371	14,040	14,742	15,479
28	2028	64,946	21,332	17%	$ 11,041	$ 1,948					12,989	13,639	14,321	15,037
29	2029	66,245	21,546	17%	$ 11,262	$ 1,987						13,249	13,911	14,607
30	2030	67,570	21,761	17%	$ 11,487	$ 2,027							13,514	14,190
31	2031	68,921	21,979	17%	$ 11,717	$ 2,068								13,784
32	2032	70,300	22,199	17%	$ 11,951	$ 2,109								
33	2033	71,706	22,421	17%	$ 12,190	$ 2,151								
34	2034	73,140	22,645	17%	$ 12,434	$ 2,194								
35	2035	74,602	22,871	17%	$ 12,682	$ 2,238								
36	2036	76,095	23,100	17%	$ 12,936	$ 2,283								
37	2037	77,616	23,331	17%	$ 13,195	$ 2,328								
38	2038	79,169	23,564	17%	$ 13,459	$ 2,375								
39	2039	80,752	23,800	17%	$ 13,728	$ 2,423								
40	2040	82,367	24,038	17%	$ 14,002	$ 2,471								
41	2041	84,014	24,278	17%	$ 14,282	$ 2,520								
42	2042	85,695	24,521	17%	$ 14,568	$ 2,571								
43	2043	87,409	24,766	17%	$ 14,859	$ 2,622								
44	2044	89,157	25,014	17%	$ 15,157	$ 2,675								
45	2045	90,940	25,264	17%	$ 15,460	$ 2,728								
46	2046	92,759	25,517	17%	$ 15,769	$ 2,783								
47	2047	94,614	25,772	17%	$ 16,084	$ 2,838								
48	2048	96,506	26,030	17%	$ 16,406	$ 2,895								
49	2049	98,436	26,290	17%	$ 16,734	$ 2,953								
50	2050	100,405	26,553	17%	$ 17,069	$ 3,012								
51	2051	102,413	26,818	17%	$ 17,410	$ 3,072								
52	2052	104,461	27,086	17%	$ 17,758	$ 3,134								
53	2053	106,551	27,357	17%	$ 18,114	$ 3,197								
54	2054	108,682	27,631	17%	$ 18,476	$ 3,260								
55	2055	110,855	27,907	17%	$ 18,845	$ 3,326								
56	2056	113,072	28,186	17%	$ 19,222	$ 3,392								
57	2057	115,334	28,468	17%	$ 19,607	$ 3,460								
58	2058	117,641	28,753	17%	$ 19,999	$ 3,529								
59	2059	119,993	29,040	17%	$ 20,399	$ 3,600								
60	2060	122,393	29,331	17%	$ 20,807	$ 3,672								
61	2061	124,841	29,624	17%	$ 21,223	$ 3,745								
62	2062	127,338	29,920	17%	$ 21,647	$ 3,820								
63	2063	129,885	30,220	17%	$ 22,080	$ 3,897								
64	2064	132,482	30,522	17%	$ 22,522	$ 3,974								

>>>insert rows

			CUMULATIVE BALANCE:	$ 638,622	$ 112,698	$ 12,000	$ 24,840	$ 38,567	$ 53,230	$ 68,880	$ 85,573	$ 103,366	$ 122,318
				YEAR:	2024	2025	2026	2027	2028	2029	2030	2031

401k Projection Worksheet Screenshot

Career Decision Self-Efficacy Integrated Into An Undergraduate Business Education Curriculum

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ABSTRACT

Research shows that pro-active interventions as part of undergraduate college courses can improve students' ability to make more informed career decisions and thus become more successful in their personal and professional lives. This case study focuses on undergraduate business students at a four-year liberal arts institution who are enrolled in a Student Professional Development Program as part of the business curriculum. The cohort of students was examined beginning in the Fall of 2016 using pre-test scores (first semester, first year) and concluding in the Spring 2020 with post-test scores (last semester, last year) to determine if confidence levels regarding career decision self-efficacy increased. Data was collected using a self-reporting system and then the scores were compared and analyzed according to the categories of Self-Appraisal, Occupational Information, Goal Selection, Planning, Problem Solving, and CDSE Overall Totals. Active/engaged learning, self-awareness, personal/professional resiliency, mentorship, and goal setting were a few topics focused on in all courses that are part of the SPDP. For this specific cohort, an increase in CDSE ranging from medium to high effect size was achieved in all areas. Addressing these key areas and using purposeful interventions allows for an opportunity to increase a student's ability to make informed career decisions, enhance future career development, and encourage lifelong learning.

Keywords: Career decision self-efficacy, business curriculum, professional development, AACSB, career development

INTRODUCTION

This case study explores a sequence of courses developed within the framework of the Student Professional Development Program and measures of Career Decision Self-Efficacy within an undergraduate Business program. The Business school, an Association for the Advancement of Collegiate Schools Business (AACSB) accredited institution, must meet nine educational standards, four of which focus on "Learner Success" (AACSB, 2022). Standard 4 emphasizes the development of curriculum designed to "prepare learners for desired career outcomes and a lifelong learning mindset" (AACSB, 2022 p. 27). This research was conducted as a longitudinal 4-year case study for a cohort of college business majors comparing CDSE pre-test scores of first year students with CDSE post-test scores of the same cohort of students in their last semester of college.

Student Professional Development Program
The original innovation for what is now the Student Professional Development Program (the "SPDP") had its beginnings as a collaboration between the Office of Career Planning's "Career Development Across the Curriculum Project" and the Department of Accounting in 2001. In designing the SPDP, the strategic plan called for the meeting of the objectives in two areas that many times are kept in separate silos, academic courses, and professional development activities. The purpose of this 4-year academic based program within the School of Business is to better prepare students for entry into practical business environments where they can support the success of the organization while excelling in their personal and professional lives (Williams et al., 2018).

As the program evolved, additional academic courses involving oral and written communications, curriculum outcomes assessments, career exploration, goal setting, and personal growth development were created. The career development process presented in these courses allows students to better understand their choice of majors and career plans based on an assessment of their interests, skills, and motivators. Also included are topics on economic and professional trends and mentoring regarding careers and trends in the job market for students in the School of Business. The four courses that were developed or modified to work together for student growth, engagement, and lifelong learning were:
- MSB 100 – Introduction to Business. An introduction course taken by all incoming first year students which focuses upon the first steps in career exploration and self-efficacy. (1 credit – first year course)

- MSB 250 – Business Communications and Mentoring. A course designed for sophomore students it combines written and oral communications with a business focus. The written communications assessment has utilized the Write Experience software from Cengage to systematically provide all students with the same experience and assessment of writing skills. (3 credits – second year course)
- CARP 412 – Career Planning II. This course provides the students with a traditional career exploration course with a developmental component related to oral communications. This course has been utilized to provide the capstone evaluation in the assurance of learning program in oral communications. (1 credit – third year course)
- MSB 400 – Professional Seminar/Senior Capstone. The final addition to the SPDP was required for beginning with students graduating in 2016 and included a successful professional knowledge component coupled with a capstone career exploration component taught by a member of the Career Planning Office. (2 credits senior capstone course)

AACSB guidance under Standard 4 also encourages active curriculum management which includes elements of on-going innovation, experiential learning, lifelong learning, and societal impact. The SPDP has direct evidence of multiple components of these areas. However, curriculum should also equip learners to continue their learning beyond the formal educational environment. While lifelong learning may be difficult to assess, AACSB encourages institutions to address how the school develops learners sustained intellectual curiosity and critical thinking abilities to take ownership of their learning (AACSB, 2022). This case study examines longitudinal case study of CDSE as one potential measure of this standard.

