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RELATIONSHIPS BETWEEN COLLEGE COSTS AND COLLEGE FUNDING: EVIDENCE FROM THE UNITED STATES

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ABSTRACT

In the last few decades, college tuition costs have escalated to what some have described as astronomical levels. This has led to a heavier reliance by college students on alternative sources beyond family financing. Such sources have included grants, scholarships, private loans, federal loans and alas credit cards. This study examines the impact of this increased and high tuition costs on the source of funding options students pursue and apply to their college education. Five factors indicated a strong relationship for the students who took loans – namely students who had been in school longer were less likely to take loans, students who had entered the college from another four-year college were also more likely to take loans, students from families with higher incomes were also less likely to take loans and students who were later in their family to go to college were also less likely to take a loan

JEL: M1, I2, H5

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INTRODUCTION

In the last few decades, college tuition costs have escalated to what some have described as astronomical levels. This has led to a heavier reliance by college students on alternative sources, beyond family financing. Such sources have included grants, scholarships, private loans, federal loans and alas credit cards. This study examines the impact of this increased and high tuition costs on the source of funding options students pursue and apply to their college education.

Statistical data from the U.S. Department of Education and the National Center for Education Statistics, provide details on recent college expenses. They state that for 2015–16, the overall year's total expenses for undergraduate students for their room, board, tuition and additional expenses were on average said to be $16,757 at public institutions, $43,065 at private nonprofit institutions, and $23,776 at private for-profit institutions (U.S. Department of Education, National Center for Education Statistics, 2018). The said statistics also noted that in the ten years from 2005–06 and 2015–16, the costs for undergraduate room, board, tuition and additional expenses increased 34 percent, and prices during the same period at private nonprofit institutions increased 26 percent, after taking into consideration inflation (U.S. Department of Education, National Center for Education Statistics, 2018). The current literature on the topic of college funding for students have looked at the availability of college funding on the type of college – public or private – that students choose to attend (Lillis, 2008; Johnson et al, 2016). The literature has also looked at what effect financial parental investments have on student GPA and degree completion Hamilton (2013). While another study has detailed that parents have delayed their retirement,

pushing it back, so they can continue to financially support children they have in college (Handwerker, 2011). While these studies make critical contribution to the literature, less is known about the role that varying and highly diverse factors play in college students' borrowing funds for college.

The purpose of this study was to examine patterns of funding for college students' tertiary education. In essence, how are college students funding their college education? Is this primarily through loans, scholarships, working, parental or family assistance? The sample will consist of undergraduate students recruited from Siena College. Discussion from the results will focus on implications for college students as they seek to navigate the changing landscape for funding their college education. The importance of new information and studies on college affordability and factors impacting students' college loan decisions is particularly significant in today's environment – where college costs are seen as exorbitant and defaulting on college loans by graduating and non-graduating students is at a critical level.

The paper begins with a look at the relevant literature, followed by the research design and sample and the descriptive, correlation and regression results. The paper ends with a conclusion and discussion section that explains the significance regarding the results to the existing literature and provides a proposal on future possible studies.

LITERATURE REVIEW AND BACKGROUND

Two detailed studies to have looked at college students and their college choices looked specifically at the impact of high-tuition, high-loan approach as it relates to the role of socioeconomic status on educational choice within varying situated contexts (Lillis, 2008). The author used a questionnaire that assessed college-choice behavior across various socioeconomic groups within and between high-cost and low-cost private postsecondary institutions. The study concluded that lower income students are more likely to choose more affordable or lower-tuition college choices, but also more likely to graduate, compared to their more affluent counterparts.

In a similar vein, a study by Johnson et al (2016) looked to understand the decision making process college students maneuver when borrowing money to finance their education. The authors concluded the following critical points: (a) students relied heavily on advice from parents, guidance counselors, and friends ;(b) attending college was not possible without student loans; and (c) students knew very little about the loans they would be responsible for repaying (Johnson et al, 2016). Breier (2010) in a study in South Africa noted that students from higher income levels were less likely to borrow funds for their higher education and when they did borrow, they requested smaller amounts and repaid it at a faster rate than their counterparts from lower income households.

Three key studies have looked at the impact of rising tuition costs on family income (Hamilton, 2013; Cheng et al, 2012; Handwerker, 2011). The first study employed tertiary level data from a national sample to assess how parents' financial investment in their children's education impact the latter's GPA and degree completion, Hamilton (2013) showed that parental financial investments increase college attendance. In addition, the author found that if parents assist their children with financial help, it did result in a decrease in these students' GPA, but that the said students were more likely to graduate (Hamilton, 2013). Thus the author found that students that were helped by their parents financially did ultimately graduate but were less motivated to do well – presumably because their continued funding did not necessarily depend on applying for scholarships and grants that might require high GPAs (Hamilton, 2013). In contrast, Cheng et al's (2012) study of 240 university students (62 men, 178 women) concluded that the students in that study actually maintained a high GPA when they received parents' financial support. In fact, the authors noted that parents that helped their children financially, were also more likely to also provide social support and that this social support played a positive role in improving the students' GPAs (Cheng et al, 2012). This financial and social support was particular

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acute for female students in the study, who expressed that the dual support (financial and social) were very instrumental in them maintaining high GPAs through successive semesters (Cheng et al, 2012).

In a third study looking at financial college support and parents' income support, the author showed that after controlling for certain variables – that is - the total number of children who attended college and the total number of children who had their parents pay for their college education – several predictable findings were concluded. First, older parents who paid for their children's college education were more likely than their counterparts to continue working, that is not be retired (Handwerker, 2011). Broken down by gender, the author found that fathers were more likely to be working at 10.5% points than mothers at 6.9% points (Handwerker, 2011). These older parents from the same study were also likely to be drawing on their social security benefits (Handwerker, 2011).

Some of the most robust areas of research in this area has looked at college students' college funding and government funding, including state and federal sources. First, Martin (2002) discussed the rising costs of college tuition, attributing it to less public subsidies and the increased costs of professors as they pursue scholarship opportunities (Martin, 2002). Hemelt and Marcotte (2016) used student-level data on twelfth graders in 1992 and 2004 and found a decrease in the probability of high school students attending the in-state public universities, when there had been substantial increases in said tuitions. It could be inferred that such students dismissed the idea of in-state public institutions being less expensive and searched for cheaper alternative tertiary education options Hemelt and Marcotte (2016). These cheaper alternatives resulted in these students pursuing their college level education at public two year colleges – presumably to reduce the overall four-year financial commitment to college Hemelt and Marcotte (2016).

Overall the two authors found that large tuition increases at these public four-year colleges had reduced the likelihood that the high school graduates in those states would choose to pursue these public institutions and instead to look for cheaper alternatives such as less prestigious in-state public colleges, out-of-state public institutions, or private universities (Hemelt and Marcotte, 2016). These effects were most pronounced among students from families of low socioeconomic status, and non-elite students who performed below the 90th percentile on twelfth-grade math tests (Hemelt and Marcotte, 2016). Similar results were found from Chen et al (2011) whose study concluded that state funding of need-based aid was positively associated with college students' chances of persistence.

A study by Perna et al's (2008) drew on data from descriptive studies of 15 high schools and highlighted constraints in the availability of college counseling. The authors concluded that in the context of limited fiscal and other resources, as well as changes in federal and state financial aid policies and positive changes in district policies, all will help to ensure that high school students receive the appropriate help regarding college counseling and specifically college counseling related to financial aid (Perna et al, 2008). In a similar vein, Mclendon et al (2014) using a sample of undergraduate college students concluded that states who invested heavily in financial aid counselling will see students who are more equipped to make the best decisions regarding sources of funding for their higher education. Henry and Smith (2017) who used a sample of community college students, also found that educational assistance financial aid programs led to improved knowledge overall and higher retention rates among said college students. The positive relationship between increased financial aid education as it relates to college finances and improved performance by the college students was reinforced in studies by Greenfield (2015), Kaufman et al (2008), Harrington et al (2016) and Shireman (2009).

In a few miscellaneous but important studies on college students and their higher education funding, mixed results were found. Bertolas' (2018) article focused on the National Collegiate Athletic Association (NCAA), which help the college student-athletes who compete in college sports through the athletic programs of many colleges and universities in the U.S. and Canada. The author concluded that athletes received adequate funding through their colleges and didn't need additional college funding (Bertolas,

2018). Gayles and Hu's (2009) study examined factors related to student athletes' engagement in education and found it to be purposeful. Gonzalez (2017) completed more than 40 years of research found a positive relationship between increases in the proportion of non-resident students enrolling in an institution and increases in the tuition prices this institution charges to these same students. Finally, Hountras and Brandt (1970) looked at the relation of student residence to academic achievement in five colleges of an upper Midwest university, concluding that those living on campus were likely to do better academically.

DATA AND METHODOLOGY

The sample for this study was derived from students at a primarily undergraduate college, located in upstate New York, in the suburb of Albany. The college was originally established as a male commuter school in 1937. It remained a single sex institution until 1969, when the first female students were admitted. By 2009, the female population at the institution had grown to 56%. The students who participated in this study included freshmen, sophomores, juniors and seniors. A total of 432 students ultimately completed the questionnaire, from the three Schools at the college, namely the School of Liberal Arts, the Schools of Business and the School of Science. The survey was completed by the students between April and June 2018. These 432 students represented a response rate of 62%.

Some students were sent an email soliciting their participation in an online questionnaire. Other students were read a script in class by their professor, again soliciting their participation in either a hard copy or an online questionnaire. The questionnaire was designed to assess the source of funding for the students' college education. In the questionnaire, participants were asked to respond with varying degrees of intensity in regards to the source of their college funding, as well as demographic data (such as age, gender, family income, sports involvement and living arrangement) to be used for a correlation assessment.

RESULTS AND DISCUSSIONS

The descriptive results begin with a look at the age of the students who participated in this study. In Table 1, the first panel shows the age range of all participants, the second panel shows the number of students in the study who are that age and the third panel shows the corresponding percentage of students that were a certain age. The majority of the students were in the 17-22 age group with the largest percent of the participants falling in this category. There were some outliers in the age group, with a few students in their late 20s, 30s and 40s.

Table 2 shows the gender of the students who participated in this study. The first panel shows the gender of all participants (including a category of Self-Identify), the second panel shows the number of students in the study who belong to each gender and the third panel shows the corresponding percentage of students that were in each gender category. In looking at the gender of the participants, most were male, with a percentage at 50.74 percent. The participants also consisted of 49 percent females. One student, 0.26 percent of the participants chose to self-identify (see Table 2). The Table also shows the School Division that students belong to at the college. As stated earlier, there are three divisions at the college, namely Arts, Business and Science. The first panel shows the School Divisions at the college, the second panel shows the number of students in each division and the third panel shows the corresponding percentage of students that were in each division. The results showed that School of Arts made up 28.22 % with 114 responses. 60.39% of participants came from the School of Business with 244 participants. The School of Science only made up 11.39% with 46 responses.

Table 1: Age of Participants

Age of Participants	Number of Students	Percentage (%)
17	2	0.49
18	63	15.59
19	95	23.51
20	83	20.54
21	84	20.79
22	59	14.60
23	4	0.009
24	3	0.007
25	3	0.007
26	2	0.005
28	1	0.002
31	1	0.002
37	1	0.002
39	1	0.002
46	1	0.002
Question not Answered	1	0.002
Total	**404**	**100%**

This Table provides results on the age of the participants in the study.

Table 2 also shows the description of the participants based on the year in school the participants belonged to. Panel A shows the years in college, namely Freshman, Sophomore, Junior and Senior. In looking at the year of study for the sample, the results showed that 28.22% of responses came from the Freshman class at 114 responses followed by Seniors which makes up 25.74% with 104 responses. Sophomores made up 25.00% with 101 responses. The junior class contributed 21.03% at 85 responses.

The Table also shows the type of school participants came from before attending the current college. In the Table, the first panel shows the type of school attended before coming to Siena College, the second panel shows the number of students in the study who attended a particular educational institution and the third panel shows the number of students in each category. In looking at the type of school participants came from before attending the current college, it should be noted that 81.68% of the students who participated in this survey came to Siena College from a high school. 9.40% of student participants came from a community college. 8.66% came from another four-year college. One student chose not respond or did not understand how to answer.

The Table also shows the type of high school participants attended before going to college. In the Table, the first panel shows the type of high school attended before going to college, the second panel shows the number of students in the study who attended a particular high school and the third panel shows the number of students in each category. In looking at the type of high school participants came from before attending the current college, it should be noted that 83.66% of participants came from a public high school. 13.61% of participants came from a private high school. 1.48% of participants came from a boarding school and 0.099% came from both a public and a private high school before Siena College, while 0.02% came from a charter school.

The Table also shows where the participants reside while attending college. In the Table, the first panel shows the type of residency, the second panel shows the number of students living in a particular type of residency and the third panel shows the number of students in each category. In looking at the place of residency of participants, it should be noted that 79.70% of participants live on campus, while 20.29% of the participants live off the campus. The Table also shows whether the students participating in this study paid rent or not. In the Table, the first panel asks whether students paid rent or not, the second panel shows the number of students in the study who answered yes or no to this question and the third panel shows the number of students in each category. In looking at whether or not a student paid rent, it should be noted, 93.81% of participants do not pay rent. 5.69% of participants do pay rent and 0.495% did not answer.

Table 2: Descriptive Results

Gender	Number of Participants	Percentage (%)
Female	198	49.00
Male	205	50.74
Self-Identify	1	0002
Total	**404**	**100**

School Division	Number of Participants	Percentages (%)
School of Art	114	28.22
School of Business	244	60.39
School of Science	46	11.38
Total	**404**	**100%**

Students' School Year	Number of Responses	Percentages (%)
Freshman	114	28.22
Junior	85	21.03
Senior	104	25.74
Sophomore	101	25.00
Total	**404**	**100%**

Students' Previous School Attendance	Number of Responses	Percentages (%)
Question was not Answered	1	0,02
Another Four Year College	35	8.66
Community College	38	9.40
High School	330	81.68
TOTAL	**404**	**100%**

Type of High School Attended	Number of Responses	Percentages (%)
Boarding	6	1.48
Charter	1	0.02
Private	55	13.61
Private and Public	4	0.099
Public	338	83.66
Total	**404**	**100%**

Students' Campus Residency Status	Number of Responses	Percentages (%)
Student does not Live on Campus	82	20.29
Student does Live on Campus	322	79.70
Total	**404**	**100%**

Students' Status of Paying Rent	Number of Responses	Percentages (%)
Question was not Answered	2	0.495
Student does not Pay Rent	379	93.81
Student does Pay Rent	23	5.69
Total	**404**	**100%**

This Table provides results on the gender, the school they majored in at the college, the school year the students were in and the type of school participants in the study attended prior to attending the current college. It also provides results on the type of high school attended, their current residency status while at the college and looked at whether or not they were paying rent in their current residency situation.

Table 3 shows the family income of the students who participated in this study. The first panel shows the range of family income of all participants, the second panel shows the number of students in the study who correspond to a particular income and the third panel shows the corresponding percentage of students that were in each category. In looking at the family income of the participants, Table 3 showed that only 283 participants choose to respond or knew their family income. Of the 283 responses, 16.25% claim a family income between $1 and $50,000, 34.62% of responses claim their family income is between $50,001 and $100,000, 16.61% of responses had a family income between $100,001 and $150,000, 19.79% claim a family income between $150,001 and $200, 000, 5.65% claim a family income between $200,001 and $250, 000 while 2.47% claim between $250,001 and $300,000. 1.41% claim a family income between $300,001 and $350, 000, 1.06% claim between $350,001 and $400,000, 0.07% claim a family income between $400,001 and $450, 000 and 1.06% claim between $450,001 and $500,000. And one person or 0.03% claimed a family income of between $850,001 and $900,000.

Table 3: Family Income Range

Students' Family Income Range	Frequency of Income Range	Percentages (%)
$0	0	0.00
$1 - $50,000	46	16.25
$50,001 - $100,000	98	34.62
$100,001 - $150,000	47	16.61
$150,001 - $200,000	56	19.79
$200,000 - $250,000	16	5.65
$250,001 - $300,000	7	2.47
$300,001 - $350,000	4	1.41
$350,001 - $400,000	3	1.06
$400,001 - $450,000	2	0.07
$450,001 - $500,000	3	1.06
$500,001 - $550,000	0	0.00
$550,001 - $600,000	0	0.00
$600,001 - $650,000	0	0.00
$650,001 - $700,000	0	0.00
$700,001 - $750,000	0	0.00
$750,001 - $800,000	0	0.00
$800,001 - $850,000	0	0.00
$850,001 - $900,000	1	0.03
Total	**283**	**100%**

This Table provides the family income range of the students who participated in this study.

Table 4 shows the number of siblings of each participant and the number of siblings that attended college. The first panel shows the number if siblings each participant has, the second panel shows the number of students in the study who correspond to a particular number of siblings and the third panel shows the corresponding percentage of students that were in each category. In looking at the number of siblings of the participants, 71.28% of responses say they have between one and two siblings. 14.85% of responses say they have between three and four siblings. 9.40% of responses have no siblings. 2.22% of responses say they have between five and six siblings. 1.23% of responses have between seven and eight responses.0.49% of responses say they have between nine and ten siblings and 0.25% say they have eleven and twelve siblings.The Table also details the number of students who had siblings in college. The fourth panel details the number of participants who indicated how many siblings they had in college and the fifth panel indicates the corresponding percentages. The Table shows that 60.64% of participants stated they had zero siblings in college, 37.12% of responses stated that they had between one and two siblings in college, 1.73% stated they had between three and four siblings in college. 0.25% of responses stated they had between five and six siblings in college.

Table 4: Number of Siblings for Each Participant and Number if Siblings in College

Students' Number of Siblings Range	Frequency of Sibling	Percentages (%)	Frequency of Sibling in College	Percentages
0	38	9.40	245	60.64
1 – 2	288	71.28	150	37.12
3 – 4	60	14.85	7	1.73
5 – 6	9	2.22	1	0.25
7 – 8	5	1.23	0	0.00
9 – 10	2	0.49	0	0.00
11 – 12	1	0.25	0	0.00
Total	**404**	**100%**	**404**	**100%**

This Table provides the results for the number of siblings each participant had in their family and the number of those siblings who are in college.

Table 5 shows the GPA of the students who participated in this study. The first panel shows the GPA range of all participants, the second panel shows the number of students in the study who correspond to a particular GPA range and the third panel shows the corresponding percentage of students that were in each category. In looking at the GPA, 386 of the participants answered or knew their GPA. 75.38% of

participants had a GPA between the range 3.01 and 4, 24.09% of participants had a GPA between 2.01 and 3 and 0.52% of participants had a GPA between 1.01 and 2.

Table 5: Participants' GPA Range

Students' GPA Range	Frequency of GPA Range	Percentages
0.00 – 1.00	0	0.00
1.01 – 2.00	2	0.52
2.01 – 3.00	93	24.09
3.01 – 4.00	291	75.38
Total	**404**	**100%**

This Table looks at the GPA of the students who participated in this study.

Table 6 shows the participants' type of residence and the students' status of being a first generation college student. In the first section, the first panel shows the state of residency or if the participant was from a country outside of the United States – the latter was included since not all students had their permanent residence in the United States, the second panel shows the number of students in the study who correspond to a particular state and the third panel shows the corresponding percentage of students that were in each category. In looking at the state of residency of the participants, 75.99% of participants are from New York State. 5.19% of participants are from Connecticut. 4.95% of participants are from Massachusetts. 3.21% of participants are from outside the United States., 2.72% of the participants from New Jersey and 1.48% of the participants are from Pennsylvania.

Table 6: Participants' State of Residence

Students' State of Residence	Number of Responses	Percentages (%)
The Student is not From the United States	13	3.21
Question was not Answered	2	0.49
California	4	0.99
Connecticut	21	5.19
District of Columbia	2	0.49
Florida	1	0.25
Georgia	1	0.25
Illinois	1	0.25
Massachusetts	20	4.95
Maryland	1	0.25
Montana	1	0.25
New Hampshire	4	0.99
New Jersey	11	2.72
New York	307	75.99
Ohio	3	0.74
Pennsylvania	6	1.48
Rhode Island	1	0.25
Texas	1	0.25
Vermont	4	0.99
Total	**404**	**100%**
Students' Type of Residential Area	**Number of Responses**	**Percentages (%)**
Question was not Answered	3	0.74
Rural	141	34.90
Suburb	206	50.99
Urban	54	13.36
Total	**404**	**100%**
Students' Status of Being a First Generation College Student	**Number of Responses**	**Percentages (%)**
Question was not Answered	3	0.74
The Student is not a First Generation College Student	324	80.19
The Student is a First Generation College Student	77	19.05
Total	**404**	**100%**

This Table looks at the state the students were from, the type of residential area the students were from, as well as whether the student was a first generation student to attend college in their family.