Career development courses in college

Today, college students face many pressures as they enter post-secondary education and often these pressures can be overwhelming. Freeman stated (2012, p. 154) "undergraduate students are faced with the challenges of trying to determine what their future careers will be at a time when they may not yet have a clear idea of their personal strengths or professional interests." Accordingly, "career questions from friends, roommates, and parents often cause anxiety" (Freeman, 2012, p. 154). Research into the source of this anxiety cites factors including continuously changing economic factors, rapidly advancing technology, and student interest in careers with financial stability (Gallas & Lenz, 2012; Grier-Reed & Skaar, 2010). Reardon et al., (2015) theorize that this anxiety around career decision making may be a contributing factor in today's institutions of higher education's struggle with student retention and persistence to degree completion. Cumulatively, this research illustrates that students today require a unique set of resources to help navigate their academic, personal, and professional lives.

To minimize these concerns, research suggests that increasing a student's career self-efficacy can prove beneficial in a variety of ways. Rottinghaus et al. (2012) found that increased career decision-making self-efficacy is positively associated with career optimism and reduces a negative career outlook. Restubog et al. (2010) found a positive correlation between increased career self-efficacy, academic persistence, and successfully completing an academic program. To study this, researchers had students self-report career self-efficacy and career decidedness six months after initially meeting them. To measure persistence, researchers collected student turnover data from university records 18 months later. Results indicated that students who reported higher career self-efficacy persisted through their academic program. Using surveys and assessment tools to evaluate student responses, career self-efficacy was also found to be positively associated with major satisfaction (Jadidian & Duffy, 2012) and career adaptability (Douglass & Duffy, 2015). Students who believe they have the tools to make occupational choices have the control to make appropriate academic decisions and are more vocationally and academically satisfied (Jadidian & Duffy, 2012). This confidence also allows students to be more adept at solving problems, planning goals, and performing tasks (Douglas & Duffy, 2015). Understanding how important career self-efficacy is to preparing students for a 21st century global workplace, Komarraju et al. (2014, p. 421) leveled the following challenge:

> "Can undergraduate programs address inadequacies in career exploration and career development by providing relevant information and activities to increase students' career self-efficacy and knowledge about careers? Could career uncertainty be reduced by offering a course (or program) to strengthen students' career decidedness and career self-efficacy?"

Offering a credit-bearing career course is an effective strategy to answer these questions, decrease anxiety associated with the question, "what is your major", and give students the confidence to progress from college to career and beyond (Freeman, 2012).

PREVIOUS RESEARCH

As educational researchers are beginning to reframe their thinking about what key elements make students successful in school and beyond, Albert Bandura's (1977) Social Learning Theory emphasizes the importance of observing and modeling behaviors, attitudes, and the emotional reactions of others. In consideration of the many challenges associated with career decision making throughout the college process, Bandura's Social Learning Theory and concept of self-efficacy provides a theoretical basis to further investigate the development of traits related to grit within the context of a classroom career development intervention. Bandura's focus on attention and motivation within Social Learning Theory are further explored in the concept of self-efficacy. According to Bandura (1977), self-efficacy describes a person's belief about his or her ability to perform tasks or behaviors successfully. Individuals develop self-efficacy via four primary sources: performance accomplishments, physiological or emotional arousal, vicarious learning and modeling, and verbal persuasion (Bandura, 1977). Based on these factors, individuals subjectively identify and evaluate these sources of self-efficacy information (Betz, 2000; Bollman, 2009). Performance accomplishments are thought to be primary contributors to the development of self-efficacy beliefs because they are derived from personal mastery of tasks. Repeated successes raise expectations and allow the individual to cope with the impact of intermittent failure (Bandura, 1977). Repeated failures, on the other hand, lower mastery expectations and hamper an individual's level of self-efficacy related to a specific task.

In addition to performance accomplishments, another source which influences self-efficacy information for an individual is psychological or emotional arousal (Bandura, 1977). While emotional arousal provides an individual cues that lead to a specific outcome, self-efficacy expectations may influence how the individual attempts to complete the task, the amount of effort put into the task completion, and the degree of persistence employed toward task completion when faced with obstacles (Bollman, 2009). Betz (2000) emphasized that an individual's self-efficacy beliefs must be associated with behavior to have meaning for the individual. For example, if an individual successfully passes a psychology course, they will perceive that they have the confidence to successfully pass another psychology course.

Bandura (1986) defined perceived capabilities as "types of outcomes people anticipate that depend largely on their judgment of how well they will be able to perform in a given situation" (p. 392). According to Bandura (1997), efficacy beliefs have an impact on effort, persistence, and even the choice of activity to pursue (Wilkins, 2014). Similarly, grit also emphasizes persistence of effort and consistency of interest. Further research regarding self-efficacy illustrates that when an individual's self-efficacy beliefs are applied to academic activities, self-efficacy is a stronger predictor of academic success than standard measures of ability such as intelligence (Usher & Pajares, 2008). According to Bandura (1997), students who have a higher sense of self-efficacy set higher goals for academic achievement. Individuals who set goals create adaptive responses in how they emotionally react when obstacles are encountered (Pintrich, 1990). An adaptive response is characterized by seeking a challenge and persisting in the face of obstacles (Pintrich, 1990). By contrast, individuals with lower self-efficacy tend to use maladaptive responses when they encounter challenges. Carol Dweck (2006) characterized maladaptive responses as avoidance of challenge and low persistence on task completion in the face of adversity and identified this as fixed mindset.

Social learning theory and self-efficacy
According to Albert Bandura's (1977) Social Learning Theory, self-efficacy describes a person's belief about his or her ability to perform tasks or behaviors successfully and suggests that behavior is impacted by experiences and thoughts. The successful outcomes associated with academic success begin before many children even begin formal schooling and continue into adulthood as they contribute to society through employment and community engagement (Zimmerman, 1995). Further research regarding self-efficacy illustrates that when you apply an individual's self-efficacy beliefs to academic activities, self-efficacy is a stronger predictor of academic success than standard measures of ability such as IQ (Usher & Pajares, 2008).