Table 6 also shows the type of residential area the participants are from. The first panel shows the type of residential area the participants are from, namely rural, suburban and urban, the second panel shows the number of students in the study who belong to each residential area and the third panel shows the corresponding percentage of students that were in each category. In looking at the residential type, 50.99% of the participants are from suburban areas. 34.90% of the participants are from rural regions. 13.36% of participants came from an urban region. Three people did not know how to or choose not to answer this question.

Table 6 also shows whether the students in the study are first generation students from their family to attend college or not. The first panel has categories that ask whether or not the participant was a first generation from their family to attend college, the second panel shows the number of students in the study who responded whether or not they were a first generation to attend college or not and the third panel shows the corresponding percentage of students that were in each category. In looking at the Table, 80.19% of the participants are not first generation students. 19.05% of participants are first generation college students. Three students either choose not to answer or didn't understand the question.

Table 7: Birth Order of Participants and Order of Family to Attend College

Students' Birth Order in Their Family	Number of Responses	Percentages (%)	Students' Order in Family to Attend College	Percentages (%)
Question was not Answered	3	0.74	7	1.73
The Student is the First Child in the Family	180	44.55	194	48.01
The Student is the Second Child in the Family	129	31.93	122	30.19
The Student is the Third Child in the Family	63	15.59	54	13.36
The Student is the Fourth Child in the Family	16	3.86	18	4.45
The Student is the Fifth Child in the Family	4	0.99	2	0.49
The Student is the Sixth Child in the Family	4	0.99	3	0.74
The Student is the Seventh Child in the Family	2	0.49	1	0.25
The Student is the Eighth Child in the Family	3	0.74	1	0.25
The Student is the Ninth Child in the Family			1	0.25
The Student is the Tenth Child in the Family			1	0.25
Total	**404**	**100%**	**404**	**100%**

This Table provides results on the birth order in their family of the students who participated in thus study and the order that the students went to college.

Table 7 shows the birth order of participants and order of family to attend college. The first panel shows the participants' birth order in their family, the second panel shows the number of students in the study who belong to each category and the third panel shows the corresponding percentage of students that were in each category. In looking at the Table 44.55% of participants are the first child in their family. 31.93% of participants are the second kids in their families, 15.59% of participants are the third child of their family, 3.86% of participants are the fourth child in their family, 0.99% of participants are the fifth or sixth child and 0.74% of participants are the eighth child or didn't answer the question separately, 0.49% of participants are the seventh child of their family.

Table 7 also shows the participants' order in family to attend college. The fourth panel shows the participants' order in their family to attend college, the fifth panel shows the corresponding percentage of students that were in each category. In looking at the Table, 48.02% of participants are the first child in their family to go to college, 30.19% of participants are the second child in their family to go to college, 13.36% of participants are the third child in their family to go to college, 4.45% are the fourth child in their family to go to college, 1.73% did not answer the question.0 .743% are the sixth child to go to college, 0.495% are the fifth to go to college, 0.248% are either the eighth, nineteenth, seventh, or tenth separately.

Table 8 shows the participants' in this study parental household status, type of housing, students' sports status, students' status on graduate school intentions and number of hours worked by participants. The first panel shows the participants' parental status, the second panel shows the number of students in the study who belong to each category of parental status household and the third panel shows the corresponding percentage of students that were in each category. In looking at the Table, 79.20% of participants came from a dual parent household. 14.85% of participants are from single parent households. 5.19% came from neither a dual or single household, 0.49% didn't answer and 0.25% answered the question with "not applicable."

The Table also looked at the types of housing participants permanently resided in, such as an apartment or house. The first panel shows the participants type of permanent housing, the second panel shows the number of students in the study who belong to each category and the third panel shows the corresponding percentage of students that were in each category. In looking at the Table, 91.08% of participants live in a house, 8.66% of participants live in an apartment, 0.25% did not answer the question.

The Table also looked at whether or not a student participated a sport and represented the college. The first panel details whether or not a student participated in a sport, the second panel shows the number of students in the study who belong to each category and the third panel shows the corresponding percentage of students that were in each category. In looking at the Table, 79.70% do not play a sport. 20.05% do play sports and 0.245% did not answer.

The Table also looked at whether or not participants intended to go to graduate school. The first panel details whether or not a student intended to pursue graduate studies, the second panel shows the number of students in the study who belong to each category and the third panel shows the corresponding percentage of students that were in each category. In looking at the Table, 52.72% of the participants do want to go to graduate school. 35.64% are unsure. 11.38% do not want to go to graduate school and 0.25% did not answer the question.

The Table also looked at whether or not a student worked while attending college and the number of hours they worked. The first panel details whether or not a student worked and how many hours, the second panel shows the number of students in the study who belong to each category and the third panel shows the corresponding percentage of students that were in each category. Of the 402 participants that answered the question about how many hours a week on average they worked 50.49% of student worked between 0 and 5 hours. 15.92% worked between 5.01 and 10 hours per week. 10.44% of students worked between 15.01 and 20 hours. 8.95% of students worked between 10.01 and 15 hours on average per week. 5.97% of students worked between 20.01 and 25 hours per week. 3.98% worked between 25.01 and 30. 2.23% worked between 35.01 and 40 hours. 1.74% worked between 30.01 and 35 and 0.25% worked over 40 hours per week.

Table 8: Parental Household Status, Type of Housing, Students' Sports Status, Students' Status on Graduate School Intentions and Number of Hours Worked by Participants

Parental Household Status	Number of Responses	Percentages (%)
Question was not Answered	2	0.49
The Student is from a Dual Parent Household	320	79.20
The Student is neither from a Dual Parent nor a Single Parent Household	21	5.19
The Question was Answered "Not Applicable"	1	0.25
The Student is from a Single Parent Household	60	14.85
Total	**404**	**100%**
Type of Housing	**Number of Responses**	**Percentages (%)**
Question was not Answered	1	0.25
The Student Resides in an Apartment	35	8.66
The Student Resides in a House	368	91.08
Total	**404**	**100%**
Students' Status on Participating in College Sports	**Number of Responses**	**Percentages (%)**
Question was not Answered	1	0.25
The Student does not Participate in a Sport	322	79.70
The Student Does Participate in a Sport	81	20.04
Total	**404**	**100%**
Students' Status on Wanting to Attend Graduate School	**Number of Responses**	**Percentages (%)**
Question was not Answered	1	0.25
The Student Does Not Want to Attend Graduate School	46	11.38
The Student is Unsure Whether They Want to Attend Graduate School	144	35.64
The Student Does Want to Attend Graduate School	213	52.72
Total	**404**	**100%**
Students' Hours Worked per Week (Done in Ranges)	**Number of Responses**	**Percentages (%)**
0 – 5	203	50.49
5.01 – 10	64	15.92
10.01 – 15	36	8.95
15.01 – 20	42	10.44
20.01 – 25	24	5.97
25.01 – 30	16	3.98
30.01 – 35	7	1.74
35.01 – 40	9	2.23
Over 40	1	0.25
Total	**402**	**100%**

This Table provides results for the type of parental household status, specifically looking at whether students belonged to dual or single parent household. It also looks at the type of housing, specifically whether students lived in an apartment or house as well as if students played a sport for the college. Finally, it provided results on whether student intended to attend graduate school and the number of hours they worked on a weekly basis.

Table 9 shows the participants' in this study source of funding for college and what percentages participants used for college from each source. The first panel shows the source of their college funding for each participant, the second panel shows the number of students in the study who used 0-25% from that particular source, the third panel shows the number of students in the study who used 25.01-50% from that particular source, the fourth panel shows the number of students in the study who used 50.01-75% from that particular source the second panel shows the number of students in the study who used 75.01-100% from that particular source . In looking at the Table, 63.11% used 0-25% of their funding from loans, 35.39% used 25.01-50% from scholarships, 53.21% used 0-25% from parents, 91.83% used 0-25% from family members, 92.07% used 0-25% from working and 93.31% used 0-25% from other sources.

Table 9: Source of Funding

Source of Funding	Number of Students Who Used 0-25%	Number of Students Who Used 25.01-50%	Number of Students Who Used 50.01-75%	Number of Student Who Used 75.01-100%
Funding from Loan	255 (63.11%)	76 (18.81%)	22 (5.44%)	14 (3.46%)
Funding from Scholarship	138 (34.15%)	143 (35.39%)	43 (10.64%)	33 (8.16%)
Funding from Parents	215 (53,21%)	68 (16.83%)	38 (9.40%)	36 (8.91%)
Funding from Family Members	371 (91.83%)	7 (1.48%)	7 (1.73%)	3(0.74%)
Funding from Working	372 (92.07%)	6 (1.48%)	1 (0.25%)	1 (0.25%)
Funding from Other Sources	377 (93.31%)	4 (0.99%)	4 (0.99%)	3 (0.74%)

This Table provides the results for the source of funding from which students accessed financial resources. It looks at different sources of funding and the percentage of that funding students accessed.

The correlation coefficient statistical analysis was used to analyze relationships between likely variables. Correlation coefficient or R is a measure of the degree of linear relationship between two variables. The value ranges from -1 to +1, the closer the results to -1 or +1, the stronger the relationship.

As shown in Table 10, there were some predictable and some not so predictable results. The first panel shows the relationships between loans taken by the students and a number of variables, the second panel shows the correlation coefficient values for a number of relationships and the third panel shows the level of significance. To begin, strong relationships were found between students taking loans and the longer they had been in school (-0.73) with the value indicating that the longer they were in school (4th versus lower years) the less likely they were to take loans. Students who had entered the college from another four-year college were also more likely to take loans (0.68). Students from families with higher incomes were also less likely to take loans (-0.71). Finally, a surprising result showed that students who were later in their family (fifth versus a second sibling) to go to college were also less likely to take a loan (-0.64).

Five moderate relationships were found. To begin, students who lived on campus (versus off) were more likely to take loans (0.41). Students who worked more hours were also more likely to take loans (0.39). Students born later in their family were also less likely to take loans (-0.52). As expected, students with higher GPAs were less likely to take loans (-0.43). Also as expected, students from dual-income families (single-income families) were also less likely to take loans (-0.56).

Weaker relationships were found for students, depending on the school they belonged to. Specifically, students from the School of Science were less likely to take loans (-0.32) and students who were planning to attend graduate school were also less likely to take loans (-0.31).

After developing the correlation coefficient, a regression was performed. The results are presented in Table 11 below. The first column shows the predictor variables (constant, major, source of entry into college, residence, number of hours worked, family income, order of birth, order of college attendance in family, GPA, single/dual family household and expected graduate attendance). The first variable (constant) represents the constant, also referred to in textbooks as the Y intercept, the height of the regression line when it crosses the Y axis. In other words, this is the predicted value of student loans when all other variables are 0.

Table 10: Correlation Tables and Results

Correlations Analyzed from Data	Correlation Coefficient Values	Level of Significance	Strength of Significance
Relationship Between Loans and Year in School	-0.73*	0.05	strong
Relationship Between Loans and School of Business/Arts/Science	-0.32**	0.10	weak
Relationship Between Loans and Source of Entry (high school, community college, 4 year college)	0.68*	0.05	strong
Relationship Between Loans and residence (on campus versus off campus)	0.41**	0.10	moderate
Relationship Between Loans and number of hours per week worked	0.39**	0.10	moderate
Relationship Between Loans and family income	-0.71*	0.05	Strong
Relationship Between Loans and order of birth in family (first/second/third child, etc.)	-0.52*	0.05	moderate
Relationship Between Loans and order of sibling to go to college	-0.64*	0.05	Strong
Relationship Between Loans and GPA	-0.43**	0.10	moderate
Relationship Between Loans and single/dual income family	-0.56*	0.05	moderate
Relationship Between Loans and going to graduate school	-0.31**	0.10	Weak

This Table provides results for the correlation analysis of student loans with other variables. The corresponding level of significance and the strength of the correlation is also noted.

The second column has B, which are the values for the regression equation for predicting the dependent variable from the independent variable. The regression equation would thus be presented as:

$$Y(\text{Student Loans}) = b_0 + b_1(YS) + b_2(M) + b_3(E) + b_4(R) + b_5(HW) + b_6(FI) + b_7(OrB) + b_8(OrC) + b_9(GPA) + b_{10}(SDI) + b_{11}(GSP) \tag{1}$$

This column of estimates provides the values for b0, b1, b2, b3 and b4, b5, b6, b7, b8, b9, b10 and b11 for this equation. The third column has the standard errors, these are the standard errors associated with the coefficients. The fourth column has Beta, these are the standardized coefficients. These are the coefficients that you would obtain if you standardized all of the variables in the regression, including the dependent and all of the independent variables, and ran the regression. By standardizing the variables before running the regression, you have put all of the variables on the same scale, and you can compare the magnitude of the coefficients to see which one has more of an effect. The fifth and sixth columns have the values for t statistics and significance. – These are the t-statistics and their associated 2-tailed p-values used in testing whether a given coefficient is significantly different from zero.

The Table shows results that shows the intercept value is -3.325. The higher the year in school, the less likely students would take loans (B=-.231, $p < .05$). Student in the field of science were less likely than their Arts or Business counterparts to take loans (B=-.360, $p < .10$). Students who came directly from high school, the more likely students would take loans (B=.137, $p < .05$). Students who lived on campus were more likely students would take loans (B=.137, $p < 0.10$). The higher the number of hours worked, the more likely students would take loans (B=.192, $p < 0.10$). The higher the family income, the less likely students would take loans (B=-.890, $p < .05$). The higher the order of birth in the family, the less likely students would take loans (B=-.455, $p < .05$). The higher the order of going to college as a child in the family, the less likely students would take loans (B=-.274, $p < 0.05$). The higher the GPA, the less likely students would take loans (B=-.321, $p < 0.10$). The students from a dual income family home, the less likely students would take loans (B=-2461, $p < 0.05$). The more likely they are to be going to graduate school, the less likely students would take loans (B=-.253, $p < 0.10$). The adjusted R-squared value of 0.388 from the regression model indicates that 38.8% of the dependent variable is explained by the eleven independent variables.

Table 11: Regression Results

Model	B	Standard Error	Beta	t	p
Constant (Intercept)	-3.325	.186		-9.728	<0.05
Year in School(YS)	-.231	.060	-0.065	-3.838	<0.05
Major (M)	-.360	.068	-0.082	-5.280	<0.10
Source of Entry (E)	.137	.064	0.035	2.146	<0.05
Residence(R)	.196	.048	0.061	4.118	<0.10
Number of hours per week worked (HW)	.192	.082	0.033	2.352	<0.10
Family Income (FI)	-.890	.038	-0.280	-3.468	<0.05
Order of birth in family(OrB)	-.455	.020	-0.027	-2.336	<0.05
Order of sibling to go to college (OrC)	-.274	.003	-0.064	-5.192	<0.05
GPA	-.321	.044	-0.089	-7.280	<0.10
Single/dual income family (SDI)	-.246	.039	-0.149	-12.040	<0.05
Graduate school Potential (GSP)	-.253	.064	-0.050	-3.972	<0.10

R-squared = 0.491 and adjusted R-squared =0.388 This Table provides the results of the regression analysis. It includes results for the unstandardized coefficients, the beta values, the corresponding values for standard errors, the standardized coefficients, t values, levels of significance and confidence intervals.

CONCLUSION

The purpose of this study was to examine patterns of funding for college students' tertiary education. In essence, how were college students funding their college education? Was this primarily through loans, scholarships, working, parental or family assistance? The sample for this study was derived from students at a primarily undergraduate college, located in upstate New York, in the suburb of Albany. The students who participated in this study included freshmen, sophomores, juniors and seniors. A total of 432 students ultimately completed from the three Schools at the college, namely the School of Liberal Arts, the Schools of Business and the School of Science. The survey was completed by the students between April and June 2018. These 432 students represented a response rate of 62%. Some students were sent an email soliciting their participation in an online questionnaire. Other students were read a script in class by their professor, again soliciting their participation in either a hard copy or an online questionnaire. The questionnaire was designed to assess the source of funding for the students' college education. In the questionnaire, participants were asked to respond with varying degrees of intensity in regards to the source of their college funding, as well as demographic data (such as age, gender, family income, sports involvement and living arrangement).

A key overriding question was posed at the beginning of this study - specifically this key question addressed what were the factors that lead to students taking out loans for college. With regard to this overall question, five factors indicated a strong relationship for the students who took loans – namely students taking loans and the longer they had been in school, students who had entered the college from another four-year college were also more likely to take loans, students from families with higher incomes were also less likely to take loans and students who were later in their family to go to college were also less likely to take a loan

In addition, five moderate relationships were found. To begin, students who lived on campus were more likely to take loans, students who worked more hours were also more likely to take loans, students born later in their family were also less likely to take loans, students with higher GPAs were less likely to take loans and students from dual-income families (single-income families) were also less likely to take loans.

Weaker relationships were found for students, depending on the school they belonged to. Specifically, students from the School of Science were less likely to take loans and students who were planning to attend graduate school were also less likely to take loans.

The result on family income and the negative relationship it had to students taking loans was echoed in a previous study by Breier (2010) – showing that we can have confidence in the current data. Bertolas' (2018) study on athletes found that NCAA founded athletes were less likely to take college loans. While a significant relationship cannot be shown between these two variables in the current study. Handwerker's (2011) study on students and college loans found that parents were likely to keep working longer years to support their college attending students, even postponing retirement. The results in the current study may partly allude to this, as we see students later in line in the family being less likely to take loans – maybe relying more on their not-yet-retired parents. Cheng et al's (2012) study found that students with more family social support were less likely to take loans. This could be seen as in keeping with the current study, which found that siblings who were later in line to attend college were less likely to take loans – possibly an indication that such credit sources are not needed since the students were obtaining support from other or previous family members. The regression stated that

Overall, the results of this study provide sound knowledge and reliable information that a variety of critical factors affect college student funding and the extent to which students will take loans, based on demographic, socioeconomic and perceptual factors.

Were there limitations to the current study? Absolutely. This limitation began with the sample, a convenience sample of students that is taken from a small liberal arts college in upstate New York. Furthermore, while the students covered all three colleges, namely Business, Arts and Science, there was some skewing of numbers towards Business students versus students from the other areas. However, stylized facts that could be most valuable for interested parties include conclusions made in this study regarding the source of college funding and the factors that impact the reasons impacting the necessity for increased college loans.

A future follow up study with a similar sample of students will be conducted in Spring 2019 and is expected to look at how additional variables, namely internships before and during college, GPA before college, race and college advising before and during college, impacted the source of students' financial sources for college. Future follow up studies could also extend the current study to a larger sample of students from different perspectives, increasing the generalizability of the findings related to this topic.

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GENDER BIASES IN THE COLLEGIATE EDUCATION SYSTEM

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ABSTRACT

Recently, societal norms have been changing as younger generations have started to break gender stereotypes. Because of these new social norms, a whole new world of opportunity has opened for women. This includes attending college or working in the business world. Women have enrolled in college, entered the workforce, and are working to improve life. With male and female population being both roughly 50%, there should be a correlation of male and female college acceptance rates. This study focused on the percent of females applying for college and their acceptance rates versus that of males. The results show, every year, the average percentage of female applicants accepted is higher than the average percentage of male applicants accepted. For five of the ten years followed, the chance the difference in the means watched is because of chance is too small, meaning there is a greater likelihood the difference is because of there being real differences between male and female applicants. The next steps would be to research further into the data and considering just studying the trends in two- and four-year schools only. Another interesting finding to look further into is why there is a negative correlation for the academic year variable with the percent of female and male applicants are accepted.

INTRODUCTION

O ver the past few years, it has become clear that females are outnumbering males in the college scene (Lopez, 2014). Studies have shown the reasons that females go to college are different from those of males; females tend to believe that if they are to enter the working world, they need a college degree (Nuland, 2013). Males are less likely to think like this and are more likely to connect going to college with getting a higher income (Nuland, 2013). As the barriers to entering the labor markets for women is lowering, universities are seeing a surge in female applications (Nuland, 2013). These trends are important to monitor to ensure females are provided the same access to education as males. Because the population is roughly fifty percent male and fifty percent female, the natural assumption would be that on average, the acceptance rates for men and women would be roughly the same (Hesketh and Xing, 2006).

Because there is a swell of females applying for and attending college across all nationalities, it is important to know that colleges are accepting around the same percentage of students (controlling for causes like SAT and ACT scores that do not meet the requirements). Simply looking at the number of male and female students will not bring any light to the subject since we already know that more females are attending college. Looking at percentages of accepted applications will better help the study of this topic.

The balance of this work is organized into the following four sections. First, there is a literature review looking at prior literature that informs this study. The next section includes methodology, including both the research question and experiment design. The third section includes the research findings. Finally, the research ends with conclusions, including limitations and future research.

LITERATURE REVIEW

Recent literature has suggested that higher numbers of high school graduates are now attending college, and these numbers have been rising for the past few decades (Lopez, 2013). Several studies identify the growing disparity in college enrollment between males and females. The difference between the white male and white female high school graduates enrolled in college in 2012 was ten percent. Seventy-two percent of enrollees are female while 62 percent are male (Lopez, 2014). This trend holds true for minorities as well, and in 2012, 76 percent of female Hispanic high school graduates went to college, which held a 13-percentage point lead over the Hispanic males. As for Asian high school graduates, females had a 3 percent lead on the males, and African-American females were 12 percentage points higher than the males (Lopez, 2014).

Nuland & Ingram (2013), considered something more than just what percent of females and males were going to college. They decided to look at the *why* behind people attend college, particularly the difference between males and females. Prior research suggested that males do not connect going to college with entering the workforce, whereas females do, so a female's decision to go to college is linked to their plans to enter the workforce (Nuland, 2013). This makes sense because as the 'glass ceiling' for females has been lifting, it becomes more and more worthwhile for them to attend college and receive a higher education that they can then use towards a career.

Nuland and Ingram's study did not focus solely on whether being a female makes one more likely to go to college, or what their reasons are. They also looked for confirmation of the benefits of attending college, and the effects of personal demographic information, family circumstances and high school performance on the likelihood of an individual attending college. They used the data from the National Longitudinal Surveys of Youths from 1997. Specifically, in the data they used a variable that indicated college attendance, a dummy variable to suggest whether the respondent was raised in an urban environment, another variable meant to summarize family situations, for example, how many years of education their mother and father had and the family income. They also used a variable for the SAT math score but dropped the variable for SAT verbal scores due to the high correlation with the math variable, and because the variable was statistical insignificance in their regression (Nuland & Ingram, 2013). With these variables, they decided to run a Chow test, and see which variables were significant at the .01 level. The regression model they used explained 15.2 percent of the variability in the decision to attend college, and the results for the female variable were statistically significant and shows that being female increases the likelihood of attending college by 18.77 percentage points (Nuland & Ingram, 2013).

Another two-study investigation, conducted by Keiser, Sackett, Kuncel, & Brothen (2016), focused on how standardized testing like the SATs and ACTs underpredict how females will perform in college based on their GPA. In layman's terms, it means that when comparing the GPA of a female and a male that scored the same on the SAT or ACT, the female's GPA are higher. They wanted to study this further and decided there are two causes that can be causing this; the first is that females are more conscientious than males, meaning they wish to do what is right, especially to do one's work or duty well and thoroughly. This would be reflected in the grades they receive in class, which would explain why their GPAs are higher. The second is that females tend to take 'softer' majors than males, and easier classes, which would also explain why their GPAs are better (Keiser et al., 2016). Their study is divided into two parts, one that focuses on the underprediction of GPAs for females, and the second that focuses on the idea of females taking easier courses then males.

For the first study in this two-study investigation, they obtained their data from a large Midwestern university and specifically targeted all the participants in an introduction to psychology course that is highly structured, meaning the instruction and grading standards are consistent each semester. Their statistical analysis took many different variables into account for this study, needing the subjects to take certain added tests from the coursework and going to the university and other sources for the information they needed. They include ACT scores, gender, the course grade received in the psychology class, the total exam points, total quiz points, and total discussion points earned over the course of the psychology class, their cumulative GPA (recalculated without the psychology grade included to create independence between the two variables), and the results from the Berkeley Personality Profile (to get a measure for their level of conscientiousness) that they all took prior to taking the psychology class (Keiser et al., 2016).

The results from Keiser's study showed that males had higher scores on the ACT, but females had higher GPAs. On top of this, it was discovered the ACT did not underpredict the quiz and exam points that females earned, but what it did under predict was the less cognitive pieces of the grade in the course, for example, the discussion points earned. By the end of the study, the results revealed that conscientiousness does explain a portion of a female under prediction. The trait of conscientiousness mostly impacts the more discretionary parts of a student's grades, like the discussion points, which is enough to partially explain why female's SAT and ACT scores are not predictive of how females will perform in college because they do not test those sorts of skills.

The second study in this two-study investigation accessed a new data source from the College Board. This dataset included variables like academic aptitude, first-year GPA, course grades, gender, course challenge, and mean aptitude in the course (Keiser et al., 2016). The results they found affirmed that females have higher GPAs than their male counterparts and the males still had higher SAT and ACT scores. But regarding the course challenge levels, the males had a higher mean than the females, meaning that they were indeed taking harder courses than the females. This means the SAT and ACT scores are over predictive for males because they tend to take more challenging courses than females (Keiser et al., 2016). Also, the academic competition in the courses that males are taking also tends to be higher than the classes that females are taking. An explanation for this the fact that females tend to be drawn to less rigorous program and classes than men. For example, medical doctors and engineers are male-dominated degree programs while nursing and secretarial programs are female dominated. Solely looking at SAT and ACT scores without applying to degree programs where students are registered is not acceptable (Keiser et al., 2016).

This leads to the current study being conducted. Because of all the information gained from previous studies, like how more females are attending college, and that they have different reasons than males do for attending college, and that they are more likely to perform better than their SAT and ACT scores predict, and the percentage of females that apply to college and are accepted is greater than the percentage of males that apply to college that is accepted, it is time to look at whether or not the under predictability of the SAT and ACT scores for females is keeping them from entering graduate school.

METHODOLOGY

The data used for this study is the 'IPEDS Analytics: Delta Cost Project Database 1987-2012 (CSV), which can be found on the National Center for Education Statistics website [https://nces.ed.gov/ipeds/deltacostproject/]. This study uses the file that contains only the 2000 – 2012 data. The data was collected by the Delta Cost Project at American Institutes for Research (AIR), which was established in 1946. They contribute to conversations about college education and the barriers that continue to grow for those looking for higher education, like increases in the cost of tuition and decreases in state support. Since college affordability is such a huge topic, the Delta Cost Project conducts annual surveys that gather information from every college, university and technical and vocational institutions that

share in the federal student financial aid programs. The dataset is constantly updated to allow for analyses of trends to be as up-to-date as possible, keeping conversations about the cost of higher education and what can be done about it continuing.

The data was read into SAS for all future statistical tests to be run on it. A Proc Means was administered on two numeric variables in the data; 'groupid' and 'Isalarytotal', which are the first and last numerical variables in the data set. We took the count and sum of the variables and compared them to what was found in the original excel file to ensure that all the data had been read incorrectly and the calculations in SAS were working properly with the data.

After thorough searches through the data dictionary that comes with this data set, a few variables of interest that relate to the goal of this study were discovered. This dataset includes variables for the number of applications a school has received, and how many of those were male and female. On top of this, the data has variables that show how many applicants were accepted, and how many of them were male or female. We can use this data to examine the rate at which females than males are attending college and see how it has changed over the 12-year period. In addition, this research will examine the percent of female applicants that are accepted, and the percent of male applicants that are accepted. These numbers are not describing the number of students that ended accepting an offer from the university or college, but those that were accepted by the university or college. The study does not look at which college the students ended going to, just the actions of the colleges and universities themselves. We want to discover how the colleges and universities behave on accepting students based on the variable gender.

FINDINGS

Two variables are being observed in the research; the percent of male applicants that were accepted (appadmp) and the percent of female applicants that were accepted (appadwp). The descriptive statistics can be found in Table 1 in the appendix. They show the standard error of both variables is .001, which represents the sample means deviation from the population mean. That means the data is an accurate portrayal of the true population.

Table 1: Descriptive Statistics for the Population Mean of the Percent of Male Applicants Accepted and the Population Mean of The Percent of Female Applicants Accepted

Variable	N	μ	σ	SE
appadmp	23,296	0.671	0.225	0.001
appadwp	23,303	0.683	0.224	0.001

This table shows the descriptive statistics. This includes the population, mean, standard deviation and standard error for each of the two variables.

Table 2: Moments and Tests for Normality for the Variables

	Skewness	Kurtosis	K-S (p > D)
appadmp	-0.48	-0.07	0.07 (0.01)
appadwp	-0.52	-0.30	0.07 (0.01)

This table shows the Tests of Normality for the variables. This includes the skewness, Kurtosis and the difference between them.

Before running any tests on the data, the data needed tested for normality. Table 2 shows different statistics for the variables appadmp and appadwp. Both have seemed to be slightly skewed to the left, as shown by the skewness and kurtosis statistics, and the Kolmogorov-Smirnov statistics seem to hint the data may not be normal. But looking at Figures 1 and 2, which display the distribution plot of the variables appadmp

and appadwp respectively, the data looks to be roughly normal. Further analysis may be required, but for this study, the data will be assumed roughly normal. In Figure 1 below this can be seen.

Figure 1: Distribution Plot of Variable appadmp
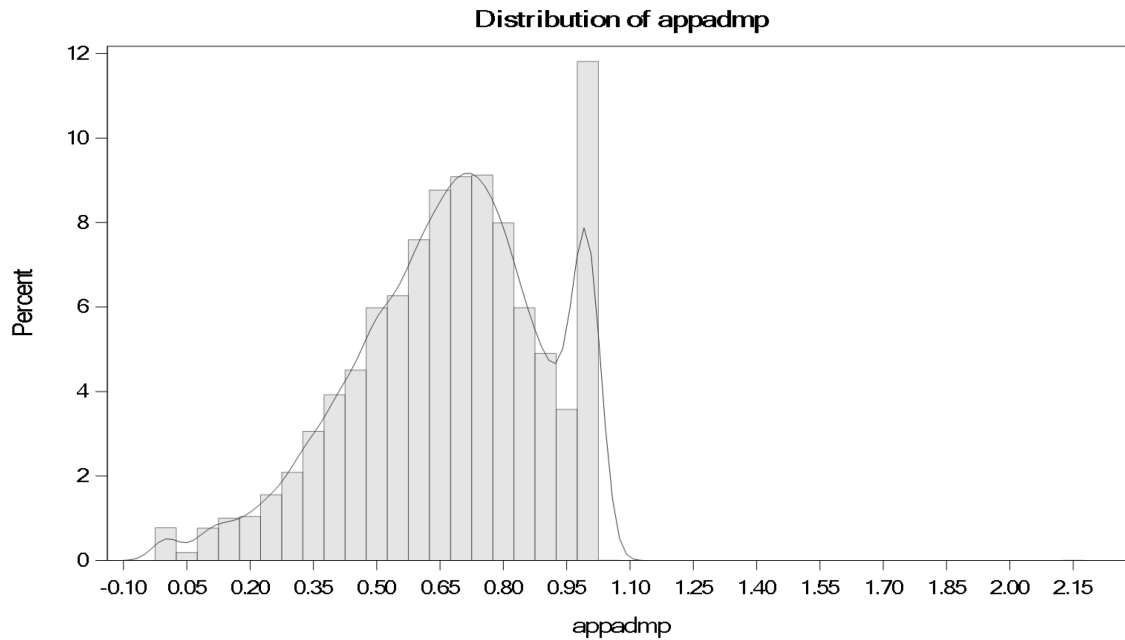
This figure shows the Distribution plot for the variable appadmp.

A similar situation can be seen for the second variable. This can be seen in Figure 2 below.

Figure 2: Distribution Plot of Variable appadwp

This figure shows the Distribution plot for the variable appadwp.

A correlation of the two variables being studied with the academic year (2003 through 2012) is shown in Table 3.

Table 3: Correlation Matrix

	appadmp	**appadwp**	**academicyear**
appadmp	1.00		
appadwp	0.87***	1.00	
academicyear	-0.08***	-0.09***	1.00

This table shows the correlation of the two variables studied with the academic year.

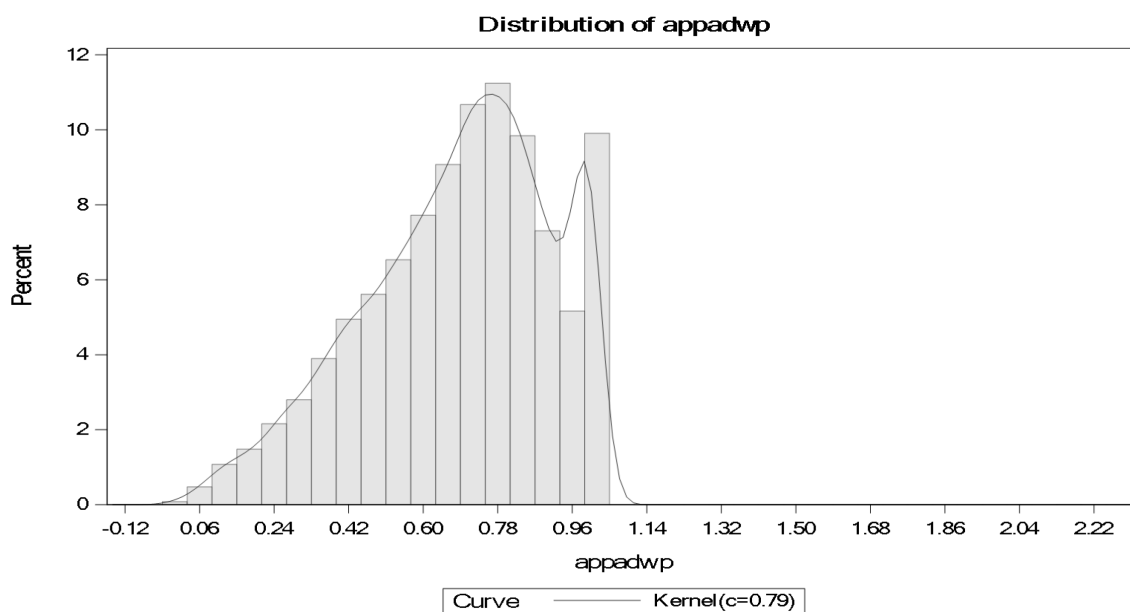The correlations between all variables are statistically significant, and the strongest correlation is between appadmp and appadwp, which has a positive relationship. This means that as the percent of male applicants accepted increases, so does the percent of female applicants accepted. An interesting relationship that appeared in the data is that between the academic year and the variables appadmp and appadwp. Both have a slightly negative correlation, meaning that as the year increases, the percent of applicants for both genders that are being accepted decreases slightly. It is a slightly stronger negative correlation between the academic year and the percent of female applicants that are accepted.

After examining the differences in admission rates by gender by academic year, we then sought to determine if the phenomenon being observed – that females had higher admission rates that males – was occurring across all post-secondary institutions, or in certain sectors. In order to accomplish this task, we administered a one-way ANOVA (analysis of variance), which is a methodology ideal for comparing means across multiple samples (Berenson, Levine, & Szabat, 2014). In addition, the statistical signficance of any difference was assessed using the Student-Newman-Keuls (SNK) test (Cody & Smith, 2006).

In our case, we recalculated the mean admission rates for males and females by academic year by post-secondary education sector, and then subtracted the female rate from the male rate in order to obtain the mean difference. A negative difference indicates that females have a higher admission rate than males, and are highlighted in Table 4 in yellow for easier visibility. With regard to the post-secondary education sector, the Integrated Postsecondary Education Data System (IPEDS) uses the following classification scheme:

Three groupings for degree type: 4-year (Bachelors degree or higher), 2-year (Associates degree), and < 2-year (Certifications). Three groupings for type of institution: Public Non-Profit, Private Non-Profit, and For-Profit institutions. Thus, there are nine post-secondary education sectors in the IPEDS data set (three degree-groupings X three institution-types). This is shown in Table 4.

Table 4: Mean Difference Analysis (t-test and ANOVA)

Academic Year	Percent Admitted		t-test	ANOVA on Difference (% Men Admitted less % Women Admitted)								
				4-Year			2-Year			< 2-Year		
	Men	Women		Public	Private	For Profit	Public	Private	For Profit	Public	Private	For Profit
2003	0.697	0.712	-2.29*	-0.019	-0.027	0.025*	0.015	0.022*	0.009	-0.016	-0.009	-0.041*
2004	0.695	0.710	-2.29*	-0.018	-0.024	0.004	0.005	0.006	0.001	-0.008	-0.026	-0.019
2005	0.685	0.697	-1.90	-0.017	-0.020	0.020	0.021	-0.004	-0.017	0.027*	-0.007	-0.027
2006	0.678	0.694	-2.49*	-0.014	-0.019	0.004	-0.007	0.011	-0.026	-0.006	0.001	-0.044
2007	0.674	0.686	-1.73	-0.015	-0.015	0.024*	-0.004	-0.006	-0.013	0.027*	-0.056	-0.034
2008	0.663	0.676	-1.96*	-0.017	-0.018	0.019	0.006	-0.006	-0.010	0.015	0.008	-0.033
2009	0.653	0.669	-2.37*	-0.016	-0.017	-0.009	0.013	-0.017	-0.013	0.006	0.046*	-0.036
2010	0.662	0.670	-1.26	-0.015	-0.015	0.009	0.003	0.036	-0.013	0.030	0.087*	-0.016
2011	0.631	0.641	-1.43	-0.015	-0.016	0.025	0.012	0.012	-0.033	0.007	0.021	-0.031
2012	0.659	0.662	-0.42	-0.015	-0.016	0.041	0.041	0.052	-0.006	0.020	0.017	-0.015

This table shows the mean difference analysis by academic year. The leftward columns show the mean admission rates by gender, along with the t-test results. After the t-test, ANOVA results are shown, with differences that are negative indicating that women were accepted at a higher rate than men. Differences that are significant at the 5 percent level are marked with an *.

The ANOVA results shown in Table 4 indicate that three sectors – Public 4-Year, Private 4-Year, and For-Profit < 2-Year - consistently admit females at a higher rate than males. Institutions in the Public 4-Year and Private 4-Year sectors are considered 'traditional' 4-year colleges and universities, and add additional credibility to our initial findings that females have gained an advantage in terms of college admissions in the United States. However, the For-Profit < 2-Year sector caught our eye, in that it is the only other sector that admits women at a consistently higher rate than men. The majority of institutions in this sector are in fields such as 'beauty' and 'cosmetology', so it is not surprising that females have higher admission rates than males.

Interestingly, no other sector of the U.S. post-secondary education system consistently admits females at a higher rate than males. Quite the opposite, 4-year For-Profit institutions tend to consistently admit more males than females. In the 2-year sectors, the story is mixed, with some years admitting more females and other years more males. Nonetheless, these additional ANOVA results support our initial t-test results: 'traditional' 4-year public and private colleges are admitting more females than males, and this is occurring on a consistent basis.

A PATH FORWARD

Because of how society is changing, and the different perceptions of women in the workplace, more and more females are attending college, and for mainly different reasons than male students. Since standardized tests like the SAT and ACT underpredict female performance in college, and that females do better because they are more conscientious than males. Research had been done in this subject before, but to add to it, this study looked at the percent of male applicants that get accepted compared to the percent of female applicants that get accepted.

CONCLUDING COMMENTS

This research looked into the question of whether women are being held back from education based on SAT scores. Researcher's designed this study to look at the differences between gender and how they handle education.

The goals were to explain the disparity between the common instance of higher female grade point average and work ethic, and the lower SAT scores that bar women from achieving an upper level education. These results are important because they show that colleges, universities, and other higher education institutions are tending towards accepting the same percent of females as they are males. Something that can be worrying for any students applying for higher education institutions is the percent of male and female applicants that are accepted is slightly negatively correlated with the academic year. This study did not separate trade schools or beauty schools from two- or four-year institutions in the data set, and looking at them separately may bring better insight on these trends. Researcher's removed schools having either zero female or zero male applicants from the study to make sure that we were examining schools that had to choose between accepting both male and female students.

The results show there have been significant differences between the average percentages over five years, meaning that it isn't because of random chance, but there is a difference between male and female applicants because the female average percent of applicants accepted is higher than that of the males.

This research has several benefits. One of which is the fact this study proves SAT scores are not a correct marker for forecasting the success of all students. Hopefully, this study inspires the education system to take this into account and weigh standardized test scores less than grade point average and professional recommendations. It also provides insight into fundamental gender differences that are applicable to

broader research regarding female and male lifestyle. Other researchers can use the information provided as a reference and build off what has been gathered and hypothesized here.

The limitations of this study include the inability to sort out the trade and beauty schools from the rest of the data. This may have skewed results due to the high female students in beauty school and the high-level of males in trade school, both of which do not accurately portray the typical male-to-female ratio found in two and four-year universities. It is also difficult to find out the number of applicants that were accepted but chose not to go. This lack of information does impact the accuracy of the findings.

This study has many opportunities for future research. The next steps should include further research on the data, separating out trade and beauty schools, and other miscellaneous schools, from the two- or four-year colleges and universities. Another step that could be taken would be looking further into the slight negative correlation between the academic year and percent of applicants accepted. It could be because there are more students applying to schools, but schools are not growing as fast and accepting roughly the same number of students each year. The data could also be viewed by state or region to further investigate the differences in the average percent of applicants accepted between male and female students.