Individuals develop self-efficacy via 4 primary sources; performance accomplishments, psychological or emotional arousal, vicarious learning and modeling, and verbal persuasion (Bandura, 1977). Based on these factors, individuals subjectively identify and evaluate these sources of self-efficacy information (Betz, 2000; Bollman, 2009). Performance accomplishments are thought to be primary contributors to the development of self-efficacy beliefs because they are derived from personal mastery of tasks. Repeated successes raise expectations and allow the individual to cope with the impact of intermittent failure (Bandura, 1977). Repeated failures, on the other hand, lower mastery expectations and hamper an individual's level of self-efficacy related to a specific task (Bandura, 1997).

In addition to performance accomplishments, emotional arousal is another source which influences self-efficacy information for an individual (Bandura, 1977). Emotional arousal provides an individual cues that lead to a specific outcome, but self-efficacy expectations may influence how the individual attempts to complete the task, the amount of effort put into the task completion, and the degree of persistence employed toward task completion when faced with obstacles (Bollman, 2009). Betz (2000) emphasized that and individual's self-efficacy beliefs must be associated with behavior in context in order to have meaning for the individual. While these beliefs may begin to be formed in childhood, they continue to evolve throughout an individual's lifespan as people acquire new skills, experiences, and understanding (Bandura, 1992). Individuals create and develop self-perceptions or judgments of their own capabilities that become instrumental to their future behavior, to the goals they establish, and to the control they exercise over their environments (Bandura, 1977).

Bandura (1986) defined perceived capabilities as, "types of outcomes people anticipate that depend largely on their judgment of how well they will be able to perform in a given situation" (p. 392). According to Bandura (1997), efficacy beliefs have an impact on effort, persistence, and even the choice of activity to pursue (Wilkins, 2014). According to Bandura (1997), students who have a higher sense of self-efficacy set higher goals for academic achievement. Individuals who set goals create adaptive responses in how they emotionally react when obstacles are encountered (Pintrich, 1990). An adaptive response is characterized by seeking challenge and persisting in the face of obstacles. On the other hand, individuals with lower self-efficacy tend to use maladaptive responses when they encounter challenges (Pintrich, 1990). During the college experience, many students have difficulty making decisions about many aspects of their lives, including career (Mackesy, 2013). Osipow (1999) also states that students are often indecisive and unable to successfully negotiate the complex academic and career decision making challenges without professional assistance.

Career decision making and self-efficacy
Approach-avoidance behaviors, as a measure of self-efficacy, can occur within the content and the process of [academic and] career decision-making (Betz, 2004). The content refers to the types of academic majors or career paths a person will attempt, while the process refers to the exploration and decision-making behaviors that lead to making informed academic and career decisions (Betz, 2004). Approach behaviors include the tasks an individual will attempt; avoidance behaviors include those tasks an individual will not attempt (Betz, 2004). An example of approach behavior in academic and career decision-making is an individual's willingness to engage in the self-assessment of interests, strengths, and values. An example of avoidance behavior is the individual's failure to engage or a tendency to put forth little effort in the self-assessment process and occupational exploration.

Avoidance behavior perpetuates low self-efficacy for career decision-making because the individual has no opportunity to experience the positive effects associated with accomplishments as related to the avoided tasks (Betz, 2004). Thus, the individual who avoids engaging in tasks does not experience successes that encourage further progress toward making these decisions. An individual's level of self-efficacy for career decision-making also influences the quality of performance of behaviors associated with the tasks and the degree of persistence an individual employs toward accomplishing the task when faced with obstacles (Bandura, 1977). Even when faced with obstacles common to these decision-making processes, such as meeting the demands of a rigorous educational program, career professionals can predict that students with high self-efficacy expectations will have a better chance of persisting toward their goal.

Career decision-making self-efficacy, originally defined by Taylor and Betz (1983) as the individual's belief that he or she can successfully complete tasks necessary for making career decisions, influences an individual's level of engagement in career exploration activities in that the greater the confidence an individual has in his or her decision-making abilities, the greater the likelihood he or she will actively participate in the career exploration process (Betz & Voyten, 1997; Hackett, 1995; Taylor & Betz, 1983). Self-efficacy beliefs inform not only the range of occupations individuals perceive as viable career options, but also the level of persistence and success that individuals have in their chosen career fields (Hackett & Betz, 1981). Weak self-efficacy beliefs about career decision-making are linked to indecision as well as choice anxiety, which if it rises too high can become overwhelming and impede the process of decision-making (Hackett, 1995). As self-efficacy increases, anxiety responses decrease to useful levels (Betz, 2004).

Betz (2004) suggests a two-part process for improving decision-making self-efficacy. The first step for a student is to explore beliefs about his or her ability to competently make career decisions, to assess the self-imposed limitations already in place, and to focus on the causes of the perceptions that led to the enforcement of those limitations. The second step of this process involves encouraging students to pursue opportunities or experience modeling in areas in

which they have low efficacy. Pursuing a job shadowing experience, an informational interview, or an internship may be examples of such modeling.

Lent et al. (1994) offered a social cognitive method of understanding vocational behavior that was also based on Bandura's foundational work. This method highlights three characteristics of a person that form the core: self-efficacy, outcome expectations, and goals (Lent et al., 1994). Efficacy and outcome expectations were postulated to influence the development of interests and goals, both of which are important elements in the career choice and decision process (Lent et al., 1994). Because self-efficacy is such a crucial aspect of student success, it is important for career professionals to consider the use of tools to determine the level of a student's self-efficacy.

Crites (1978) model of career maturity provided the original authors (Taylor & Betz, 1983) with a framework for the skills required in the career decision-making process. Crites (1978) hypothesized that "good" career decisions will be facilitated by competence with respect to five career choice processes: 1) accurate self-appraisal; 2) gathering occupational information; 3) goal selection; 4) making plans for the future; and 5) problem solving. Because self-efficacy is defined in relationship to competence in specific behavioral domains, Crites' five career choice competencies were used to define the construct of interest within CDSE (Taylor & Betz, 2012).

In the original study that resulted in the development of the CDSE scale, a normative sample of 346 students from a large state university and a private liberal arts college, internal consistency reliability coefficients (alpha) ranged from .86 to .89 for the subscales and .97 for the total score of the CDSE (Taylor and Betz, 1983). Luzzo (1993) reported a six-week test-retest coefficient of .83 for the CDSE total score. Multiple studies were also conducted to ensure content validity and supported the five-factor structure of the CDSE assessment (Gati et al., 1994).