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SKEWNESS, CRYPTOCURRENCY, AND PEER-TO-PEER LOANS: AN ASSET ALLOCATION EXERCISE FOR A UNIQUE STUDENT-MANAGED FUND

Lynda S. Livingston, University of Puget Sound and Four Horsemen Investments

ABSTRACT

We incorporate skewness and kurtosis into an optimization process for a unique student-managed fund. Unlike the vast majority of such funds, which hold only equity, our fund includes REITs, cryptocurrency, and peer-to-peer loans. Adding these unusual asset classes allows our students to explore portfolio management concepts more generalizable than just picking stocks. While most of our assets cannot be recommended based solely on traditional mean-variance analysis, they nonetheless offer beneficial contributions. Using polynomial goal programming to incorporate higher moments in our optimization, we find that asset classes dominated in mean-variance space can make meaningful contributions to the full risk-return profile of the portfolio. In particular, we find that including cryptocurrency and peer-to-peer loans can increase the skewness and decrease the kurtosis of our portfolio.

INTRODUCTION

Many universities offer finance students the opportunity to run student-managed funds (SMFs). Most of these funds are large, actively managed equity pools, often funded through the institution's endowment and tied to its structured curriculum. But why do almost all SMFs focus only on equities, if more than 90% of a professionally managed portfolio's return variance is explained by strategic asset allocation across multiple asset classes (Brinson, *et al.*, 1986)? Why do most SMFs stress stock picking, if active equity management is almost certainly doomed to fail? (See Sharpe, 1991, and Sharpe, *et al.*, 2014, for the nuances behind these assertions.) Our unique SMF does not focus on stock picking. Instead, our small, independent fund—run through a not-for-profit corporation established by students—manages assets most others do not: REITs, peer-to-peer loans, and cryptocurrency. Our students explore fundamental asset-class distinctions and portfolio optimization techniques. Our fund demonstrates that any school—no matter how small—can create meaningful, comprehensive experiential learning opportunities for portfolio management students.

In this paper, we show how our members approach the strategic asset allocation for our portfolio. We start with traditional mean-variance criteria, using corner portfolios and Excel's matrix manipulation capabilities (see Arnold, 2002) in a constrained optimization. More interestingly, we then expand the objective function to include skewness and kurtosis, using polynomial goal programming to re-optimize. We find that the inclusion of our non-equity "experience assets" can significantly improve our portfolio's characteristics.

Our approach is not specific to student-managed funds. Practitioners are increasingly confronted with the messy reality of negatively skewed and fat-tailed asset returns. By introducing students to broader

optimization techniques like polynomial goal programming, we can help move professional money management beyond the mean-variance efficient frontier.

The paper proceeds as follows. In the next section, we review the relevant literature. We then describe our data, paying particular attention to our cryptocurrency returns. Next, we describe our mean-variance and four-moment asset allocation optimization. We summarize in the final section.

BACKGROUND AND LITERATURE REVIEW

Our research draws on the literature on student managed funds, asset allocation, and optimization with higher moments. We consider each in this section.

Student-Managed Funds and Four Horsemen Investments

Managing financial portfolios is complicated. To help finance students prepare for the challenge, many universities have established student-managed funds, pools of assets run by students and providing them with active, hands-on experience in the financial markets. From our perspective, the problems with most of these funds are in their focus on actively managed equity and in their restrictions on student participation and leadership to a stringent curriculum.

The vast majority of SMFs are equity funds. For example, in Neely and Cooley's (2004) sample of 61 SMFs, only four are dedicated debt funds, while 40 are equity-only. Peng *et al.* (2009) and Morgan (2008) find similar equity bias in their samples. Universities emphasize this bias: websites touting student-managed funds highlight the opportunities for students to research and pick stocks (e.g., University of Chicago), to "pitch" stocks (University of Miami), to employ industry and sector rotation (Villanova), and to practice Benjamin Graham/Warren Buffet-style value investing (University of Connecticut). The opportunity to manage multiple asset classes is noticeably absent. One exception is Fordham University, which proudly states that, "While other universities' students are restricted to investing in domestic stock, Fordham undergraduates have the freedom to experiment with international and domestic securities, bonds, commodities, and foreign exchanges" (Fordham, 2018). However, even Fordham does not allow students to venture into more unusual asset classes, such as peer-to-peer loans or cryptocurrency. (Of course, some may argue that a student-managed fund has no business incorporating these sorts of assets. However, as Yau, *et al.*, 2007, note: "Portfolio managers who understand alternative investments have a substantial advantage over those who do not." Considering this position is one of the goals of this paper.)

In addition to being equity-focused, most SMFs are also funded through the sponsoring university's endowment and supported by its academic curriculum. (For an overview, see Peng, *et al.*, 2009, and Mallett and Lerro, 2001.) For example, Trinity University's SMF was established through a $500,000 allocation from its endowment. It is managed through a one- or two-semester, senior-level course, requiring three additional prerequisites (Trinity, 2018). The University of South Florida requires its student managers to take a two-semester securities analysis course as part of the requirements to manage its half-million dollar portfolio (USF, 2018). At the University of Puget Sound, our SMF was established through a targeted $100,000 gift to the endowment, and is supported by two specially created courses, valuation and portfolio management.

As is suggested by the sizes of the three funds just described, student-managed funds are typically hundreds of thousands or millions of dollars in size. In Peng *et al.*'s (2009) sample, only 18% of the funds were below $100,000; Neely and Cooley (2004) estimate a "modal" SMF size at between $200,000 and $400,000. (Give the age of these studies, fund sizes have undoubtedly grown; for example, the Trinity fund mentioned above is now worth more than $5 million.) The few funds that focus on debt are even larger. Morgan (2008) estimates a $1 million practical minimum for fixed-income funds, given that round lots in

this market are so much larger than those in equities. All of the debt funds in his sample exceed this minimum, with one—Iowa State University's—clocking in at $100 million.

Thus, the typical student-managed fund is a large, equity-only portfolio funded by a university endowment and tied to a structured curriculum. The Four Horsemen Investment fund, in contrast, is a small, diversified (but debt-heavy) fund run through an independent 501(c)(3) charitable corporation. It is also about more than the portfolio. Of course, we offer the experience of managing real money in real time, but we also perform research on alternative investments and fringe lending, and we provide meaningful outreach focused on financial literacy. Unshackled from any university's institutional constraints, we are able to allow our student managers (who run the corporation as well as the fund) to explore asset classes and strategies unavailable through traditional SMFs. Thus, unlike most student fund managers, our members are able to conduct meaningful asset allocation reviews. They also must grapple with the basic definition of an "asset class" and whether our experience assets—especially P2P loans and cryptocurrency—qualify. In the next section, we review relevant literature that has helped inform our understanding of our loan and coin assets and how they can contribute to our overall portfolio.

Peer-to-Peer Loans, Cryptocurrency, and Asset Classes

Four Horsemen Investments was able to create a small, debt-focused fund by investing in peer-to-peer (P2P) loans. These loans are personal loans facilitated by an online platform like Prosper or Lending Club. Potential borrowers post a "listing" on the platform, which assesses their creditworthiness. Lenders on the platform can then offer to fund all or part of the loan, bidding as little as $25 on any given loan. If the loan garners enough offers to be fully funded, the platform will make the loan and handle the distribution of payments among the participating lenders. (See Herzenstein, *et al.*, 2008, Iyer, *et al.*, 2009, and Freedman and Jin, 2008, for descriptions of this market.)

With our founding donation of $1,000, 4HI was able to create a diversified portfolio of these P2P loans. Members were able to do meaningful credit analysis and develop useful default models—not only moving beyond standard active equity management, but moving beyond corporate bonds. This model allowed us to create a unique experience for students even without the support of our university's endowment.

However, the P2P market has changed dramatically since our founding in 2009. Observing the profit potential there, institutional investors have moved into the space, crowding out true "peer" lenders. (See, for example, Shore, 2014, and PwC, 2015.) For example, platforms now make arrangements with hedge funds to screen new loans before they are ever made available to peer lenders, allowing wholesale skimming of the best loans. Banks are also anxious to partner with the P2P companies, to take advantage of the platforms' user-friendly interface, cutting-edge technology, and efficient, low-cost underwriting (Schatt, 2014). Now that we have less access to good loans—and have seen our defaults rise, probably not coincidentally—we have had to reexamine our commitment to P2P loans. This was a major motivator for our first comprehensive asset allocation exercise, which we describe below. First, however, we discuss the other unusual asset in our portfolio: cryptocurrency.

Two years ago, we were very fortunate to receive a donation of two bitcoin from an alumnus. We had to decide whether we would immediately liquidate this windfall or attempt to incorporate the coins into our portfolio. Was our bitcoin just a weird type of cash, or was it a new asset class?

Both art and science are involved in defining an asset class. The definitions we choose directly determine the way we allocate our funds, how we monitor our performance, and how we effect our rebalancings. While there is a tendency to define asset classes the way Justice Potter Stewart defined obscenity ("I know it when I see it"; *Jacobellis v. Ohio*, 1964), there are some commonly accepted guidelines that our members consider. Swensen (2009) stresses that asset classes should be primarily distinguished by function: "broad,

sweeping differences in fundamental character." Within a class, assets should share similar statistical properties, and those properties should be different from those of other classes. Asset classes should be mutually exclusive and investable, and the set of classes should span the relevant and available universe (Byrne and Smudde, 2011). Finally, the asset classes should provide the "beta" component of return: since "[s]atisfying investment objectives proves too important to rely on serendipity or the supposed expertise of market players" (Swensen, 2005), asset classes "must raise the expected utility of a portfolio without requiring superior asset selections within the class" (Chauncey, 2002, citing Kritzman, 1999).

While most researchers and practitioners now agree that these criteria admit more than just debt and equity, opinions vary about what other types of assets deserve recognition as a practical class. For example, Goss (2012) evaluates the potential for a popular favorite—gold—to qualify. He finds that since the credit crisis gold's correlation to stocks has become unstable, while its correlation to inflation is "relatively modest." If there is another financial crisis, when any defensiveness of gold would be particularly welcome, Goss expects that the resulting flight to quality would make Treasuries the real hedge, while gold would act more like a risky asset. However, he believes that gold could be useful if "hedging against the implosion of fiat currencies becomes a truly dominant theme." Recognizing gold as an asset class, then, seems to be a consequence of one's assessment of that eventuality.

In other cases, authors have been more willing to assert asset-class status, and to assets more outside the mainstream. For example, Medina-Martinez and Pardo-Tornero (2013) determine that European Union Allowances (EUAs)—entitlements allowing polluters in the European Union to emit one ton of carbon dioxide—are an asset class because their returns exhibit a *set* of characteristics unlike either stocks' or commodity futures'. Like stocks, EUA returns are negatively skewed, but like commodities, they are positively correlated with fixed-income assets and with inflation. Given that the collection of EUAs' returns' statistical properties mirrors neither financial nor commodity assets, the authors declare EUAs a unique asset class.

Similarly, Campbell (2008) identifies art an asset class—and a "financial instrument"—on the strength of its apparent low correlation with equities. However, she also recognizes that the art market is illiquid, opaque, and highly volatile; it provides no periodic cash flows (unless pieces are rented); and it is "whimsical," trendy, and faddish. These latter characteristics make the market subject to bubbles, so she suggests subjectively adjusting any portfolio allocations in art. This is consistent with Swensen's (2009) admonition to portfolio managers to adjust historical optimization inputs to reflect reasonable prospective relationships. It is also the approach that we have taken with our own allocations to cryptocurrency (also called math-based currency, or "MBC"), which shares art's volatility and perhaps its trendiness.

Four Horsemen Investments holds both bitcoin and ethereum (we exchanged some of our initial bitcoin donation for ethereum, to diversify our MBC holdings). These are two of the more than 1,000 types of math-based currencies that exist (39 of which have market capitalizations over $1 billion; Rimkus, 2018). Schatt (2014) describes bitcoin—the oldest and best known of the MBCs—as "a new way of representing and exchanging value using cryptography, a peer-to-peer network, and a public transaction ledger." Bitcoins are long strings of letters and numbers that are generated by a complex, resource-intensive mathematical algorithm. Once generated, a bitcoin's movement—its transaction history—is tracked on an open ledger, visible to everyone (although the entities at either end of a transaction are "obscure"). That transparency is meant to engender trust in the currency, which is overseen by no central authority or government. Burniske and White (2017) view this decentralized, open-source governance scheme as the unique "politico-economic feature" that justifies recognizing MBC as an asset class, asserting—as Goss (2012) does with gold—that "macroeconomic uncertainty underscores its value proposition"; Schatt (2014) agrees.

Nonetheless, there are many bitcoin skeptics. Jamie Dimon called it a "fraud" (Karabell, 2017); Warren Buffet, a "mirage" (Rimkus, 2018). A general manager for the Bank of International Settlements declared that it was "neither a good means of payment, nor a good unit of account, nor… suitable as a store of value"—the three things a currency is supposed to be (Carstens, quoted in Rimkus, 2018).

In contrast, Schatt (2014) sees potential for MBCs to simplify very small payments—pennies—to vendors across the internet (perhaps for gaming or tipping). Nonetheless, in these early days, market participants do not seem focused on cryptocurrency as currency. Instead, most investors appear to hold MBCs because they expect them to appreciate. Glaser, *et al.* (2014) examine volume at bitcoin exchanges (where fiat currency is exchanged for cryptocurrency) and the blockchain (where cryptocurrency is traded for goods and services), and find that uninformed investors, spurred on by volatility, buy MBC as an alternative asset—despite there being no "valid valuation method" or "fundamental pricing methodology available." This enthusiasm by purchasers "limited in their level of professionalism and objectivity" has led many to declare a bitcoin bubble (see, for example, Hankin, 2018).

Bubble or not, given that the vast majority of bitcoin are currently saved, not spent, we see it as purely a speculative asset. Like art, MBC generates no intermediate cash flows, nor does it earn interest, as a currency deposit would. Therefore, we would not judge MBC appropriate for our portfolio in a basic mean-variance sense. However, Four Horsemen Investments has the luxury of being an educational not-for-profit, and, for us, having cryptocurrency is an opportunity to learn. (In fact, offering us this opportunity was one of the main motivations behind the donation.) We have it (and we have a sell discipline), so we are going to use it. Moving beyond the basic "What is it?" question, we are investigating MBC's potential to improve either the skewness or the kurtosis of our portfolio.

<u>Incorporating Skewness and Kurtosis into Asset Allocation</u>

These higher moments are becoming more salient for portfolio managers. The mean-variance approach of Markowitz (1952) defined portfolio optimization for a generation in part because of its relative tractability. However, we suspect that investors' utilities are not quadratic (so that mean and variance are not sufficient parameters to describe their preferences), and we observe that asset returns are not normally distributed (so that mean and variance are not sufficient to describe their choices). Stock returns, for example, are negatively skewed and leptokurtic (Singal, 2011).

In a portfolio, deviations from normality can have significant consequences. For example, positively skewed portfolios have better Sortino ratios and lower semideviations than negatively skewed portfolios (Kim, *et al.*, 2014). On the other hand, Harvey and Siddique (2000) note that assets whose addition would make a portfolio more negatively skewed must compensate investors with higher expected returns. These authors also suggest that conditional coskewness may help explain the equity premium puzzle and the size effect in returns. Davies, *et al.* (2004) assert that higher moments are necessary when assessing the risk profile of hedge funds, since all of the seven strategy groups that they studied (long/short, distressed, merger arbitrage, etc.) were fat-tailed and six were negatively skewed. The high degree of coskewness between funds in the same strategy group means that investors cannot effectively diversify skewness away—they must instead pay for more attractive skewness by accepting higher standard deviation.

These sorts of conjectures have led to an increased focus on skewness and kurtosis among practitioners. For example, these topics are now an integral part of the quantitative methods curriculum of the CFA (see, for example, deFusco, *et al.*, 2015), and are part of the mathematical underpinnings for professional risk managers (see, for example, Parramore and Watsham, 2015). However, it is difficult to incorporate higher moments into optimizations: the algebra is "intractable," giving rise to irrational polynomials that spawn very complicated isovariance curves (de Athayde, *et al.*, 2001). Kim, *et al.* (2014), noting that incorporating higher moments into the traditional objective function makes the problem non-convex, drastically increases

the number of parameters, and "makes it practically impossible to obtain reliable estimators," suggest using a quadratically constrained quadratic program (QCQP) to solve a robust version of the mean-variance objective function. Their robust portfolios maximize the worst-case outcome under mean-variance, which favors positive skew and penalizes kurtosis. Nonetheless, this method is computationally and analytically less accessible to undergraduate finance students.

We use instead the much more user-friendly approach of polynomial goal programming, which determines optimal portfolio weights given specific investor preferences over mean, variance, skewness, and kurtosis (see, for example, Lai, *et al.*, 2006, and Kemalbay, *et al.*, 2011). We will apply this approach to our portfolio, to gauge the portfolio impact of our experience assets (P2P loans, MBCs, and REITs) when we incorporate higher moments into our assessment. Before describing this process, however, we will describe our data.

ASSETS AND RETURN DATA

Assets

As noted above, we currently own equity (45% weight), peer-to-peer loans (8%), math-based currency (32%), and REITs (15%). In this section, we describe the use of these assets in our portfolio.

Our equity allocation is a return driver—as it is for almost all portfolios; nonetheless, unlike most SMFs, we approach it as an opportunity to teach members about the efficacy of indexing (rather than the probable futility of stock picking).

We break the equity class into domestic, foreign, and small-cap value, for which we use the Vanguard Index Funds S&P500 ETF (VOO; 13% of total portfolio), the Vanguard International Equity Index (VEU; 5%), and the Vanguard CRSP U.S. Small-cap Value Index ETF (VBR; 27%), respectively. Incorporating international stocks allows us to get some additional diversification (see Swensen, 2009); using a Vanguard index fund allows us to get it cheaply. On the domestic side, we clearly have not broken the space into mutually exclusive groups, so our approach is not based on a well-defined, macro-consistent asset class scheme (see Idzorek and Kowara, 2013). Nonetheless, we are unrepentant. We are very strong believers in the efficacy of the size and value factors, and we embrace any tilts in our domestic exposure with eyes wide open.

While equity is our return driver, math-based currency, the P2P loans, and REITs are our "experience assets"—assets we want our members to learn about. (We will consider the most novel of these, the MBC, in detail in the next section.) Of these three experience assets, we have the longest track record with the P2P loans. Our portfolio was created to hold these loans, and for many years they were the only asset that we held. To inform our expectations for our P2P investments going forward, we draw on a comprehensive review of the performance of our loans from our portfolio's inception in 2009, based on a census of our 131 Prosper loans and a matched sample of 343 Lending Club loans (described in Livingston and Crosby, 2017). As we note below, we will adjust our historic performance for the deteriorating state of the P2P market for small lenders like us.

Our third experience asset is our REIT, which is the newest addition to our portfolio. REITs are common in institutional portfolios (and individual ones, too, as they are one of the five asset classes that Swensen recommends for any personal portfolio; see Swensen, 2009). Nonetheless, they are not at all common in the equity-heavy world of student-managed funds. We added this allocation to help us diversify, to protect against inflation, and to generate cash for member reinvestment. Their versatility offers our members numerous options and research opportunities, since REITs can invest in properties from hotels and commercial real estate to farm and timberland. We have decided to invest in Weyerhaeuser Co. (WY), a

timber REIT that gives us a natural resources play reflecting our home in the U.S. northwest. (See Paolone, *et al.*, 2015, for an overview of REITs' investment characteristics; see Morawski, *et al.*, 2008, for a discussion justifying viewing REITs as a unique asset class.) Having described our assets, we now consider the return data that will drive our optimization.

Daily Math-based Currency Data

Later, we will be using monthly data to perform our asset allocation optimization. Nonetheless, understanding the daily behavior of our math-based currencies—experience assets—will help our members better appreciate our portfolio's inputs and potential.

We retrieved daily pricing data for both bitcoin and ethereum from Coinbase (coinbase.com). Coinbase has bitcoin data from January of 2013 and ethereum data from August, 2015, but we choose to look only at the last year (9/30/16 through 9/29/17). Before late 2016, both series showed relatively little variability (with the possible exception of bitcoin around December, 2013) and were not as familiar to most investors as they are now. We do not believe that the statistical properties of the return series pre-2016 will inform our estimates of their future behavior.