A variety of studies have suggested that CDSE is also closely related to other non-cognitive skills which influence a healthy personality (Taylor & Betz, 2012). Scores on the CDSE Scale have also been found to be moderately related to other measures of self-efficacy such as Osipow and Rooney's (Osipow, Temple, & Rooney, 1993) Task-Specific Occupational Self-Efficacy Scale (TOSS). Other studies, such as Niles and Sowa (1992) examination of 181 college juniors and seniors concluded through a regression analysis that motivation, self-efficacy, occupational choice status, and commitment correlated significantly to career self-efficacy. In Robbins' (1985) validation study of the CDSE scale with 92 undergraduate college students, CDSE scores were the predominant predictor of generalized self-efficacy. Robbins (1985) study found that CDSE was also significantly related to global self-esteem which has a greater influence on overall measure of well-being and psychological health. Lastly, Taylor and Popma (1990) explored the relationships between CDSE and Locus of Control with 203 female and 204 male college students. Lefcourt (1991) established the concept of Locus of Control as the concept of an individual's perceived control and whether it was driven by internal or external facets. Taylor and Popma (1990) reported a correlation of -.30 with Locus of Control, indicating that the more external the Locus of Control, the lower their career self-efficacy. The variety of these research findings show strong support that non-cognitive attributes such as self-esteem, motivation, level of commitment, and Locus of Control play a role in support an individual's beliefs and actions toward achieving a desired outcome.

RESEARCH DESIGN

Study participants were solicited from a small, private, not-for-profit liberal arts college located in Northeast Pennsylvania with a Carnegie classification of Master's Colleges and Universities with an undergraduate population of 2,108 students in 2016. Study participants were fulltime undergraduate college students, between the ages of 18-34 years old at the time of the study. The original sample group was comprised of 160 students enrolled in a one credit Introduction to Business course during the Fall 2016 semester. The data cleaning process entailed assurance of completed voluntary consent forms, completed pretest, and completed posttest data sets. After this process, the total number of participants in the study was 95 students.

This phenomenon-based case analysis was conducted as a longitudinal 4-year case study for a cohort of college business majors comparing self-reported CDSE pre-test scores with first year students and self-reported CDSE post-test score of the same cohort in their last semester before graduation within the MSB 400 – Professional Seminar/Senior Capstone course. 95 students (N = 95) participated in this longitudinal case study. Participants in the case study were the first cohort to matriculate through the 7 credit, Student Professional Development Program within this undergraduate school of business.

DATA COLLECTION

Students pursuing a bachelor's degree in business administration are required to participate in the 7-credit Student Professional Development Program. The Program is integrated into the core courses within the McGowan School of Business and overlays the major program of study. As first year business majors, all students are enrolled in MSB 100 – Introduction to Business. Within MSB 100 all students are administered the Career Decision Self-Efficacy (short form) assessment as an assignment within the first week of classes and this serves as the pre-test data for this case analysis. During the final semester prior to graduation, senior students are enrolled in MSB 400 – Business Capstone course. Post-test CDSE data was collected during the MSB 400 course.

DATA ANALYSIS

The data analysis examined pretest-posttest mean differences within the CDSE scores, including mean scores within the 5 sub-domains within the CDSE assessment. In addition to mean differences, effect size can be calculated, when differences in mean exist, to quantify the effectiveness of an intervention (Sprinthall, 2012). An effect size, when reported as Cohen's d, is considered small at .20, medium at .50, and strong at .80 (Sprinthall, 2012). The overall effect size (Cohen's d = .9233) for the mean CDSE score indicated a strong effect on mean scores of participants within the case study population.

Goal selection (Cohen's d = .6424) and problem solving (Cohen's d = .7458) results indicated medium-stong effect size for case study participants. Within the 5 sub-domains within in the CDSE data, self-appraisal (Cohen's d =.9231), occupational information (Cohen's d = .9637) and planning (Cohen's d = 1.1034) all indicated a strong effect size for case study participants.

Table 1: Career Decision Self-Efficacy and Effect Size
MSB 100 Fall 2016 vs. MSB 400 Spring 2020

	Self Appraisal	Occupational Information	Goal Selection	Planning	Problem Solving	CDSE Total
MSB 100 Fall 2016	3.64	3.61	3.61	3.60	3.56	3.60
MSB 400 Spring 2020	4.23	4.25	4.06	4.32	4.06	4.19
Increase in Score	0.59	0.64	0.45	0.72	0.50	0.59
Cohen's d	0.9231	0.9637	0.6424	1.1034	0.7458	0.9233

DISCUSSION/CONCLUSIONS

This case study explores a sequence of courses developed within the framework of the Student Professional Development Program (SPDP) and measures of Career Decision Self-Efficacy within an undergraduate Business program. The data collected indicated a medium to strong effect size within the 5 sub-domains of the Career Decision Self-Efficacy assessment, with self-appraisal, occupational information, and planning as having the strongest effects. Goal selection and problem solving also has shown medium to strong effects. As the progress of the Student Professional Development Program evolved over time, this case analysis is the first longitudinal study of the cohort of students within the program over their 4 years of study within the business school.

As the SPDP evolved over time, critical components here integrated into the 4 courses as deemed developmentally appropriate for the traditionally aged college undergraduate population. Within the MSB 100 – Introduction of Business course, elements were introduced to help students gain a better understanding of their strengths, interests, and motivators though the administration and interpretation of the CareerLeader© assessment. Students were also introduced to topics related to fixed versus growth mindset, including classroom lessons related to the development of resiliency skills, goal setting, and overcoming setbacks. An introduction to mentoring is also included to outline professional expectations and the development of successful networking skills. This course addressed the expectation around performance accomplishments and how to identify unhealthy behaviors related to high levels of stress and anxiety when obstacles are encountered.

Within the MSB 250 – Business Communications and Mentoring course, which is typically completed during the sophomore year of the undergraduate education, students are trained to become more effective writers and presenters. In addition, they learn to apply these skills to selected career and mentoring activities. Verbal persuasion is also emphasized to help students advocate for themselves and the organizations they will represent in the future. Vicarious learning and modeling are also important components of this course which are assessed through formal mentoring experiences, group writing, and team presentation assignments.

Within the CARP 412 – Career Planning II course, taken during the second semester sophomore year or as a junior, students identify a broad purpose, personal belief, or value which supports their post-graduation career or educational goals. This was also supported by their transferable skills and performance accomplishments as typically identified on a resume or credential list. Extensive occupational information is also researched in a student's desired industry of employment. Students actively engage in exercises to communicate these values and skills in written and oral form while connecting them to the needs of the identified industry of interest.

Within MSB 400 – Professional Seminar/Senior Capstone course, completed during their final semester within their undergraduate program, students review core business concepts to better prepare them for transition into the workplace or graduate school. Students also participate in 6 hours of course content designed to encourage a growth mindset, optimism, gratitude, and the development of resiliency skills to overcome setbacks. The importance of positive relationships is also emphasized through mentoring within each stage of the SPDP beginning in MSB 100 and continuing through the MSB 400 course.

The SPDP provides students with an educational framework to build upon educational experiences throughout their undergraduate business education. By purposefully addressing the key areas within Career Decision Self-Efficacy theory in the SPDP it can provide an example to support learners sustained intellectual curiosity and critical thinking skills. The SPDP also helps to expand the business curriculum to help students continue their learning beyond the formal educational environment. This case study highlights the strategic integration of Career Decision Self-Efficacy within a business curriculum though the SPDP which may be one additional measure of assessment to further develop lifelong learning within an undergraduate business education.

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Integrating a Common Book Reading Assignment into an Introduction to Business Course

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ABSTRACT

Many colleges have a common reading program. This paper looks at one business school's implementation of a common reading program into the school's required Introduction to Business course. The benefits of such a program are outlined, as well as how the common reading is integrated into the course.

Keywords: intro to business, first-year, common reading, shared experiences

INTRODUCTION

Common reading programs have become increasingly popular on college campuses. Such programs range from being a way to enhance the first-year experience to a full campus wide experience (Nadelson and Nadelson, 2012). Grenier (2007) summarized several common reading programs and created a method to classify the books chosen.

Goals of common reading programs

Regardless of the targeted audience, a key goal of such programs is to bring people closer together as a community by assigning a book to read to create a common ground for discussion. Many colleges integrate the book into their first-year orientation programs through small discussion groups. Post orientation, some colleges may opt to further utilize the book throughout the first-year experience by integrating the book into one or more first-year courses and inviting the author to campus for a presentation and Q&A session. (Ferguson, 2006)

Well-planned common reading programs can be used to signal the importance of reading in college and the value of diverse viewpoints during discussion groups. (Laufgraben, 2006) The books can also play a key role in helping to establish academic expectations before arrival. (Andersen, 2018)

Lewin (2007) found that the books chosen for common reading programs tended to be relatively short, engaging, multicultural, dealt with some aspect of diversity, and were bestsellers. The ability of the author to visit campus was also part of the decision criteria. Grenier (2007) also notes that part of the book selection process includes finding a title that is compatible with the university's mission; and one that is sensitive to the reputation of the university.

To get a sense of the books chosen, Grenier (2007) conducted a survey of approximately 80 reading programs. He then classified the chosen books into six different categories:

- Political Issues (Macro geopolitics, policies economy, war, environment, inequality) 26.0%
- Rationalization (Micro self-ID, introspection, relationships) 21%
- Human development (Macro public health, immigration, education, lifestyles) 17%
- Oppression (Mixed discrimination, ghettoization, human rights, slavery) 14%
- Adjustment (Micro coping, survival, self-development, coming-of-age) 14%
- Action (Micro heroism, leadership, philanthropy) 7%
- Miscellaneous (unclassified) 1%

Implementing a common reading program

There is a great deal of work in implementing a common reading program. Among the key steps to be taken: book selection; publicizing and creating partnerships with students, faculty, and staff; planning events and activities (discussion groups, author presentation, dining options); creating a budget, and an assessment of the program. (Andersen, 2018, McIntyre, 2012, University of Iowa, 2008, and Kelly and Bonilla, 2007).

It is apparent that many colleges have a common reading program, but there has not been much written about such programs that are specific to business schools. The next section takes a detailed look at one business school's common book program.

THE VILLANOVA SCHOOL OF BUSINESS (VSB) READ TO LEAD PROGRAM

Despite the popularity of university common reading programs, not much has been written about similar programs specific to business schools. This paper looks at one business school's common reading program, including its implementation and integration.

The Villanova School of Business (VSB) began its Read to Lead program in the Summer of 2008. The initiative for such a program grew out of a successful One Book program at the University level which began in 2006. Here is an excerpt from the University website which describes the purpose of One Book program:

The journey through the books selected in previous years have done more than just taken the Villanova community to different parts of the world. These works have allowed us to explore our humanity, our ability to empathize with the sufferings of others, and our willingness to engage in hard truths about ourselves. The goal of One Book Villanova has always been to draw the Villanova community even more tightly together as we journey through the continuous adventure of a book. (Villanova University, 2022)

Given the success of the One Book program, a decision was made to create a similar program for new students (first-year and transfers) in the School of Business. Here is a brief description of the Villanova School of Business Read to Lead Program:

The VSB Read to Lead Program, sponsored by EY, is an integral part of the undergraduate curriculum and connects students around a highly relevant business theme before freshman year. The book offers students a real-world context for learning and provides a launching point for integrative discussions, projects, and analyses of topics in the Business Dynamics freshman core business course. It also provides students with new opportunities for discussions with high-level corporate leaders. (Villanova School of Business, 2022)

Implementing VSB's Read to Lead program
Once the decision was made to create a common reading program for the School of Business, a committee was formed to plan for and implement such a program. The committee consists of the Undergraduate Dean of VSB as well as the team of faculty who teach the first-year business course, Business Dynamics.

The committee members are asked to nominate a book for the program, and then copies of the nominated books are ordered for the members. For the first year of the program, this process began approximately one year in advance of the launch of the program.

The criteria for the books nominated include its relevance to the Business Dynamics (BD) course, the ease with which the book can be integrated into the BD course, the ability of the book to engage and excite the reader, and the likelihood of having the author visit campus to speak to the students. Appendix A lists the books that have been used each year since the start of the program, as well as the speakers who were able to give a presentation to the students based on the contents of the book.

For the first few years of the program, the books were mailed to the incoming first-year (and other students taking the Business Dynamics course, such as transfer students) along with a set of questions related to the book. The questions are both fact-based, to ensure the book was read, as well as more reflective type questions. Since COVID, students are sent a letter which welcomes them to VSB and notes what the Read to Lead selection is for their class. The students are now required to purchase the book on their own, and the Bursar will credit their account for $15 to cover the cost of the book. The questions are then sent to the students in a follow-up email.

Students are required to prepare written responses to the questions, and the assignment is due approximately three weeks after the start of the Fall semester. Appendix B provides an example of the types of questions which students are asked, based on the two most recent Read to Lead selections.

Integrating the Read to Lead book into the Intro to Business course
In addition to the assigned questions, the Read to Lead choice is integrated throughout the Business Dynamics course. For example, as part of the discussion of Accounting and Finance, a set of questions based on the 10-K and the included financial statements of the firm featured in the book are assigned to the students. In those years when the book chosen featured a privately held company, the 10-K of a company in the same industry was used. For the marketing module, the products and services of the featured firm were highlighted. For discussions of ethics and social responsibility, the featured company's website often provided a wealth of information about the company's approach to such issues. There are many other opportunities to incorporate the featured company into class discussions throughout the semester.

In addition to having an outside speaker with ties to the content of the book, there are other activities that can relate to the Read to Lead selection. For example, the selection for the Summer of 2022, Trailblazer, tells the story of how one of its employee teams came up with the slogan "Awesome, Guaranteed" as a way to unite and motivate the team members. The plan is to recreate that slogan on a large chalkboard in the business school, and invite the students to sign their name to it.

One other possibility that is under discussion for this year's Read to Lead book choice is to model Salesforce's commitment to service and charity. The faculty are looking into local charities that each section of the course (there are approximately 20 sections) would research, and then have the students voluntarily contribute their time or money to the organization. Such an initiative would be consistent with the mission of the University and its commitment to service.