Table 1 provides the summary statistics for the two MBC ("coin") return series, along with those for the Dow Jones/Wilshire 5000, a broad-based market indicator. The "math-based currency portfolio" is simply an equally weighted portfolio of the two MBCs, which we will use in our asset allocation below. Both the means and the variances of the coins' returns are significantly larger than those for the market: the *p*-values for the equality of means tests for bitcoin and ethereum are 0.032 and 0.052, respectively, while those for chi square tests for equality of variances are both << 0.0001. (Our variance figure for bitcoin is roughly consistent with that shown in Burniske and White, 2017; see their Figure 23.) All of the series are positively skewed (which is not the expected situation for the market), although the coins are much more so. Similarly, while all of the series are highly leptokurtic, the coins' returns have about twice the excess kurtosis of the market.

Table 1: Summary Statistics for Daily Math-based Currency Returns

		DJW5000	Bitcoin	Rthereum	Math-Based Currency Portfolio
Full year:	mean	0.00035	0.00685	0.00837	0.00851
	variance	0.00002	0.00238	0.00477	0.00225
	coefficient of variation	13.3	7.1	8.3	5.6
	skewness	0.03	0.09	1.19	0.41
	excess kurtosis	2.5	5.6	4.6	4.4
Matched data:	beta	1	-0.12	1.58	0.73
	alpha	0	0.0069	0.0078	0.0074
	coskewness (gamma)	1	-4.8	-6.0	-5.4

This table provides the summary statistics for a year-long, daily series of returns for our two math-based currencies, for an equally weighted portfolio of those MBCs, and for a market indicator. The coin series are more positively skewed and fat-tailed than the market, and they show strong negative coskewness.

The bottom panel of Table 1 reports on some of the coins' returns relationships with the market. To find these values, we used a subsample of 199 of the daily returns. We used this subset because Coinbase gives coin values for all seven days of the week, while market data are reported only for business days. Since we are unwilling to make assumptions about the relative size of coin returns for market trading and non-trading days, we omit returns for both the market and the coins for weekends and holidays, leaving us with 199 return-days. (Thus, for example, we omit Monday returns, leaving us with four returns per week for weeks without holidays.) Using this sample, we find strong comovement between ethereum and the market, but slight oppositional movement for bitcoin. We do not have enough confidence in our data to view these values are much more than suggestive, however.

The magnitude of the coskewness numbers makes them interesting in spite of the data deficiencies. Both coin series have large, negative gammas. (Gamma is calculated as the asset's coskewness with the market, standardized by the market's skew: $\sum_{t=1}^{n}(r_{it} - \mu_i) * (r_{Mi} - \mu_M)^2 / \sum_{t=1}^{n}(r_{Mt} - \mu_M)^3$, where M denotes the Wilshire 5000; see Smith, 2007.) We would therefore expect them to make meaningful contributions to a portfolio when the market is negatively skewed (as it usually is). In Smith's (2007) estimates, assets with positive gamma would need to offer a premium of 1.81% when the market is negatively skewed, to compensate for their exacerbation of unattractive skewness; our negative-gamma coins should therefore be attractive in such a market. (This is the same sort of argument that supports commodity investing; see, for example, Medina-Martinez and Pardo-Tornero, 2013.) We will evaluate the coins' contributions to portfolio skewness further later in the paper.

To complete our discussion of the daily cryptocurrency data, we consider the possibility of autocorrelation. Using the 364-day sample, we find that the monthly variance is 39 times larger than the daily variance for bitcoin, and 137 times larger for ethereum; both are significantly higher than 30.33 times the daily variance ($p \ll .001$). We therefore could suspect some positive serial correlation. However, runs tests on both coins cannot reject randomness. Regressions of errors on lagged errors (using predicted values based on regressions of the coins' returns against the DJW5000, using the 199-day sample) also show no relationship. Thus, we have mixed signals about possible daily serial correlation. However, we will be using monthly data for our actual asset allocation work, which should mitigate any problems (via "aggregational gaussianity"; see Medina-Martinez and Pardo-Tornero, 2013). We turn to that monthly data now.

Monthly Data for Optimization

We base our asset allocation model on data from October, 2016 through September, 2017—twelve months' worth of returns. This is obviously a very small sample. However, as we noted above, we do not have confidence that earlier math-based currency data will be especially useful for projections. The same is true for our P2P data: our early portfolio data includes a significant number of Prosper loans, loans from lower grades, and loans chosen based on data available under now-defunct loan listing rules. As noted earlier, the P2P market has changed drastically over the past several years, as institutions have recognized the potential in the space, created funds devoted to P2P investing, and been given priority access to the best loans. Retail investing in P2P is much more treacherous than it was when we began our student-managed fund, reducing the relevance of our early experience to our current portfolio optimization. Table 2 summarizes the data from the monthly sample. The top half of the table is the correlation matrix; the lower half contains summary statistics, including skewness and excess kurtosis.

The math-based currencies are negatively correlated with the broader market indicators, to the REIT, and to the small-cap value ETF, mitigating their extremely high relative volatility. (Burniske and White, 2017, show a similar -0.39 correlation between bitcoin and the MSCI REIT index, using five one-year returns; their correlation between coins and the S&P500 was a higher 0.35.) The coins are also positively skewed and less leptokurtic than all of the other assets except for the international equity ETF and the REIT.

The P2P's potential is less obvious, despite the negative correlations. First, its mean return is negative. We have seen accelerating defaults as our portfolio has aged, and, as noted above, we do not expect dependable access to good loans going forward (see also Gillum, 2018). The small variance is not much consolation, since we expect that it is more an artifact of the measurement problems created by the relative opacity and illiquidity of the market than a reflection of return stability. P2P is also negatively skewed and fat-tailed. Nonetheless, given that our portfolio is a teaching portfolio, these undesirable P2P characteristics must be seen as challenges, not as disqualifiers.

Table 2: Correlations and Summary Statistics for Monthly Sample

	BIT	*ETH*	*P2P*	*VEU*	*VOO*	*VBR*	*WY*	*W5000*
BIT	1							
ETH	0.34	1						
P2P	0.19	0.42	1					
VEU: International	0.02	0.40	0.15	1				
VOO: S&P500	**-0.09**	**-0.24**	**-0.38**	0.11	1			
VBR: SCV	**-0.45**	**-0.52**	**-0.48**	**-0.36**	0.71	1		
WY: REIT	**-0.50**	**-0.07**	**-0.22**	0.12	0.65	1	1	
W5000	**-0.19**	**-0.28**	**-0.44**	0.07	0.98	0.81	0.67	1
Mean	0.196	0.469	-0.004	0.015	0.014	0.014	0.009	0.013
Standard Deviation	0.25	0.82	0.01	0.02	0.02	0.04	0.04	0.02
Maximum	0.70	2.16	0.01	0.04	0.04	0.10	0.08	0.04
Minimum	-0.11	-0.31	-0.03	-0.02	-0.02	-0.03	-0.05	-0.02
Skewness	0.98	1.24	-1.18	-0.75	-0.31	**1.31**	0.17	-0.36
Excess Kurtosis	0.48	0.66	0.93	-0.04	0.70	2.45	**-0.63**	0.98

This table summarizes the inputs to the portfolio optimization. Our "experience" assets are BIT and ETH (the math-based currencies); P2P (the peer-to-peer loans); and WY (the timber REIT). VEU, VOO, and VBR are our equity ETFs: international, S&P500 index, and small-cap value (SCV), respectively. The Wilshire 5000 is our market benchmark. Cells in black highlight potentially useful relationships: negative correlations, positive skewness, and negative excess kurtosis. Note that the coins and the P2P loans offer most of these promising relationships.

The historical data from Table 2 provide our optimization starting point. However, as Swensen (2009) stresses, "Some of the most egregious errors committed with mean-variance analysis involve inappropriate use of historical data," because "past returns provide perverse signals to backward-looking investors." We have therefore made some subjective adjustments to the realized metrics for our coin and P2P assets to reflect the performance we expect going forward, paying particular attention to expected returns, which are more influential on optimization outcomes than variances and correlations by at least an order of magnitude (Sharpe, *et al.*, 2014).

First, we raised our P2P return expectation from its small negative mean to 0.2%/month. Historically, our Lending Club portfolio has returned -.05% and 0.45% per month for higher- and lower-A ratings, respectively, including charge-offs (see Livingston, 2017). Since we intend to concentrate our future lending in these grades, we will use the average, 0.20%, as our expected return for the P2P asset class.

For the coin portfolio, we adjusted both the mean and the standard deviation. Coins have been incredibly lucrative since we put them into our portfolio in early 2017, but we certainly do not expect 20%/month return in the future. We have lowered our expected return to 2%/month—still high, but not excessive in our view, given the 1.5%/month historical return for the international ETF. As for the coins' standard deviation, we reduced the stunning 47%/month to 8%, based on the 28% annual standard deviation projected for private equity in Wilshire Consulting's June, 2018 asset class assumptions.

Finally, we evaluated our estimates for the timber REIT using NCREIF's timberland index (5.2% average return over 3- and 10-year periods; 7.1% over five years); the timberland/farmland/infrastructure assumptions in Milliman's 2017 public pension funding study (5.5% geometric mean; 14.5% annual standard deviation; Sielman, 2017); and the historical returns for the FTSE NAREIT All REITs index as quoted in Blanchett (2014) (12.21% mean; 18.48% standard deviation) and Blanchett and Straehl (2015) (12.36% mean; 19.76% standard deviation). These REIT values were comparable to our historical results, so we made no changes for this asset class.

(We recognize that using a property indicator like the NCREIF to estimate a REIT return involves an inherent mismatch. In the short run, REITs correlate much more closely with stock indexes than they do with returns on real property indicators, since measuring returns on real estate is hampered by frictions long turnover times, the stickiness of appraisals, the heterogeneity of properties, and high transactions costs. In addition, leverage tends to magnify the risk and return of REITs relative to direct real estate portfolios— as is reflected by our estimates above. Nonetheless, over long holding periods, the correlation between

REITs and real estate increases, so that "the return characteristics of REIT holdings of several years are very likely to resemble those of real estate markets where the companies are active"; see Morawski, *et al.*, 2008). Armed with these inputs, we now describe how we approach mean-variance optimization, which we will use later to compare with our four-moment portfolios.

METHODOLOGY AND RESULTS

To assess the potential for our experience assets to benefit our portfolio, we look first at traditional mean-variance optimization, then expand our portfolio measurement criteria using polynomial goal programming.

Mean-Variance Portfolios Using MMULT

Using our forward-looking inputs, we used Excel's MMULT function to determine the efficient set. While many pedagogical expositions of portfolio management recommend using Excel's Solver estimator (e.g., Sharpe, *et al.*, 2014; Carter, *et al.*, 2002), undergraduate students can easily handle the precise and flexible matrix multiplication approach explained in Arnold (2002). (Solver from versions of Excel before 2016 may also give incorrect weights; see Livingston, 2013, and Winston, 2016.)

First, we find the global minimum-variance portfolio (GMVP) using MMULT with no return constraint. The GMVP has short positions in coins (-1%) and REITS (-6%), and—given the loans' relatively small variance—puts over half into P2P (54%). International stocks, the S&P500, and small-cap value make up 15%, 29%, and 9%, respectively. The expected return for this portfolio is 0.8%/month, with a standard deviation of 0.71%/month.

With the GMVP as our starting point, we now add a return constraint to trace out the efficient frontier. MMULT makes it easy to find these efficient portfolios: once the matrix system is set up, all a student has to do is change the expected portfolio return to generate the efficient weighting scheme. Using return targets between 0.8% (the GMVP) and 2% (the mean of our highest-yielding asset, coins), we find a set of efficient portfolios whose standard deviations range from 0.71% to 1.65%/month. REITS are always sold short, and the P2P portfolio—so heavily emphasized at the low-return levels—gets negative weights in the highest-return portfolios. The allocation to coins rises steadily with return, but never tops 8%; the allocation to the three ETFs also rises, with the S&P500 ETF being assigned weights greater than 50% in almost half of the portfolios. (Not surprisingly, this ETF has the highest Sharpe ratio of all of our assets.) The weights in the highest-return portfolio (the 2% portfolio) are -28% P2P, -27% REIT, 8% coins, 56% international stocks, 66% S&P500, and 24% small-cap value.

Corner Portfolios: Sign-constrained Optimization

Once students have found the efficient frontier, they can better appreciate the efficiency losses that attend sign-constrained optimization. Since our portfolio is long-only, we are restricted to nonnegative weights in our asset classes. Thus, we will adjust the efficient frontier, starting by finding the corner portfolios. Corner portfolios define the no-shorting efficient frontier: as we move from one corner to another, assets either enter the portfolio from a zero weight, or they exit entirely. Once the corners are identified, portfolios whose returns fall between the returns of adjacent corners can be found through simple linear interpolation.

(Corner portfolios are not covered in traditional undergraduate finance texts. However, Level III of the CFA curriculum highlights the use of corner portfolios, and gives numerous examples of their application to both individual and institutional asset allocation: see Sharpe, *et al.*, 2014. For more background, Chen and Plemmons, 2007, provide a description of the basic approach to actively solving nonnegative least squares problems. Finally, Markowitz, 1952, Figure 3, offers a visual representation of the process for a three-asset portfolio; I always go over this figure with my undergraduate investments students.)

To find the corner portfolios, we start with the unconstrained global minimum-variance portfolio (GMVP). Since our GMVP assigns negative weights to coins and REITs, those asset classes are then constrained to have zero weight, and the portfolio is optimized over the rest of the asset classes. The result is the constrained minimum-variance portfolio, which will be one of the corners—the corner with the lowest expected return and variance. Since the corner with the highest expected return and variance will be simply 100% invested in the highest-mean asset class, we now have the two outside corners. Any others must lie within the return/risk range defined by these extremes.

Students can find many other corners using the unconstrained efficient portfolios as a guide. Since a corner portfolio is defined by the expected return level at which an asset's weight changes from zero to positive (or vice versa), we focus on those assets assigned both positive and negative weights along the unconstrained efficient frontier. First, students should plot the weights from the unconstrained frontier, noting at what approximate expected return level an asset's weight crosses over from positive to negative. (They should omit assets whose unconstrained weights are always negative.) Next, handling each potential corner-asset one at a time, they can set up an optimization in MMULT—not constraining the weight in the target asset—then use Goal Seek to find the portfolio expected return level at which the optimized weight in that asset is zero. Assuming that this portfolio return is near the crossover return indicated by the unconstrained efficient frontier graph, the portfolio identified by Goal Seek is likely to be a corner.

(Not all corners can be found this way. For example, sometimes an asset will enter the constrained efficient set for a very short return interval, or assets leave the constrained set but not the unconstrained. For example, in Sharpe, *et al.*'s [2014] first optimization, international bonds enter in corner portfolio 4 and exit in corner portfolio 5, while they do not exit again in the unconstrained optimization. Following the procedure described above changes the portfolio expected returns and standard deviations in this example in the affected interval by only a few basis points. Finally, it is also possible to use the improved Solver in Excel 2016 to find corners, since it allows weights to be constrained to be nonnegative; see Winston, 2016. We nonetheless prefer to use the MMULT method with students, since it is less opaque.)

The corner portfolios for our monthly data are plotted in Figure 1. International and small-cap value stocks are in all but the highest-return corner, which is 100% coins (the highest expected-return asset). Coins are not in the constrained minimum-variance portfolio or the next corner; peer-to-peer loans are only in the minimum-variance portfolio. REITs are omitted entirely. (Blanchett and Straehl's 2015 optimizations also allocate 0% to REITs in every case. Their portfolios are designed to incorporate industry-specific human capital, which the authors assert to have "relatively high" correlations with REITs.)
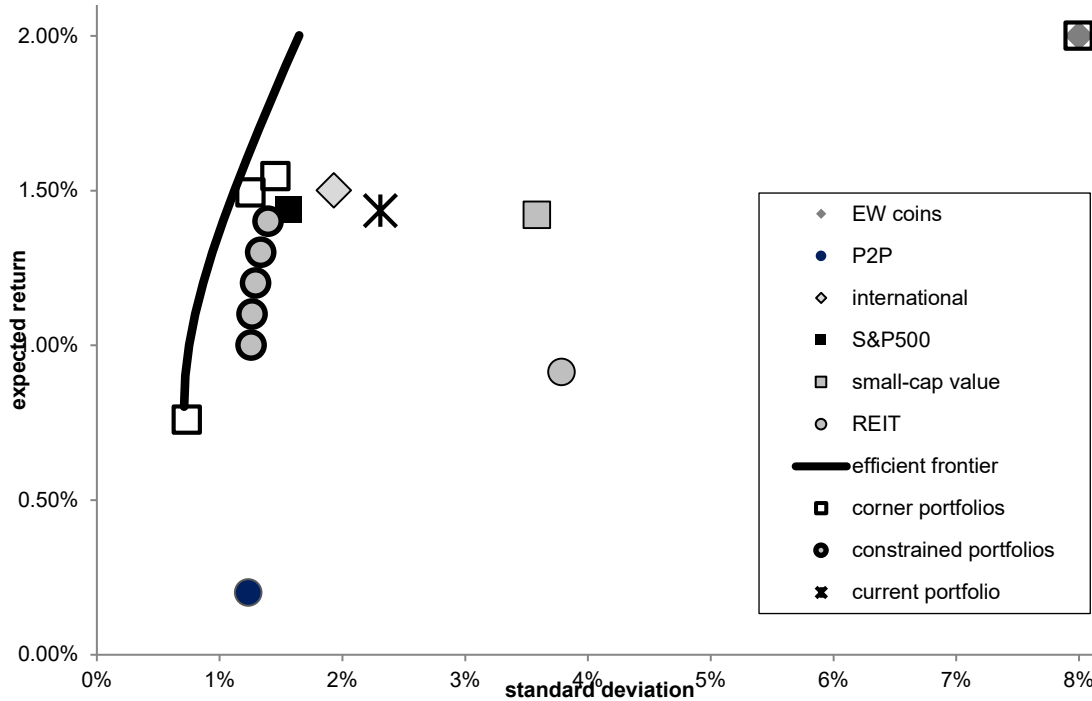
Weight-constrained Optimization

Given the optimizer's relative dislike for "experience" assets—math-based currency, P2P loans, and REITs—and its love for the S&P500, we reran the optimization constraining coins to be 15% (a recognition of reality, given the size of our coin endowment), REITs to be 5% (a minimum for reasonable experience), and the S&P500 ETF to be 10% (the maximum we are willing to commit). This resulted in positive weights for all portfolio assets for expected returns between 1.0% and 1.4%/month. For this weight-constrained set, as return rises, the P2P allocation falls from 40% to 9%; international equity rises strongly from 5% to 37%; and small-cap value rises slightly from 25% to 32%. These portfolios are also plotted in Figure 1.

Portfolios including math-based currency and REITs are clearly dominated in a mean-variance framework. However, they have definite benefits when we broaden the portfolio evaluation criteria to include skewness and kurtosis. For each corner and weight-constrained portfolio, we used the optimized weighting scheme to create a portfolio that we tracked using our 12 months' of data (October, 2016 through September, 2017). (Of course, we would have preferred to test our portfolios using out-of-sample data, but such data is not available. Remember, though, that the optimized weighting schemes were created using <u>adjusted</u> data based

on this historical period—not on the pure historical data itself.) Figure 2 plots the weights in the corner portfolios (bars in left-hand section of figure) and in the weight-constrained portfolios (right-hand side), as well as the skewness and excess kurtosis of each set (circles and triangles, respectively, plotted using the right-hand axis). All of the corner portfolios have negative skewness and are strongly leptokurtic. On the other hand, the portfolios that include math-based currency and REITs are positively skewed and essentially mesokurtic—dominating the corners along these dimensions. (This includes our current portfolio, whose skewness is 1.05 and whose excess kurtosis is 0.15.)

Figure 1: Portfolio Assets, Efficient Portfolios, Corners, and Asset-Constrained Portfolios

This figure illustrates the relationships among the various portfolio sets in mean-variance space. All assets and constrained portfolios are obviously dominated by the efficient frontier. Our weight-constrained portfolios—which fix the weights of coins, REITS, and the S&P, and which are shown as circles with heavy borders—are also dominated by the corner portfolios (the optimal long-only portfolios, shown as white squares). However, our weight-constrained portfolios offer a trade-off with their superior skewness and kurtosis, as will be shown below; our optimum portfolio—considering all four moments—may well lie below the pictured frontier (see Davies, et al., 2004).

Figure 2 demonstrates that our experience assets are valuable when we examine portfolio features beyond mean and variance. In the next section, we explore this potential by running a different type of optimization meant to incorporate higher moments: polynomial goal programming.