Benefits of VSB's Read to Lead program
There are many benefits to VSB's Read to Lead program, as outlined below:

- It creates a shared learning experience for students new to the business school
- It provides a way to bring to life many of the concepts taught in the intro to business course
- Given the criteria for choosing a book, it creates a way to get students excited about the world of business
- It provides a way to tap into the students' eagerness to begin their studies by assigning the book during the summer before they arrive on campus
- Simply put, it gets students reading, and possibly helps them to create a lifelong habit of becoming a reader
- It offers the possibility of having a high-level executive visit the campus and give a presentation to the students and meet with the faculty
- A group of students had such a positive experience with the Read to Lead program that they formed a VSB Student Book Club. The students decide which book to read that year, meet to discuss it, and then attempt to get the author to visit campus. One such speaker was Stephen Schwarzman, CEO of the Blackstone Group.

CONCLUSION

Many colleges have successfully adopted common reading programs. This paper looked at how a business school created and integrated its own common reading program, known as Read to Lead, into its first year Intro to Business course. The paper also highlights the many benefits of such a program. A listing of the books used since the start of the program in 2008, as well as the set of questions that accompanied the two most recent book selections are also included. The hope is that other schools will consider such a program, and that VSB's Read to Lead program will serve as a model for those schools to follow.

Finally, it is important to note that the costs of the Read to Lead program are funded through the generosity of EY, a global financial services firm. This funding includes both the cost of the books as well as other program costs, such as travel costs for the speaker.

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Appendix A: List of Read to Lead Books

Year	Book Title and Author	Speaker
2008	*Pour Your Heart Into It: How Starbucks Built a Company One Cup at a Time* by Howard Schultz	Kathie Lindemann: SVP and GM at Starbucks
2009	*Pour Your Heart Into It: How Starbucks Built a Company One Cup at a Time* by Howard Schultz	Wanda Herndon: SVP, Global Communications at Starbucks
2010	*Googled: The End of the World As We Know It* by Ken Auletta	Kristin Shevis: Director of Northeast Enterprise at Google
2011	*Delivering Happiness: A Path to Profits, Passion, and Purpose* by Tony Hsieh	Jamie Naughton: Head of Employee Engagement and Speaker of the House at Zappos (last minute cancellation)
2012	*Start Something That Matters* by Blake Mycoskie	
2013	*Conscious Capitalism: Liberating the Heroic Spirit of Business* by John Mackey, Raj Sisodia, and Bill George	Ken Letherer: Manager at local Whole Foods store
2014	*The Wawa Way: How a Funny Name and Six Core Values Revolutionized Convenience* by Bob Adelman, Dana Hickox, and Howard Stoeckel	Chris Gheysens: CEO at Wawa
2015	*Winners Dream: A Journey from Corner Store to Corner Office* by Bill McDermott and Joanne Gordon	Bill McDermott: CEO at SAP (last-minute cancellation)
2016	*Do the KIND Thing: Think Boundlessly, Work Purposefully, Live Passionately* by Daniel Lubetzky	John Leahy: President at KIND
2017	*How Google Works* by Eric Schmidt and Jonathan Rosenberg	John Doerr: partner at Kleiner Perkins; Board of Directors at Google
2018	*The Upstarts: How Uber, Airbnb, and the Killer Companies of the New Silicon Valley Are Changing the World* by Brad Stone	Brad Stone: author of The Upstarts
2019	*Leading Matters: Lessons from My Journey* by John Hennessy	John Hennessy: Chairman of the Board at Google, President at Stanford
2020	*Shoe Dog: A Memoir by the Creator of Nike* by Phil Knight	COVID restrictions
2021	*No Rules Rules: Netflix and the Culture of Reinvention* by Reed Hastings and Erin Meyer	COVID restictions
2022	*Trailblazer: The Power of Business as the Greatest Platform for Change* by Marc Benioff and Monica Langley	

Appendix B: Assigned Questions from Recent Read to Lead Selections

2022: *Trailblazer: The Power of Business as the Greatest Platform for Change* by Marc Benioff and Monica Langley

1. What are Benioff's views on the role of a CEO as it relates to responsibility on social issues? What do you see as the possible positives and negatives of Benioff's views towards social responsibility? How would this impact your decision to work for that company?
2. Name one person Benioff considers a mentor and what impact they had on his professional outlook. Choose one person (e.g., relative, friend, coach, teacher) who you consider a mentor and explain the impact they have had in your life.
3. "When bright employees see misalignment with their values, they view it as a personal betrayal–and then they walk." Would you find it hard to leave a high-paying, high-profile job when faced with such a dilemma?
4. Benioff notes that Salesforce's success is best explained by the moments when trust prevailed over the motivation to maximize revenue or profit. Share one example from the book where he chose trust over profit.
5. What are the four key values of Salesforce? Which of these values would be the most important to you, and why?
6. Equality is one of Salesforce's key values and Villanova/VSB has embraced a DEI mindset as well. Here is a brief description of DEI (from https://dei.extension.org/)

   Diversity is the presence of differences that may include race, gender, religion, sexual orientation, ethnicity, nationality, socioeconomic status, language, (dis)ability, age, religious commitment, or political perspective. Populations that have been-and remain- underrepresented among practitioners in the field and marginalized in the broader society.

   Equity is promoting justice, impartiality, and fairness within the procedures, processes, and distribution of resources by institutions or systems. Tackling equity issues requires an understanding of the root causes of outcome disparities within our society.

   Inclusion is an outcome to ensure those that are diverse actually feel and/or are welcomed. Inclusion outcomes are met when you, your institution, and your program are truly inviting to all. Inclusion reflects the degree to which diverse individuals are able to participate fully in the decision-making processes and development opportunities within an organization or group.

   Would you do anything if you felt that the company you chose to work for was not supportive of DEI? If you chose to do something (or were giving advice to someone who wanted to do something), what can an individual do to influence their organization?

7. Benioff believes in "Ohana" as part of the Salesforce culture. What does this mean and why does he see it as a strength?
8. What is the "V2MOM"? What would be your V2MOM well-being goal for your first year at Villanova?
9. After reading Trailblazer, would you want to work for Salesforce? Why or why not?

1. The book introduces the reader to the unique culture of Netflix, one that focuses on Freedom and Responsibility. In your own words, describe what you think is meant by corporate culture and what role it plays in a company's success.

2. The authors reference Steve Jobs' graduation speech at Stanford and his mention of connecting the dots, and then uses the metaphor of dots throughout the book. What are some dots you can connect from the past 18 years of your life that help to explain how you arrived at a top-notch business school? (By the way, if you have never seen Jobs' speech, here is the link: https://www.youtube.com/watch?v=Hd_ptbiPoXM Fun fact: the guy who introduced Jobs, the President of Stanford University, John Hennessy, is a graduate of Villanova University!)

3. Describe in your own words what you think is meant by "talent density" and why you think the authors believe it is the most critical part of the success that Netflix has had. Do you agree or disagree with this idea? Why?

4. Hastings emphasizes giving "candid feedback with positive intent". Many managers do not do this well, even at annual reviews. Why do you think this is so? Do you think it is harder to receive candid feedback or to give someone else candid feedback? Share a personal example of when you have experienced either. Were you able to achieve a positive outcome in this example?

5. As you will learn in Business Dynamics, the notion of control is considered one of the key functions of management (along with planning, leading, and organizing). Yet Hastings seems almost obsessed with getting rid of as many traditional controls at Netflix as he can. Why does he seem so against overt controls? Also, describe in your own words what you think is meant by the phrase, "lead with context, not control"?

6. Hastings does not believe in giving bonuses to drive additional performance, instead focusing on very compelling base salaries. What are the pluses and minuses to this approach? Are there any functions in the company (Accounting, Marketing, Sales, Operations, IT) where you believe paying bonuses would be beneficial?

7. Transparency has been a buzzword in the world of business for many years, and many companies just pay lip service to it. What do you think is meant by transparency, and why is it such a big part of the Netflix culture? Are there any examples from the "test" where you felt he should not be as transparent? (side note – in your second semester you will take a course in Financial Accounting where you will learn to read an Income Statement, which is referred to as a P&L in the Netflix book. You will be able to hit the ground running if you join Netflix!)

8. What do you think is the most important step in the Netflix Innovation Cycle? Why? Would you find it difficult to "sunshine your failures"? Why or why not?

9. Chapter 7 poses several questions to Hastings about the culture of high-performance at Netflix. If you were able to ask Hastings one question about Netflix's culture, what would it be? Do you agree that all the concepts noted in the book need to be implemented to really make an impact, and not just some of them?

10. What is your opinion on Netflix's use of a "live 360"? Would you look forward to such a review?

11. Chapter 10 focuses on the globalization of Netflix' culture. They use culture maps to adapt their approach in certain countries. What are some of the risks in using one "map" to characterize an entire nation of people?

12. On the Netflix job website (https://jobs.netflix.com/culture), there is a full page devoted to describing and discussing Netflix's culture, most of which you read about in the book. The culture page closes with the following quote from Antoine de Saint-Exupéry, the author of The Little Prince (the quote is also found in Chapter 9):
    If you want to build a ship, don't drum up the people to gather wood, divide the work, and give orders. Instead, teach them to yearn for the vast and endless sea.
    After having read this book, does Netflix seem like a place you would want to work? Why or why not?

Manuscript Guidelines, Submission and Review Process

TOPIC AREAS (BUT NOT LIMITED TO THESE):
- Course design – current courses, new courses, new trends in course topics
- Course management – successful policies for attendance, homework, academic honesty …
- Class material
  - Description and use of new cases or material
  - Lecture notes, particularly new and emerging topics not covered effectively in textbooks
  - Innovative class activities and action-learning – games, active learning, problem based
- Major or emphasis area program design that is new or innovative.
- Assessment – all aspects including AACSB and university level assessment strategies and programs
- Integration of programs or courses with other academic disciplines
- Internship programs
- Business partnerships
- Successful student job placement strategies
- Any topic that relates to higher education business education.

SUBMISSION AND REVIEW PROCESS:

Copyright

- Manuscripts submitted for publication should be original contributions and should not be under consideration with another journal.
- Authors submitting a manuscript for publication warrant that the work is not an infringement of any existing copyright, infringement of proprietary right, invasion of privacy, or libel and will indemnify, defend, and hold Elm Street Press harmless from any damages, expenses, and costs against any breach of such warranty.

Prepare your manuscript

- See the Style Guideline page for specific instructions.
- Articles must make a contribution to business education innovation.
- Manuscripts should be limited to 8 to 10 pages or less, although longer will be accepted if warranted.
- Articles can be either regular research papers, or shorter notes that succinctly describe innovative classroom teaching methods or activities.
- Manuscripts should be completely finished documents ready for publication if accepted.
- Manuscripts must be in standard acceptable English grammatical construction.
- Manuscripts should be in MS Office Word format. Word 2007 files are acceptable, as are earlier versions of Word. If you are using a new version of Word after Word 2007, save in Word 2007 format.

Submit your manuscript

- Manuscripts may not have been published previously or be under review with another journal.
- Submit the manuscript attached to an email to **submit@beijournal.com**
- We will respond that we have received the manuscript.
- Article submissions can be made at any time.
- Submission deadlines: September 15 for December issue, March 15 for June issue.

Manuscript review

- The editor and reviewers will review your submission to determine if 1) the content makes a contribution to innovative business education, 2) is of the proper page length, 3) is written in proper grammatical English, and 4) is formatted ready for publication.
- Submissions not meeting any of these standards will be returned. You are invited to make revisions and resubmit.
- If the submission meets the standards, the manuscript will be sent to two reviewers who will read, evaluate and comment on your submission.
- The editor will evaluate the reviews and make the final decision. There are 3 possible outcomes:
    - Accept as is.
    - Accept with minor revisions.
    - Not accepted.
- Reviews will be returned promptly. Our commitment is to have a decision to you in less than two months.
- If your paper is not accepted, the evaluation may contain comments from reviewers. You are invited to rewrite and submit again.

If your paper is accepted

- Minor revision suggestions will be transmitted back to you.
- Revise and send back as quickly as possible to meet printer deadlines.
- Upon final acceptance, we will bill you publication fees.   See www.beijournal.com for latest per page fees. Sole author fees are discounted.
- The fees include all costs of mailing a copy of the issue to each author via standard postal ground.
- Delivery to locations outside the continental US will cost an additional $10 per author for 5 day delivery.
- Faster delivery methods are available for US and international delivery. Contact the editor for a specific pricing.
- All publication fees should be remitted within 10 business days of acceptance, if possible.
- If you decide not to publish your paper with BEI Journal after submitting payment, we will refund publication fees less $200 to cover costs of review and processing.
- Cancellation cannot occur after the paper has been formatted into the final printer's file.

Manuscript Style Guide and Example

An example is provided following these instructions.

This style guide represents style guidelines in effect for future issues, but always check for updates online.

Authors are responsible for checking for correct grammar, construction and spelling. Authors are also responsible for formatting pictures, tables, and figures such that a pdf black and white file sent to the publisher will reproduce in a readable manner.

General Setup:
- All fonts other than exceptions noted below: Times New Roman. 10 point for text. Other sizes as noted below
- Margins: 1 inch on all sides of 8½x11 inch paper size.
- No headers or footers.
- Absolutely no footnotes or endnotes via footnote or endnote formatting. For footnotes or endnotes, place a number of the footnote in the proper location as a superscript. Then at the end of the paper or bottom of the page, add the footnote as text with a superscript number to correspond to that footnote.
- Page numbering bottom centered.
- No section breaks in the paper.
- No color, including url's. Format to black. No color in tables or figures. Use shading if necessary.
- All pages must be portrait orientation. Tables and figures in landscape orientations should be reformatted into portrait orientation.
- All paragraphs should be justified left and right, single spaced, in 10 point Times font, no indent on first line, l line between each heading and paragraph.
- One line between each paragraph.