Mean-Variance-Skewness-Kurtosis Portfolios Using Polynomial Goal Programming

Incorporating skewness and kurtosis into an asset allocation means confronting "a nonconvex and nonsmooth multiobjective optimization problem" (Kemalbay, *et al.*, 2011). One way to handle this problem, while incorporating an investor's preferences over the first four moments, is to use polynomial goal programming (PGP). To implement this approach, we minimize the following objective function:

$$Z = \left|\frac{d_1}{R*}\right|^{\lambda_1} + \left|\frac{d_2}{V*}\right|^{\lambda_2} + \left|\frac{d_3}{S*}\right|^{\lambda_3} + \left|\frac{d_4}{K*}\right|^{\lambda_4}.$$

Here, R*, V*, S*, and K* are the "aspired" levels for mean, variance, skewness, and kurtosis, respectively, given the structure of the capital market expectations. Thus, V* is the lowest level of variance possible (from the global minimum-variance portfolio); S* is the maximum possible skewness; K* is the minimum possible kurtosis. R* is the maximum possible mean return; restricting the analysis to nonnegative weights makes this an operational concept (and implies that the max-mean portfolio will plunge into the highest-mean asset, unless weights are restricted). The first step in the PGP process is to find these aspired values. (See Lai, *et al.*, 2006, for an overview of this procedure, and Kleniati, 2004, for an overview of its development; see Massett and Henderson, 2010, for an application of PGP to the wine market and Davies, *et al.*, 2004, for an application to hedge funds.)

Figure 2. Skewness and Kurtosis of Corner and Weight-Constrained Portfolios
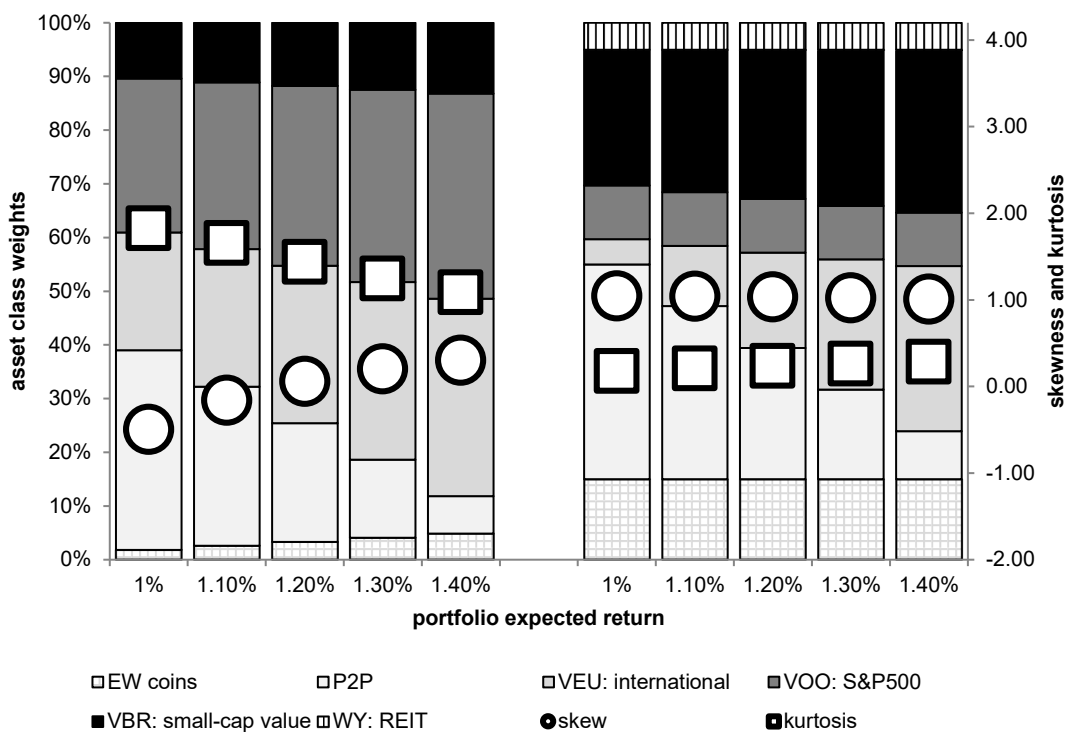
This figure plots the weights (bars), skewness (circles), and kurtosis (triangles) of the corner and weight-constrained portfolios. Corners are on the left-hand side of the figure; weight-constrained portfolios on the right. The corners, which do not include REITs or math-based currency, are all negatively skewed and leptokurtic. The weight-constrained portfolios, on the other hand, are positively skewed and essentially mesokurtic, which investors prefer.

Once the market opportunities are characterized, we add representations of the investor's preferences. These are the λ values: λ_1 reflects the investor's preference for the first moment, mean; λ_2 reflects variance; λ_3, skew; and λ_4, kurtosis. Preferences guiding portfolio creation are therefore described as $(\lambda_1, \lambda_2, \lambda_3, \lambda_4)$; for example, (1100) is the traditional mean-variance portfolio, while (1110) adds skewness as a criterion and (1111) adds both skewness and kurtosis. An investor with a stronger preference for a particular moment will tend to see more attractive values for that moment in her optimized portfolio (Davies *et al.*, 2004).

The PGP optimization proceeds by choosing the *d* terms to minimize the objective function. These *d* terms measure the distance between the portfolio's moment and the optimal level of that moment. Thus, d_1 represents the amount by which the portfolio's mean falls below M*: $d_1 = $ (M* - portfolio mean), and d_3 measures the difference in skew: $d_3 = $ (S* - portfolio skew). The d_2 and d_4 values measure portfolio distances from V* and K*, respectively, defined by subtracting the aspired values (which will be smaller) from the portfolio values. (Thus, *d* values are defined to be positive.) The absolute value functions correct

for possible negative values of M* and S*. (For our optimizations, M* and S* are positive, so we can ignore the absolute values; we therefore optimize using Excel Solver's GRG Nonlinear/Multistart engine rather than its Evolutionary engine. See Winston, 2016.)

The results of the initial PGP tests are shown in Table 3. In the top third of the table, the weights were unrestricted (except for the max-mean portfolio, which did not converge; it was restricted to positive weights); in the middle, only nonnegative weights were allowed; at the bottom, coins were set at 15% and REITS at 5%. For each of these three schemes, we give summary statistics, the value of the objective function (Z), and the optimal weights for each of the twelve λ_i preference sets used by Kemalbay, *et al.* (2011). We have roughly grouped these preference sets by the moment they highlight. We will focus primarily on the first three sets: the traditional mean-variance portfolio (whose λ_i values are 1100), the portfolio that adds skew as an equally important criterion (1110), and the portfolio that adds both skewness and kurtosis (1111).

The light grey cells in the table highlight the weights that are less than 5% in absolute value; most of these are zero. (Not surprisingly, the greatest variation occurs when the weights are unrestricted.) No portfolio, under any of the three allowed weighting schemes, uses all six assets.

We can get a sense of what the optimizer "likes" by looking at the unrestricted weight sets at the top of Table 3. Coins are essentially ignored throughout. REITS are sold short—by up to 15%—in all but two portfolios (low-variance portfolios, in which they are simply ignored). REIT weights are lowest in portfolios emphasizing skewness and kurtosis. Small-cap value is similarly deemphasized, being sold short up to 15%; its highest weight—7%—is in the traditional mean-variance portfolio. P2P loans are allocated about half the assets across the board, a reflection of its variance-reduction contributions (from its own low variance and its plethora of negative correlations). The S&P makes up the majority of what is left, along with a 10-20% allocation to international stocks. We consider these results merely indicative, however; most PGP portfolio applications do not permit negative weights (see, for example, Lai, *et al.*, 2006 and Kleniati, 2004). Thus, the sign-constrained portfolios in the middle of Table 3 are a more meaningful baseline.

When we restrict weights to be nonnegative, the biggest changes occur—not surprisingly—in the asset classes which were most often sold short. However, small-cap value (SCV) and REITs change differently: while SCV is now generally omitted where once it was sold short, REITs are now given meaningful positive weights—about 11%—in half of its previously negative-weight portfolios, including our benchmark (1110) and (1111) portfolios. Thus, considering higher moments results in higher weights for REITs, relative to the mean-variance portfolio. Our other experience assets, P2P and coins, on the other hand, have changed little: coins are still ignored, and P2P is still emphasized (albeit even more so: its weights now range from 55% to 71%, with the minimum weight in the mean-variance portfolio).

Things change dramatically when we fix the weights of coins and REITs. Now, the S&P disappears, replaced with a heavy weight in small-cap value. This SCV weight is lowest when the portfolio makes low variance a priority, but is still a minimum of 33%; it is highest in the mean-variance portfolio, at fully 80%. International, on the other hand, is most heavily weighted when variance is highlighted. P2P disappears in half of the cases, but still contributes in the mean-focused portfolios.

Figure 3 summarizes the weighting schemes just discussed, focusing on the mean-variance, 1110, and 1111 portfolios. These three portfolios are shown for the no restrictions case (left-hand side of Figure 3), nonnegative weights case (middle of figure), and restricted-weights case (right-hand side).

Table 3: Polynomial Goal Programming Portfolio Weights

				MEAN OF HIGHEST IMPORTANCE					VARIANCE OF HIGHEST IMPORTANCE			
	Mean-Var	Add Skew	All Equal	Add Skew		Max Kurt	Max Skew		Max Kurt	Max Skew	Max Kurt	Max Skew
KOF (2011):	J	K	L	A	B	H	C	D	F	I	E	G
λ_1	1	1	1	3	3	3	3	1	1	2	1	1
λ_2	1	1	1	1	1	1	1	3	3	3	1	2
λ_3	0	1	1	1	2	2	3	1	1	3	1	3
λ_4	0	0	1	0	1	3	1	1	3	1	3	2
UN-CONSTRAINED												
mean (%)	0.39	0.34	0.05	0.36	0.06	0.38	0.44	-0.10	0.27	-0.07	0.31	0.43
variance (E-05)	4.93	5.74	5.67	5.76	5.86	6.01	6.51	6.56	6.59	6.78	5.50	6.61
skew	-0.74	0.33	-0.09	0.34	0.09	0.43	0.37	0.07	0.51	0.26	0.15	0.53
kurtosis	3.18	3.42	2.36	3.44	2.49	3.33	2.62	2.20	3.07	2.45	3.05	3.08
objective	2.99	3.05	2.11	3.03	2.11	1.96	2.00	1.89	1.87	1.79	2.07	1.72
EW COINS	**0.00**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**	**-0.01**
P2P	0.54	0.50	0.59	0.49	0.57	0.48	0.47	0.62	0.49	0.59	0.51	0.46
INT'L	0.15	0.20	0.12	0.20	0.10	0.17	0.07	0.11	**0.04**	0.08	0.16	0.13
S&P	0.31	0.42	0.31	0.42	0.41	0.52	0.70	0.29	0.71	0.43	0.45	0.64
SCV	0.07	**0.03**	**0.00**	**0.03**	**-0.04**	**-0.02**	-0.11	**-0.01**	-0.15	-0.08	**-0.01**	-0.07
REIT	-0.06	-0.13	**-0.02**	-0.13	**-0.03**	-0.14	-0.12	**0.01**	-0.07	**0.00**	-0.10	-0.15
SIGN-CONSTRAINED												
mean (%)	0.44	0.26	0.08	0.27	0.71	0.76	0.80	0.08	0.15	0.70	0.16	0.73
variance (E-05)	5.41	7.59	8.52	7.55	10.5	10.7	12.3	8.54	8.33	9.87	8.01	10.3
skew	-1.02	0.04	-0.04	0.03	-0.12	-0.09	0.03	-0.03	0.13	-0.18	0.08	-0.13
kurtosis	3.90	4.13	2.70	4.18	3.25	3.39	3.35	2.70	3.45	3.30	3.48	3.35
objective	2.99	3.36	2.67	3.34	3.40	3.12	3.43	2.29	2.08	3.39	2.46	3.30
EW COINS	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**	**0.01**
P2P	0.55	0.61	0.71	0.61	0.59	0.58	0.59	0.71	0.67	0.59	0.66	0.58
INT'L	0.13	**0.00**	0.08	**0.00**	0.04	0.03	0.03	0.08	**0.00**	0.04	**0.00**	0.03
S&P	0.23	0.28	**0.00**	0.29	0.35	0.38	0.37	**0.00**	0.21	0.37	0.22	0.37
SCV	0.09	**0.00**	0.08	**0.00**	**0.00**	**0.00**	**0.00**	0.08	**0.00**	**0.00**	**0.00**	**0.00**
REIT	**0.00**	0.10	0.12	0.10	**0.00**	**0.00**	**0.00**	0.13	0.12	**0.00**	0.11	**0.00**
CONSTRAINED WEIGHTS												
mean (%)	6.18	6.20	5.95	5.60	5.91	5.88	6.06	6.21	6.21	5.80	6.20	6.19
variance (E-03)	3.50	4.05	3.97	4.06	3.71	3.74	3.58	4.59	4.53	3.82	4.05	3.85
skew	0.59	0.91	0.92	0.96	0.80	0.82	0.68	1.00	0.99	0.86	0.91	0.83
kurtosis	4.11	4.36	4.29	4.21	4.18	4.19	4.15	4.33	4.34	4.20	4.36	4.33
objective	2.01	1.30	0.37	1.25	0.15	0.12	0.09	0.16	0.09	0.04	0.30	0.03
EW COINS	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	
P2P	**0.00**	**0.00**	0.13	0.32	0.15	0.16	0.06	**0.00**	**0.00**	0.21	**0.00**	**0.00**
INT'L	**0.00**	0.28	0.14	**0.00**	**0.00**	**0.00**	**0.00**	0.47	0.45	**0.00**	0.28	0.20
S&P	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
SCV	0.80	0.52	0.53	0.48	0.65	0.64	0.74	0.33	0.35	0.59	0.52	0.60
REIT	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**

This table presents the results of the polynomial goal programming optimization. Each column represents a different set of investor preferences, described by the λ values at the top of the column. λ_i refers to the investor's preferences over the ith moment: e.g., λ_3 represents her preference for portfolio skewness. Larger λ values imply more importance. (The lettered labels for the λ sets refer to Kemalbay, et. al.'s [2011] sets, for comparison. These are comparable to the sets used in Lai, et al., 2006. In contrast, Davies, et al., 2004, set a unit variance, then restrict the kurtosis parameter to fall between 0 and 1.) In the top third of the table, the weights are unconstrained; in the middle third, they are constrained to be nonnegative; in the bottom third, the weight of coins was set at 15% and the weight of REITs at 5% (as highlighted by the dark cells). The light grey cells throughout the table highlight weights close to zero—assets essentially ignored in specific portfolios. Note that the kurtosis values are <u>not</u> excess kurtosis.

Having considered the portfolio weights, we now review their expected performance statistics. To begin, we note that the unrestricted weighting scheme has the most favorable target moments (highest M* and S*, and lowest V* and K*); the restricted-weight scheme has the least favorable. For both the unconstrained and nonnegative-weights schemes, the mean-variance portfolio (1100) has the highest mean and lowest variance; (1110), which adds skewness, has the highest skew, while (1111) has the lowest kurtosis. (For the constrained-weight scheme, mean is highest for (1110), skewness is highest for (1111), and kurtosis is lowest for the mean-variance portfolio; these deviations from the expected outcomes are not material, however.) For all weighting schemes, the mean-variance portfolio has the lowest skew, justifying the point quoted in Davies, *et al.* (2004) that "mean-variance optimisers may be nothing more than skewness minimizers."

What is meaningfully different about the constrained-weights case is the magnitude of the portfolios' means and variances. Requiring a 15% allocation to coins—an asset ignored in almost all other portfolios—makes both means and variances magnitudes higher for these portfolios. We also observe that the variation in parameter values is much smaller when weights are constrained, which is consistent with Davies, *et al.*'s (2004) findings. Perhaps more interestingly, the skewness values for the restricted portfolios are all positive, and are all many times larger than their non-negative counterparts'. We see clearly the trade-off required when incorporating our experience assets into our portfolio: we incur greater risk (much higher variance and slightly higher kurtosis) in exchange for higher expected return and much higher skew.

Figure 3: Weighting Sets for PGP Optimization
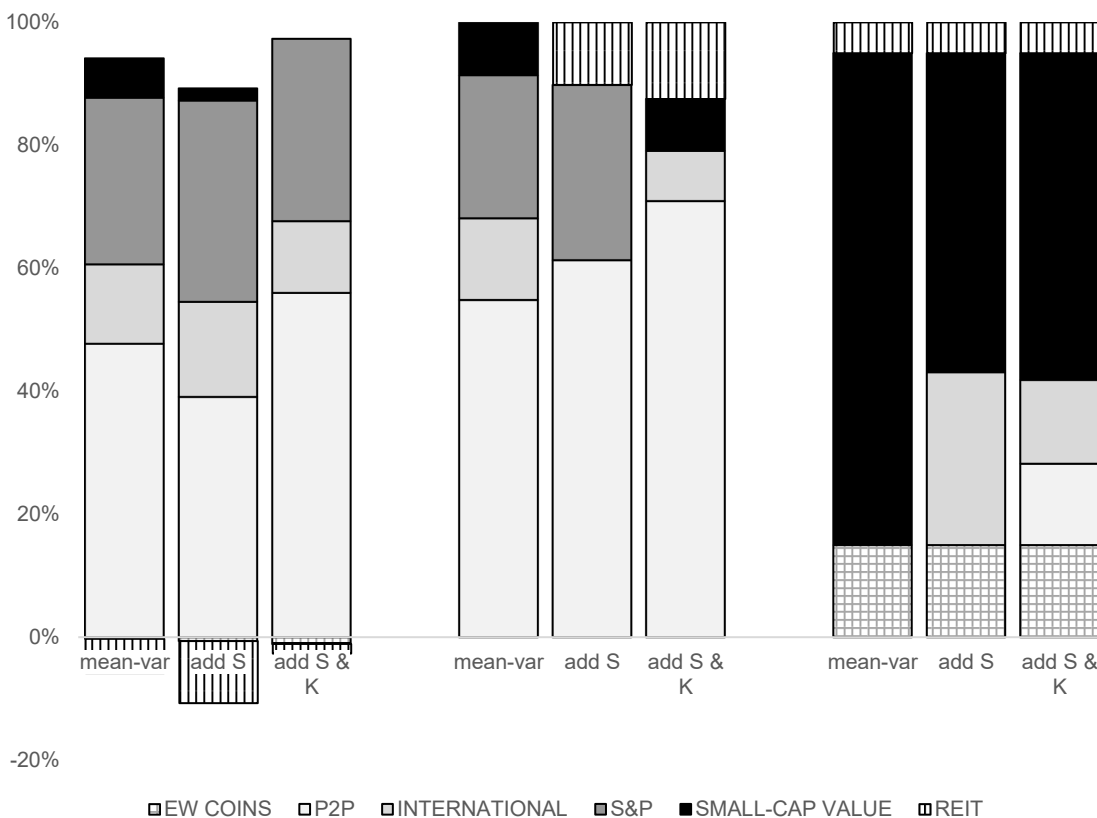
The figure shows the weights derived from polynomial goal programming, given no weight restrictions (left-hand side), nonnegative weights (middle), and constrained weights (right-hand side). For each weighting scheme, we show weights for three preference sets (λᵢ choices): mean-variance (first bar), mean/variance/skew (second bar), and mean/variance/skew/kurtosis (third bar). Results are mixed for our three "experience" assets. Coins are ignored in the unconstrained and nonnegative-weight cases, while P2P loans are emphasized. REITS are sold short in the unconstrained cases, but are added in the nonnegative weight cases that include skewness and kurtosis.

Bootstrapping

For additional insight into our results, we repeated the PGP sign-constrained and weight-restricted optimizations using bootstrapped data. (These results are not tabulated, but are available from the authors upon request.) We first compressed and shifted the coin returns to achieve a 2% monthly mean and 8% monthly standard deviation, consistent with our forward-looking assumptions, then generated 1,000 draws. These draws became the inputs for the PGP routine.

In the sign-constrained optimization, (1110) and (1111) contain only the S&P, international equity, and P2P loans, with the latter having a supermajority weight in both cases. The mean-variance portfolio adds a sliver of coins and a 6% allocation to small-cap value. In contrast, the restricted weight mean-variance, (1110), and (1111) portfolios all include all six assets, with P2P being much more important in the latter two (weights of 41% for the skewness portfolio and 35% in the skew/kurtosis, compared to 3% in the mean-variance portfolio). Of perhaps more interest are the comparisons among the bootstrapped portfolios and those in Figure 3. Focusing on the restricted-weight cases, we see much less small-cap value in the bootstrapped portfolios, and less international and more P2P in the (1110) and (1111) portfolios. Overall, we interpret these results as mitigating the highly concentrated allocations from the initial PGP results from Figure 3, and suggesting a meaningful portfolio roles for P2P, given our commitment to our other "experience" assets.

CONCLUSIONS

Most universities sponsor student-managed funds, and most of these funds are long-only equity. However, there is a lot more to portfolio management than picking stocks, and there are many who argue (including us) that equity funds of just a few hundred thousand dollars are best managed when allocated completely to mutual funds. Nonetheless, students (and many other investors) can be seduced by the behavioral biases (e.g., overconfidence, illusion of control) that attend picking stocks.