Titles, Authors, and Headings:
- # Title centered 14 point bold. One line between title and author's name.
- ## Authors: centered, 12 point. Name, affiliation, state, country.
- One line space to **ABSTRACT** (title 10 point, bold, all capitalized, aligned left; text of abstract 10 point, no bold)
- After **ABSTRACT**, one line space, then **Keywords**. Followed by one line space to first major heading.
- **HEADINGS, MAJOR**, 10 point, bold, all capitalized, aligned left.
  The specific headlines will be based on the content of the paper, but major sections should at a minimum include an abstract, keywords, introduction, conclusion, and references.
- **Sub-headings**: 10 point, bold, first letter capitalized, no line to following paragraph. Align left.
- *Third level headings: Italic*, 10 point, first letter capitalized, no line to following paragraph. Align left.
- **Keywords:** heading: 10 point, bold, first letter capitalized, no line to following paragraph. Align left.
  Your list of keywords in 10 point, no bold.

Tables, Figures and Graphs:
- All fonts 10 point.
- Numbered consecutively within each category. Table 1, Figure 1 etc.
- Title: 10 point, bold, left justify title, one space, then the table, figure, etc.
- Example: **Table 1: Statistical Analysis**

References:
- APA format when citing in the text. For example (Smith, 2009).
- References section: 8 point font, first line left margin, continuation lines 0.25 inch indent. Justify left and right. No line spacing between references. List alphabetically by first author.
- Specific references: Last name, First initial, middle initial (and additional authors same style) (year of publication in parentheses). Title of article. *Journal or source in italics.* Volume and issue, page number range.
- Example: Clon, E. and Johanson, E. (2006). Sloppy Writing and Performance in Principles of Economics. *Educational Economics.* V. 14, No. 2, pp 211-233.
- For books: last name, first initial, middle initial (and additional authors same style) (year of publication in parentheses). *Title of book in italics.* Publisher information.
- Example: Houghton, P.M, and Houghton, T.J. (2009). *APA: The Easy Way!* Flint, MI: Baker College.

Example (note that this example represents a change from previous style guides)
Evidence to Support Sloppy Writing Leads to Sloppy Thinking

Peter J. Billington, Colorado State University - Pueblo, Colorado, USA (12 point)
Terri Dactil, High Plains University, Alberta, Canada

ABSTRACT (10 point, bold, all capitalized, left justified)

(text: 10 point Times font, no indent, justified, single space, 150 words maximum for the abstract)
The classic phrase "sloppy writing leads to sloppy thinking" has been used by many to make writers develop structured and clear writing. However, although many people do believe this phrase, no one has yet been able to prove that, in fact, sloppy writing leads to sloppy thinking. In this paper, we study the causal relationship between sloppy writing and sloppy thinking.

Keywords: sloppy writing**,** sloppy thinking **(10 point, bold title, first letter capitalized, left justified).**

INTRODUCTION (10 point, bold, all capitalized, left justified).

The classic phrase "sloppy writing leads to sloppy thinking" has been used by many to make writers develop structured and clear writing. However, since many people do believe this phrase, no one has yet been able to prove that in fact, sloppy writing leads to sloppy thinking. Is it possible that sloppy writing is done, even with good thinking. Or perhaps excellent writing is developed, even with sloppy thinking.

In this paper, we study the writing of 200 students that attempts to test the theory that sloppy writing leads to sloppy thinking.

PREVIOUS RESEARCH

The original phrase came into wide use around 2005 (Clon, 2006), who observed sloppy writing in economics classes. Sloppy writing was observed in other economics classes (Druden and Ellias, 2003).

RESEARCH DESIGN

Two hundred students in two business statistics sections during one semester were given assignments to write reports on statistical sampling results. The papers were graded on a "sloppiness" factor using…

Data Collection (Sub-heading, bold but not all caps, 10 point, aligned left, bold, no line after to paragraph)
The two hundred students were asked to write 2 short papers during the semester…

Data Analysis(Sub-heading, bold but not all caps, 10 point, aligned left, bold, no line after to paragraph)
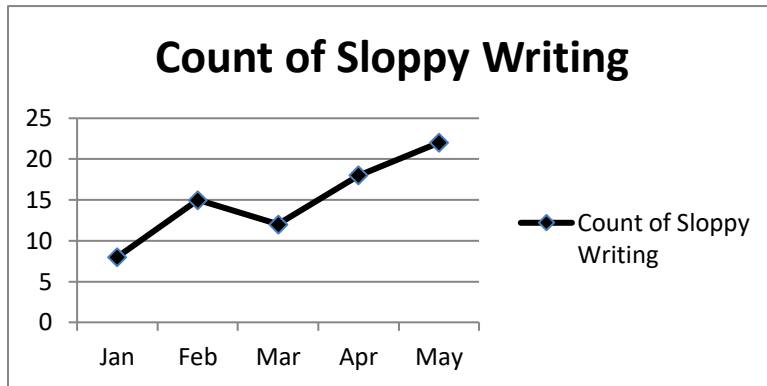The two hundred students were asked to write 2 short papers during the semester…

DISCUSSION

The resulting statistical analysis shows a significant correlation between sloppy writing and sloppy thinking. As noted below in Figure 1, the amount of sloppy writing increases over the course of the spring semester.

Figure 1: Sloppy Writing During the Semester

The count results were compiled and shown in Table 1 below.

Table 1: Counts of Good and Sloppy Writing and Thinking (bold, 1 line after to table, left justify)

	Good Thinking	Sloppy Thinking
Good Writing	5	22
Sloppy Writing	21	36

*-Indicates significance at the 5% level)

As Table 1 shows conclusively, there is not much good writing nor good thinking going on.

CONCLUSIONS

The statistical analysis shows that there is a strong relation between sloppy writing and sloppy thinking, however, it is not clear which causes the other…

Future research will try to determine causality.

REFERENCES (title10 point, all caps, bold, align left, one line to first reference)
        (1line spacing) (All references 8 point, indent second line 0.25 inch, justify left and right)

Clon, E. (2006). Sloppy Writing and Performance in Principles of Economics. *Educational Economics*. V. 14, No. 2, pp 211-233.
Devad, S. and Flotz, J. Evaluation of Factors Influencing Student Class Writing and Performance. *American Journal of Farming Economics*. V. 78, Issue 3, pp 499-502.
Druden, G. and Ellias, L. (1995). *Principles of Economics*. New York: Irwin.

        (short bio section optional, can run longer than these examples; removed before sent to reviewers)

Peter J. Billington, Ph.D., is a professor of operations management at Colorado State University – Pueblo. His research interests include lean six sigma and innovative education.

Terri Dactil, Ph.D., is a professor of business communication in the College of Business at High Plains University, Alberta, Canada. His research interests include instructional methods to improve student communication skills.

Endnote: (do not use word footnote or endnote formatting to accomplish this; see comments above)