Our fund is different. It is very small, and it is independent of our university. We incorporated in in 2009, as the peer-to-peer loan market was beginning; using microloans in the P2P market allowed us to form a debt-focused fund (highly unusual in itself) using unique assets. Adding additional asset classes—like REITs and math-based currencies—has given our students the opportunity to explore concepts of diversification, portfolio development, and asset allocation that cannot be studied in a traditional long-only equity fund.

In this paper, we describe our asset allocation process. We begin with traditional mean-variance analysis. Not surprisingly, our current portfolio is not on the efficient frontier. We identify various "corner portfolios"—whose weights are constrained to be nonnegative—and find that our "experience assets" are not well represented: coins are only in the higher-return corners; P2P loans are only in the lowest; REITs are ignored completely. Nonetheless, we find that these assets do find more prominent places when we broaden the criteria by considering skewness and kurtosis. The math-based currency is more skewed than the market, and is strongly negatively coskewed with it (a useful feature, since market returns are usually negatively skewed). The MBCs and the P2P loans are also generally negatively correlated with the stock ETFs. These features manifest themselves in higher skewness and lower kurtosis on our weight-constrained optimizations. Thus, asset classes that look unattractive using traditional two-moment optimization reveal useful characteristics when the scope is broadened.

We are not exclusively, or even primarily, concerned with portfolio performance, however; as a teaching portfolio, we have the luxury of also being able to consider the educational opportunities offered by our asset classes. Incorporating unusual assets like math-based currencies and peer-to-peer loans allows our students to explore Excel's MMULT, Solver, and GoalSeek capabilities in the context of mean-variance

optimization. Exploring those assets' potential also allows us to apply more novel techniques like polynomial goal programming to evaluate the higher portfolio moments of skewness and kurtosis.

Introducing students to these techniques will better prepare them for the increasingly quantitative nature of portfolio management. The assets we incorporate and the methods we employ are not relevant only to student-managed funds; our couching of our process within the SMF literature simply reflects our own experience. The process, however, can be applied to real-world funds as well.

Our SMF is unique in assets, form, and mission. By moving beyond stock picking, we prepare our students to make immediate, meaningful contributions to a broader array of financial organizations. Any university can duplicate our approach: a tiny amount of money, coupled with motivated students, is all that is required.

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ABSTRACT

This study documents the creation, structure, and performance of a Student Managed Investment Fund (SMIF) carved out of a Jesuit Liberal Arts University's endowment funds. With more Universities looking to incorporate SMIFs into their curriculum, or to provide an experiential learning opportunity to their students, this paper details what we have learned from our experience with the Sellinger Applied Portfolio fund. This paper will be helpful to those looking to start a SMIF, and details the risks involved with the same. To mitigate these risks, we offer a structure that has worked for us, and details on the oversight process followed by the University. This fund is a part of the University endowment, so Universities that are looking to follow this path will find our paper helpful. We also describe in detail how to set this up as a for-credit class, and part of the curriculum. The choice of financial datasets to aid in research, challenges faced by the students, and faculty are also documented. A properly structured SMIF is a boon to a University and can maximize the student experience, while also keeping faculty, the administration, trustees, and alumni engaged. The intent of this paper is to serve as a guide and help move the process along.

JEL: A2

KEYWORDS: Student–Managed Investment Fund

INTRODUCTION

Traditionally, college-level Investments courses were taught primarily based on investment and portfolio theory with popular textbooks such as the "Investments" or "Essentials of Investments" by Professors Zvi Bodie, Alex Kane, and Alan Marcus. The early 1990s ushered in an advancement in Investments education with the advent of investing simulations like Stock-Trak where students could create hypothetical portfolios with large sums of fictional money and invest in a range of assets based on the professor's directives and constraints. Altmyer (2000) discusses how Stock-Trak has benefited professors and various student groups with respect to learning about the stock market and investing in general.

After investing simulations became increasingly popular and faculty and students sought the next development in investments education, the ensuing evolution in investments education was the transition from the hypothetical to reality and commit actual dollars to investments. Student managed investment funds (SMIFs) have provided an experiential learning opportunity for students globally ever since they began being offered at colleges and universities – both as courses for degree credit and as a part of university sponsored clubs. Very little research and guidance has been written identifying best practices and considerations when structuring a SMIF at a university. This is the aim of our paper.

Charlton et al. (2015) provide a good discussion and survey of the literature regarding the benefits of SMIFs as a form of experiential learning. Lawrence (2008) documents the hundreds of SMIFs across the world as well the millions of dollars students have the opportunity to manage via their respective universities. It

should be noted that in addition to colleges and universities, high schools and other student groups have adopted SMIF frameworks. McInerny (2003) discusses the usage of SMIFs at high schools for readers interested in the implementation of SMIFs at a learning level earlier than college.

Given the increasing opportunities for students to experience asset management as well as the attention being paid by researchers with more and more research being undertaken on the topic, this paper seeks to contribute to the literature by presenting one Jesuit University's findings, approaches, and overall best practices given the unique organizational form of a religious University. Loyola University Maryland is a Jesuit Catholic university located in Baltimore, Maryland. A decision to create a SMIF at Loyola was made in 2006. Unlike funds that other universities may have, Loyola's SMIF fund – the Sellinger Applied Portfolio (SAP) Fund – was not started with a donation, but rather an allocated portion of the University's endowment. As such, the fund is governed by the investing guidelines of the University's endowment. And given the religious affiliation of the University, the SAP fund must be managed in such a way that is consistent with the doctrines and teachings of the Catholic Church. This makes the SAP fund a unique study as to how universities can implement and operate a SMIF within the purview of the usual stakeholders (e.g., alumni, University administration, trustees, etc.) subject to the University's endowment investment restrictions, as well as provide a framework for how students identify potential investments that are consistent with the overall University's mission.

For a University looking to start a SMIF, the process can be daunting. Our contribution to the SMIF literature, through this paper is, to lay out the process for setting up the fund from a portion of the University's endowment. We also provide guidance on the additional oversight required through this process and how that is managed, how to structure the fund as a for-credit class to maximize student learning while also being mindful of ensuring that the students decisions are monitored and vetted. We provide faculty who may be chosen to teach the class an understanding of how to help students develop their research, presentation, debate, and report writing skills. We also provide guidance on the use of datasets used in conjunction with SMIFs. We also provide background on the evolution of the structure and management of the fund since 2006, and how the process was refined to maximize student learning.

LITERATURE REVIEW

Lawrence (1994) is credited with providing one of the early seminal studies on SMIFs and their usage in learning. Since then numerous other studies have come out ranging from how a regional school can get a SMIF started (Macy (2010)) to potential challenges and benefits of SMIFs at metropolitan universities (Kahl (1997)). As previously mentioned, Lawrence (2008) provides a thorough and comprehensive international survey of the state of SMIFs in higher education. Ammermann et al. (2011) provide an asset–allocation and security–selection framework for SMIFs so that faculty running SMIFs have a resource for getting started with quantitative approaches. Bowers and Lavin (2012) also provide modeling and valuation guidance for SMIF students. Neumann (2017) provides cash flow valuation guidance for use in SMIFs using widely taught equity valuation models such as the dividend discount model.

Clinebell (2013) shows how SMIFs can be used as an opportunity to teach socially responsible investing (SRI). Given Loyola's religious affiliation, students are made aware of potential investments that may contradict the University's beliefs. Thus, Loyola's SMIF incorporates elements of SRI that Clinebell (2013) discusses. Livingston and Glassman (2009) discuss how alternative types of investments (e.g., peer to peer loan portfolios) can also be incorporated into a SMIF structure. Livingston (2017) discusses the unique risk factors associated with peer to peer investing using data from a SMIF. Clinebell and Murphy (2016) document the benefits of SMIFs and becoming familiar with popular databases from the perspective of alumni. They report that participating in a SMIF while a student in college is beneficial in their careers after college. Livingston, Glassman, and Wright (2011) outline how SMIFs can be incorporated into community service activities, benefiting students during and after their college experience.

BACKGROUND OF LOYOLA'S SMIF

The original allocation for Loyola's SMIF in 2006 was for $500,000, which came from the University's endowment. The fund was typically reset to the original amount at the start of a new academic year, although the fund could run for additional years without being reset. Management of the fund from 2006 until 2010 was only assigned to graduate students – typically Master of Science in Finance (MSF) students. The number of students selected to manage the fund was between five and ten and they were required to manage the fund for the entire year (as a three credit course). Before enrolling in this course, the students were required to have successfully completed the required Investments course in the MSF program.

Upon initial implementation, the SMIF's allowable investments that students could select from were U.S. exchange listed stocks as well as investment grade fixed income securities. The portfolio was designed as a long-only portfolio and its performance was indexed to the S&P 500 index. The course was initially assigned to a tenured faculty member, but Loyola also tried using an investment professional for a while. This did not seem to work well though, especially given the time commitment needed and given that this was a three credit course. In the year 2011, it was reassigned to a faculty mentor who was tasked with working with the University's Assistant Vice President for Finance and the Director of Treasury to streamline the guidelines for the fund as well as to see if the University could allow undergraduate students to participate in this experiential learning experience.

This was important because the undergraduate program at Loyola University Maryland is larger than the graduate program. It was also important because the University was making a transition from a Liberal Arts college to a comprehensive regional University. The resources assigned to the business school were significantly increased at this point including a dedicated Finance lab that housed terminals for popular finance databases and resources such as Bloomberg, S&P Capital IQ, and Morningstar. Before acquiring access to such popular databases, students in the past were only able to perform research on investments – current and prospective – using freely available data sources (e.g., Yahoo Finance). But with the new learning resources, Loyola was able to give students the tools needed for investment research that also helped prepare them for careers in finance.

Given the enormous time and responsibility placed on a few students in the earlier version of the SMIF course, a decision was made to have the fund managed by undergraduate students in the fall and spring and graduate students in the summer. This has worked really well and currently, undergraduate students are given an experiential learning opportunity that they did not have before. All students must apply to enroll in the SMIF course. The selection process is rigorous, with students needing to submit a resume, an essay detailing how they feel they would benefit from the experience of managing the fund, and relevant experience via prior coursework and internships that would ensure that they would be able to contribute through their participation in the management of the fund. Interviews are also part of the process.

Admission to the course is capped at 20 students a semester and currently, these are all seniors. The selection process is conducted in the spring semester for all rising seniors, and at this time, selections are made to fill both the fall and spring sections for the next academic year. One three credit section of this course with 20 students is offered in the Fall semester and another is offered in the Spring semester. For the graduate students, Loyola allows the course to be cross-listed as an MSF/MBA program course. Given the rigor of the course (summer only), the distribution is typically 80/20, with 80% of the graduate students being MSF students and 20% of the graduate students being MBA students

Fund Structure

In 2011, guidelines were put into place to address issues that we observed after the first few years of the fund. The investment policy statement was revised with clearer goals for the administrative oversight of the

fund including more clearly defining the responsibilities of the students, fund advisor, and the University's finance office. Most of these were already in place, but the document formalized the guidelines. Examples of some include: (i) allowable investments include U.S. exchange listed stocks (including American Depositary Receipts (ADRs), unleveraged exchange traded funds (ETFs) including stock index ETFs and commodity ETFs and (ii) disapproved investments include "sin" stocks (i.e., the company offers products and/or services that can contribute to the harm of one's self or others such as cigarettes and firearms). Moral and social considerations must be considered throughout the investment process, with emphasis on the United States Conference of Catholic Bishops (USCCB) principles of socially responsible investments.

The students have complete control over the portfolio and make all decisions regarding allocation of the funds and which recommendations will be acted upon. The guidelines provided allow students to overcome their initial apprehensions and begin the investing process. Once they find potential investments that meet the screening criteria, they can then move toward shortlisting two to three securities and research these in detail.

Students are provided guidelines for conducting research into possible SMIF investments. As mentioned in the investment policy statement (IPS), the primary research databases will be the data aggregation platforms Morningstar, Capital IQ, and Bloomberg, or the platforms currently available in the Sellinger Experiential Learning Lab (SELL). Additional research sources may include, but is not limited to, company announcements, global markets and foreign exchange rates, inflation/unemployment/housing statistics, consumer confidence, etc. Fundamental analysis may include the use of ratios and valuation models, to include debt ratios, profitability ratios, market valuation ratios, liquidity ratios, etc. Technical analysis tools may include the short interest ratio, insider trading activity, moving averages, as well as puts/calls ratios etc.

Table 1 presents some of Loyola's SMIF investment guidance provided to students at the beginning of the semester. The primary investment strategy of the SMIF is to select stocks that appear to be undervalued and should outperform their industry and the S&P 500 index over the course of the investment period. Diversification across sectors is a key part of the investment strategy, although given market conditions in a period, certain sectors may be significantly under-weighted and others over-weighted with asset allocation targets provided by the professor. Written justification must be provided by the faculty moderator for the SMIF for investments more than 25% in any one sector.

Faculty Course Format Considerations

The faculty member or department chair should be involved in the crafting of guidelines for the fund to provide the academic perspective. Table 2 presents Loyola University Maryland's investment oversight and process guidelines for the SMIF. It is recommended that such processes and responsibilities be discussed and identified. Additionally, if there are certain moral/social constraints placed on investing the funds, those should be addressed in the guidelines and IPS. This allows the faculty moderator/professor, to fully understand the investing conditions and allow for the development of an appropriate syllabus. It is also important to understand that a course like this takes much more time and preparation than a regular course taught by a professor every semester. As such, it is recommended that department chairs adjust faculty schedules accordingly. It is also recommended that tenure-track faculty members who have not yet attained tenure not be assigned to teach a course like this. These faculty may not be the best mentors for a course like this if they are concerned about the fact that the fund may end up with losses during the time that they were mentors for the fund and that such losses may, in some way, affect their tenure application. The time necessary to devote to teaching a SMIF course, and the administration of the fund, could negatively impact a tenure-track faculty member's available time to devote to research in order to gain tenure.

Table 1: Fund Strategies

1	The primary investment strategy is to select stocks that are undervalued and will outperform their industry and the S&P 500 index over the course of the investment period.
2	Diversification across sectors will be a key part of the investment strategy, although given market conditions in a period, certain sectors may be significantly under-weighted and others over-weighted. Asset allocation targets include: Not more than 10% will be invested in any one stock Not more than 25% will be invested in a single index Not more than 30% will be invested in a single sector
3	There will ordinarily be three types of investment strategies within the SAP Fund: A growth investment strategy A value investment strategy A dividend strategy
4	Depending on economic conditions during a given period, the SAP Fund may be more heavily weighted towards one or two of these investment strategies. The primary objective is to work towards a mix that includes: 40% value 40% growth 20% dividend
5	Rebalancing criteria: The Fund will be monitored and periodically rebalanced to ensure that the targets as specified previously to ensure diversification will be adhered to. Rebalancing may be necessary after re-evaluating positions in securities that have significantly underperformed and/or those that have significantly over performed resulting in these securities becoming temporarily overvalued.
6	Proxy voting will agree with company recommendations.

This table presents some of Loyola University Maryland's Student Managed Investment Fund (SMIF) investment guidance provided to students at the beginning of the semester. The primary investment strategy of the SMIF is to select stocks that appear to be undervalued and should outperform their industry and the S&P 500 index over the course of the investment period. Written justification must be provided by the faculty moderator for the SMIF for investments more than 25% in any one sector.

Table 2: Investment Oversight and Process

1	Investment Committee of the Board of Trustees: Approve annual allocation to SAP Fund. Monitor performance of SAP Fund monthly as part of the University's endowment. May invite faculty and students to attend Investment Committee meetings to discuss SAP Fund.
2	Faculty: Provide oversight and direction to students. Submit buy and sell requests to AVP for Finance for approval and to Director of Investment and Treasury Services for processing. Submit semester-end reports (fall and spring), detailing Fund performance to the Finance Department Chair, AVP for Finance, and the Director of Investment and Treasury Services.
3	Students: Perform research and rebalancing within portfolio. Prepare buy and sell requests for approval by faculty.
4	Office of Business and Finance: AVP for Finance approves all buy and sell requests. Director of Investment and Treasury Services works with Investment Custodian to process all buy and sell requests. Ensure all investments within the SAP Fund are liquidated annually, if required. The SAP Fund will be monitored by undergraduate students in the fall and spring semesters and by graduate students in the summer. Ordinarily the Fund will be reset to the starting value of $500,000 in the month of August. If the value of the Fund is below $500,000 as of August 31, a cash infusion will be made to the Fund. If the current holdings in the Fund are valued more than $500,000, the graduate students in conjunction with the professor, will provide recommendations to liquidate some of the Fund's holdings to enable the amount more than $500,000 to be swept out of the account. If for any reason the SAP class is not held (fall, spring or summer sessions), the Fund will be entirely liquidated and absorbed back into the endowment. When the class does resume, the Fund will restart with $500,000 in cash.

This table presents Loyola University Maryland's Student Managed Investment Fund (SMIF) investment oversight and process guidelines. It is recommended that such processes and responsibilities be discussed and identified. Additionally, if there are certain moral/social constraints placed on investing the funds, those should be addressed in the guidelines and investment policy statement (IPS).

With regard to students who are admitted to the SMIF course, it is important to instill confidence in their ability to manage the fund. From what we have been able to observe, students tend to enter this course with

a fair amount of trepidation. This is not because they do not see themselves as qualified to manage the fund (given the selective process to gain admittance into the course), rather, it is the fear of any losses that typically results in them being overly cautious with their investment recommendations. This could take the following forms: (i) doing excellent research but recommending a very minimal investment in the security that the students are proposing to add to the fund (ii) voting against securities that most of the students are not already familiar with, perceiving these as being too risky and (iii) voting against securities that the students are familiar with because the team proposing the investment cannot answer a couple of questions that may not always be relevant. Nonetheless, the issue here is that when students begin the course, they are typically overly risk averse.

DATA AND METHODOLOGY

In Table 3, a subset of Loyola's recent fund performance across time is provided. These numbers are collated from reports received from the investment custodian for the University. Even with turnover of the fund's managers each semester, the SAP fund has not lagged the benchmark for the metric "return since inception date November 2006." As of June 30, 2018, the SMIF has generated an annualized return of 9.4%, compared to 8.3% for the S&P 500. Faculty members can obtain fund performance data from the investment custodian and asset performance against the appropriate benchmark. This allows for rich discussions in the classroom regarding which metrics should be used to assess performance (e.g., Sharpe ratios) as well as how fund benchmarks are decided upon in practice.

Table 3: Sample Student Managed Investment Fund (SMIF) and S&P 500 Performance

Fund	Month End	Year	1 Month	3 Month	1yr	3yr	5yr	Return Since Inception Nov-06
SMIF	Jan	2014	-4.6	0.1	22.5	14	12	8.8
S&P 500	Jan	2014	-3.5	2	21.5	14	19	5.9
SMIF	April	2014	0.9	6	19.1	13	14	9.4
S&P 500	April	2014	0.7	6.2	20.4	14	20	6.5
SMIF	May	2014	2.8	4	19.6	15	14	9.7
S&P 500	May	2014	2.3	4	20.4	15	18	6.8
SMIF	July	2014	-2.2	3.9	17.1	16	13	9.6
S&P 500	July	2014	-1.4	3	16.9	17	17	6.7
SMIF	August	2014	2.1	3.2	22.1	16	14	9.8
S&P 500	August	2014	4	4.7	25.2	21	17	7.2
SMIF	Sept	2014	-0.7	-0.8	17.3	16	13	9.6
S&P 500	Sept	2014	-1.4	1.1	19.7	23	16	6.9
SMIF	June	2015	-0.5	0.1	5.3	15	13	9.5
S&P 500	June	2015	-1.9	0.3	7.4	17	7.3	7
SMIF	July	2015	2.4	3.1	10.3	16	14	9.7
S&P 500	July	2015	2.1	1.4	11.2	18	16	7.2
SMIF	Sept	2015	-1.2	-10.3	-4.8	11	11	7.9
S&P 500	Sept	2015	-2.5	-6.4	-0.6	12	13	6
SMIF	Nov	2015	-2	4.5	-2.9	13	12	8.4
S&P 500	Nov	2015	0.3	6.1	2.7	16	14	6.9
SMIF	Dec	2015	-2.7	2.9	-4.4	12	11	8
S&P 500	Dec	2015	-1.6	7	1.4	15	13	6.7
SMIF	May	2015	1.2	0.8	9.4	15	13	9.6
S&P 500	May	2015	1.3	0.6	11.8	20	17	7.4
SMIF	Jan	2016	-6.8	-11.1	-9.4	7.7	8.8	7.1
S&P 500	Jan	2016	-5.5	-6.2	-0.7	11	11	6
SMIF	Feb	2016	1.2	-8.3	-13	7.8	8.2	7.2

Fund	Month End	Year	1 Month	3 Month	1yr	3yr	5yr	Return Since Inception Nov-06
S&P 500	Feb	2016	-0.1	-6.6	-6.2	11	10	5.9
SMIF	March	2016	6.5	0.4	-7.2	8.2	9.4	7.8
S&P 500	March	2016	6.8	1.3	1.8	12	12	6.6
SMIF	April	2016	1.6	9.5	-5.1	7.9	9	7.9
S&P 500	April	2016	0.4	7.1	1.2	11	11	6.6
SMIF	June	2016	-0.8	2	-5.4	8	9.4	7.8
S&P 500	June	2016	0.3	2.5	4	12	12	6.7
SMIF	July	2016	4.3	4.7	-3.6	7.6	10	8.2
S&P 500	July	2016	3.7	5.8	5.6	11	13	7.1
SMIF	August	2016	1	4.5	9.8	8.7	11	8.3
S&P 500	August	2016	0.1	4.1	12.6	12	15	7
SMIF	Sept	2016	0.6	6	11.7	7.6	11	8.3
S&P 500	Sept	2016	0	3.9	15.4	11	16	7
SMIF	Nov	2016	5.7	3.9	9.1	6	11	8.5
S&P 500	Nov	2016	3.7	1.8	8.1	9.1	14	7
SMIF	Jan	2017	2.1	8.1	23.1	7.9	11	8.6
S&P 500	Jan	2017	1.9	7.8	20	11	14	7.3
SMIF	Feb	2017	3.3	5.6	25.7	7.4	11	8.8
S&P 500	Feb	2017	4	8	25	11	14	7.7
SMIF	March	2017	-0.1	5.4	18	7.3	10	8.7
S&P 500	March	2017	0.1	6.1	17.2	10	13	7.6
SMIF	May	2017	1.5	2.8	17.9	7	11	8.9
S&P 500	May	2017	1.4	2.6	17.5	10	15	7.7
SMIF	June	2017	2.1	5.1	21.4	6.5	12	9
S&P 500	June	2017	0.6	3.1	17.9	9.6	15	7.7
SMIF	July	2017	2.3	6	19.1	8.2	12	9.2
S&P 500	July	2017	2.1	4.1	16	11	15	7.9
SMIF	Sept	2017	0.8	5.1	20.4	8.6	13	9.3
S&P 500	Sept	2017	2.1	4.5	18.6	11	14	8
SMIF	Nov	2017	0.8	4.1	20.3	8.4	14	9.5
S&P 500	Nov	2017	3.1	7.6	22.9	11	16	8.4
SMIF	Jan	2018	5.3	8.4	26.5	12	14	10
S&P 500	Jan	2018	5.7	10.2	26.4	15	16	8.9
SMIF	April	2018	1	-4.5	15.4	8.8	11	9.4
S&P 500	April	2018	0.4	-5.8	13.3	11	13	8.1
SMIF	May	2018	2.3	2.7	16.4	9.2	11	9.5
S&P 500	May	2018	2.4	0.2	14.4	11	13	8.3
SMIF	June	2018	-0.2	3.1	13.7	9.3	12	9.4
S&P 500	June	2018	0.6	3.4	14.4	12	13	8.3

This table presents a sample of recent SMIF performance across time compared to the benchmark. These numbers are collated from reports received from the investment custodian for the University. Even with turnover of the fund's managers each semester, the SMIF fund has not lagged the benchmark for the metric "return since inception date November 2006."

FUND OBJECTIVES AND ADDITIONAL OBSERVATIONS

The Loyola SAP Fund was established to provide students with actual portfolio management experience and exposure including asset valuation, constraint setting, asset allocation, asset selection, risk management, and performance evaluation. Since the SMIF is structured as a course, the professor combines lectures with presentations and applications. As previously mentioned, the SMIF course is capped at twenty students, but it has been found that it is not advisable (if possible) to have less than fifteen students and not more than twenty students. For a full semester length course, this number of students fits nicely into five groups of three to four students and allows for an optimal division of work. This also allows reasonable coverage by the students of all eleven sectors of the S&P 500.

Each team of students makes four stock recommendations and two current event presentations throughout the semester. The stock recommendations are rigorous, and students make use of popular databases such as Bloomberg, Capital IQ, and Morningstar to conduct their research. All student presentations are time bound, ensuring that students understand how professional presentations are made and also to help them parse out the most important information.

Consensus building is one of the most important skills that students develop in this course. For stock recommendation presentations, the presenting team takes questions from the class after they are finished presenting. An emphasis is placed on asking relevant questions in a manner that moves the conversation forward. All teams get a chance to discuss the recommendation amongst themselves before a vote. After the presentation, question and answer session, and subsequent team discussion, students vote individually to accept or reject a stock recommendation. The recommendation is accepted with at least 60% of the class voting in favor of the recommendation proposed.

The vote is conducted by a show of hands and students voting "no" will offer a short explanation regarding why they voted against the presentation. This ensures that the presenting team gets an explanation that helps them with future presentations and stock recommendations. It is important to conduct this step as there have been times when the ability of five groups to work together can fall apart, and teams will vote against other teams' recommendation because that team did not vote for their recommendation earlier in the semester. This is something that SMIF mentors should guard against and address. Additionally, the professor weaves in course topics through lectures and the students use this guidance toward the end of the semester to evaluate their fund performance, rebalance the fund if necessary, and prepare a comprehensive end-of-semester report that is submitted to the University's Office of Business and Finance.

SMIF Fund Allocation

Given that the Loyola SMIF is an equity only fund, it is benchmarked against the S&P 500. The initial weeks at the start of a semester (new class of student fund managers) are crucial to the performance of the fund. The faculty mentor for the SMIF must: (i) organize students into five groups (each group is responsible for researching two sectors of the S&P 500) and (ii) discuss the current state of the market, the macro economy, the political situation, etc. This is exceptionally important as it allows students to get a bird's eye view of these conditions and a look at broader issues so that they can then begin their research. It is also their first opportunity to have a discussion in this group setting and (iii) ask students to come up with sector target allocation for the fund for the semester. By the end of the second week, they are asked to (individually) vote on which sectors they would like to possibly overweight or underweight in relation to the S&P 500. These are not set in stone, and can be voted on again during the semester, but coming up with this initial target allocation can help provide guidance for sectors that the students should be looking for potential investments, if the class would like to overweight a sector that needs additional representation in the SMIF.

Additional Benefits of a Course Based SMIF

Besides the obvious benefits of a SMIF discussed previously in the literature, this paper proposes that a course-based format has benefits that make it a great choice. Specifically: (i) provide a transformative and highly sought-after experiential learning experience to approximately 20 students each semester (ii) given the high-profile nature of the class, use the course to secure funding for Bloomberg terminals, Capital IQ, and Morningstar data platforms from sources such as alumni and corporations. What was additionally beneficial was that these data platforms could be used in other finance (and business related) courses also. This resulted in more professors adopting the use of these data platforms to make their course delivery more practical and industry-oriented (iii) based on feedback from University trustees and SMIF course participants recognizing the need to prepare students for investment banking careers earlier, a Junior

Analyst course for sophomores was developed to get students exposure to the field of finance earlier in their academic careers and (iv) it is not unusual for exceptional incoming freshmen to have already used data platforms like Bloomberg in high school. These students are attracted to Loyola University Maryland partly because of the SMIF, which allows the University to enroll motivated students, many of whom will end up managing the SMIF.

CONCLUSION

A SMIF is a valuable addition at a University, to advance the curriculum and to give finance students the ultimate experiential opportunity. Drawing upon our experience with managing a SMIF since 2006, we add to the literature on SMIFs by providing a template for structuring a meaningful SMIF. We address the administrative aspects, student learning, and provide guidance to the faculty mentor in charge of the fund. We share the specific language of the investment oversight and process, and what we have learned through the management of this fund since 2006, and the changes that we have made to streamline the process and highlight best practices.

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COMPARING LEARNING OUTCOMES ON FACE-TO-FACE AND ONLINE TEACHING PLATFORMS: EVIDENCE FROM MAJOR FIELD TEST SCORES

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ABSTRACT

Online instruction is becoming an increasingly popular course delivery system. This paper examines performance outcomes of finance students receiving face-to-face instruction versus online instruction. We compare the Educational Testing Service Major Field Test (ETS) finance sub-scores of students enrolled in online sections of Principles of Finance with those enrolled in face to face sections over a three-semester period. Results show no evidence of performance differences between online and face to face students.

INTRODUCTION

Many universities provide online and face-to-face (F2F) versions of the same courses. These dual course delivery systems allow students to self-select the teaching approach that most suits their learning style and accommodates their geographic preferences, working schedules and family schedules. Growth in online courses has been substantial. Approximately 5.8 million students enrolled in at least one distance learning course in the fall of 2014. This figure represents a 3.9 percent increase from 2013 figures (Friedman, 2016).

A considerable body of research compares online and face-to-face teaching methods. For the most part, the research finds little difference between the performance of students in online versus face to face courses. Nevertheless, this area warrants further research. Since its inception, online course delivery has been refined in a variety of ways. These refinements include vast improvements to the technology and improved security for testing. Given the constant improvements in online teaching tools, new examinations of the performance of online versus face to face courses make a valuable contribution to the extant literature.

This paper provides additional evidence on the efficacy of face-to-face versus online teaching platforms. We examine business student performance from a U.S. regional Midwestern university with three campuses and total enrollment of approximately 10,000 graduate and undergraduate students. Undergraduate students in the Business College can choose from ten different majors to earn the B.S. degree: Accounting, General Business, Entrepreneurship, Financial Management and Financial Planning, Hospitality Management, Information Systems, Marketing, Management and Supply Chain Management. One of the core requirements for all majors is Principles of Finance. This course has the reputation of being particularly difficult for students with D, F and drop rates as high as 40%.

With the increased student demand for online courses across the curriculum and rumors that online courses were easier and more susceptible to cheating, the finance faculty were concerned that online delivery might affect the integrity of the Principles course and degrade learning outcomes in an important core course. In other words, is there any difference in student learning between online and face to face delivery methods?

The remainder of the paper is organized as follows. In the next section, we provide a review of the extant literature. The paper continues with discussion of the data and methodology used to test our propositions. Next, we present the results of the study. The paper closes with some concluding comments and suggestions for future research.

LITERATURE REVIEW

Pringle and Michel (2007) conduct a survey of 138 universities to determine assessment practices utilized by business schools. Their results show that more than one third of universities used the Educational Testing Service Major Field Test (ETS).

Terry, Mills Rosa and Sollosy (2009) examine the performance of business students on the ETS. Their findings reveal that counting student performance on the ETS as a part of the capstone course grade significantly increases performance on the exam. They find that completing the course online does not impact ETS scores earned. The evidence also shows that, gender, transfer student status and international student classification do not significantly impact ETS scores earned.

Bagamery, Lasik and Nixon (2005) examine determinants of success of ETS exams. They specifically focus on an undergraduate multisite business program. Their results reveal that gender, grade point average and having taken the SAT score predict ETS exam scores. However, on campus or off campus course location did not significantly impact scores. Further, they found that age, transfer status and major did not explain exam scores.

Conteras, Badu, Chen and Adrian (2011) examine student performance on the ETS exam for 352 students at a U.S. state university. Their results show systematic differences in test scores based on major. Finance majors earned the highest scores while management majors earned the lowest scores. They also find that student age, and gender explain exam performance. Males earn higher scores as do older students.

Mason, Coleman, Steagall and Gallo (2011) argue that ETS field exams provide little new information than is already contained in standard university evaluation systems such as grades. They examine performance of 873 students at one university. Their results show that a simple model using GPA, SAT and demographic variables predicts the ETS score with regressions producing R^2 values of more than 58 percent. They argue the opportunity costs associated with administering the exam may exceed $30,000 per year and does not produce a value corresponding to the cost.

Zhu (2012) finds cultural differences in student performance and satisfaction in online courses. He compares the satisfaction of Chinese and Flemish students in an online course. Results show the Chinese group was more satisfied with the equal contribution by group members and found the online learning environment to be new and exciting. He finds that Flemish students spent more time working on the project and were more satisfied with final product.

Paechter and Maier (2010), survey 2,916 students from Australian universities. Their results show that students prefer different teaching modalities depending upon the topic being taught. Students prefer online elements for the dissemination of information. However, they prefer fact-to-face learning when learners must agree on a shared meaning or develop a joint solution.

Huan, Chou, Chen and Owen (2010) utilize an Online Learning Readiness Scale (OLRS), to evaluate the preparation of Taiwan undergraduate students. The scale utilizes five dimensions to assess student readiness. Gender did not impact any of the dimensions. However higher GPA students were more prepared for online education. Higher GPA students showed higher readiness in online communication self-efficacy, self-directed learning, learning control and learning motivation.

Xu and Jaggars (2010) examine about 500,000 courses taken by 40,000 Washington State community and technical college students. Their results show all types of students experience reduced performance in online versus face-to-face classes. The largest performance gaps occurred among younger students, males, Black students and those with lower grade point averages. After controling for individual and peer characteristics, students in social sciences and applied professions, including business, continued to demonstrate a significant performance gap. This finding suggests that the usefulness of online teaching approaches might vary by discipline.

DiRienzo and Lilly (2014) examine the performance of 120 business students in face-to-face and online learning formats. Their results show that student performance on both basic and complex assignments do not differ based on course delivery method. However, they find some evidence of differences based on business discipline of courses taken. They find that students view the class to be equally difficult regardless of course delivery method.

DATA AND METHODOLOGY

We collected data for ten classes over a three-semester period Fall 2009 through Fall 2010. All data were collected from a single university. During this period all business administration majors were required to take a Principles of Finance course. Students usually complete the course in the junior year. The ETS Major Field Test for Business is administered as an exit exam in the Policy capstone course, usually the last course taken. The ETS Major Field Test consists of questions from nine areas of business including: Accounting, Economics, Management, Quantitative Business Analysis, Finance, Marketing, Legal and Social Environment, Information Systems, and International Business.

ETS provides large-sample normed total scores for the entire test and sub-scores for each business area to participating schools. Detailed information about the exam can be obtained from the Educational Testing Service website (www.ets.org/mft). We believe that the finance sub-scores were the most objective performance measure available to us and would be an unbiased metric for our comparison. There were 293 students enrolled in our sample classes but because students could complete the Principles course a year or more before taking the capstone, we only had ETS scores for 93 students at the time the College decided to drop the MFT as the exit test. Thus, our sample represents 31.7 percent of the population. Students were classified as face-to-face or online based on University enrollment records for the Principles of Finance course. We conduct t-tests on differences in performance between the two groups. We also complete a regressions on the total and sub-scores to further identify determinants of ETS score outcomes.

Table 1 shows the average and median scores comparison between the entire ETS participating institution population and our Principles of Finance classes sample. Total sample data are reported as well as data segregated by online and face-to-face delivery systems.

Table 2 shows the distribution of major area of study among test takers. The table shows the number of sample observations for each major. In addition, the data is segregated by instruction method. Accounting majors represent the largest contingent with twelve students taking the online course and eleven students taking the face-to-face course. Other popular majors include management, marketing, general business and hospitality management. The sample includes only two observations each for financial management

and financial planning majors. Thus, the results presented here primarily reflect the performance of non-finance majors.

Table 1: Summary Statistics

	ETS Total Score Average	ETS Total Score Median	ETS Finance Sub-score Average	ETS Finance Sub-score Median
ETS All Schools	150.3	151	42.4	42
Our School	150.1	148	47.3	44
Online Sample	151	151.5	46.6	44
F2F Sample	149.3	147	47.9	44

This table shows summary statistics for the Educational Testing Service Major Field Test (ETS MFT) and the sample school. The sample includes 93 students across three semesters.

Table 2: Distribution of Students to Each Platform by Major

Major	Online	Face to Face	Total
Accounting	12	11	23
General Business	9	4	13
Entrepreneurship	2	1	3
Financial Management	0	2	2
Financial Planning	0	2	2
Hospitality Management	3	8	11
Information Systems	4	4	8
Marketing	5	5	10
Management	9	10	19
Supply Chain Management	0	2	2
Total	44	49	93

This table shows sample distribution data. Figures in each cell indicate the number of students
in the sample enrolled int he Principles of Finance course in either Online or Face to Face sections.

RESULTS

Table 3 shows results of t-tests between the face-to face (F2F) group and the online group (OL) for the Educational Testing Service Major Field Test (ETS) finance sub-scores. Our primary hypothesis is that F2F students will outperform online students on the Major Field Test, but we examine the data with and without directional priors. Table 3: Finance Sub-scores Comparison for Face to Face versus Online Teaching

	F2F	*OL*
Mean	47.90	46.57
Variance	325.47	342.72
Observations	49.00	44.00
Pooled Variance	333.62	
Hypothesized Mean Difference	0.00	
t Stat	0.35	
P(T<=t) one-tail	0.36	
t Critical one-tail	1.66	
P(T<=t) two-tail	0.73	
t Critical two-tail	1.99	

This table shows results of two-sample t-tests for differences in means. The test is conducted assuming the samples have equal variance. The variable of interest is the Educational Testing Service Major Field Test (ETS) finance subscore. F2F signifies the group of students who received face-to-face instruction. OL signifies the group of students who received online instruction.

Results are similar both with and without directional priors. The p values are low and insignificant for both the 1 and 2 tailed tests. An informal survey of finance instructors at the University suggested their priors

were finance sub-scores for F2F would be significantly higher than online. Thus, we have no evidence of a difference in exit exam scores for F2F versus OL courses.

Table 4 shows results of t-tests between the Face to Face (F2F) group and the online group (OL) for the ETS for overall scores. Similar to the finance sub-scores results; results here are similar both with and without directional priors. The p values are low and insignificant for both the 1 and 2 tailed tests.

Table 4: Total Score Comparison for Face to Face versus Online Teaching

	F2F	OL
Mean	149.33	151.05
Variance	158.35	190.18
Observations	49.00	44.00
Pooled Variance	173.39	
Hypothesized Mean Difference	0.00	
t Stat	-0.63	
P(T<=t) one-tail	0.27	
t Critical one-tail	1.66	
P(T<=t) two-tail	0.53	
t Critical two-tail	1.99	

This table shows results of two-sample t-tests for differences in means. The test is conducted assuming the samples have equal variance. The variable of interest is the Educational Testing Service Major Field Test (ETS) total score. F2F signifies the group of students who received face-to-face instruction. OL signifies the group of students who received online instruction.

To further examine the data, we conduct regression analysis. The regression includes explanatory variables for grade point average (GPA), the number of online courses taken by the student to date (#OLPREV) and the student's online GPA (OLGPA). The analysis also includes dummy variables for course delivery method (1= Online) and gender (1=Male). We include a series of dummy variables for major with 1 indicating the student is a major and 0 indicating otherwise. We code the majors: Business Administration (BADM), Entrepreneurship (ENTR), Financial Management (FINM), Financial Planning (FINP), Hospitality Management (HTM), Information Systems (IS), Management (MGMT), Marketing (MKT), and Supply Chain Management (SCM). We also include a dummy variable indicating if the student is a transfer from another school (1=transfer).   Equation 1 shows the full model.

$$ETS\ Score = \alpha + B_1(GPA) + B_2(Online\ DV) + B_3(Gender\ DV) + B_4 \ldots \ldots B_{12}(Major) + B_{13}(Transfer) + B_{14}(\#Online\ Courses) + B_{15}(Online\ GPA) \qquad (1)$$

Table 5 shows the regression results for the full model run against the ETS total scores. Significant explanatory variables at the 5% level for the ETS Total Scores are GPA, gender and the majors HTM and MGMT both being significantly negative. The intercept represents the score of a female accounting major since the accounting major dummy is excluded to avoid overidentifying the model. Males on average scored 6.14 points higher than the intercept. Hospitality management and management majors produce significantly lower scores. The online variable is not significant. This model results in an Adjusted R^2 = 0.10.

Table 6 shows regression results for the full model when the dependent variable is the ETS finance sub-score. Gender and the majors BADM, IS and MGMT are significant at the .05 level, but GPA is no longer significant when considering the sub-scores. Again online is not significant. Adjusted R^2 = 0.18.

Variance inflation factors of the explanatory variables do not suggest a multicollinearity problem as all are well under five. But as a further check we run regressions on the ETS sub-scores with a reduced set of

explanatory variables. The direct test of our question is specified by the model:

$$ETS\ sub - score = \propto\ + \beta_1\ OL. \tag{2}$$

This model of course doesn't control for any other variables. The t statistic is -0.35 and the model $R^2 = 0$.

Table 5: Full-Model Regression on ETS Score

	Coefficient Estimates	**t Statistics**
Intercept	136.34	13.53***
GPA	7.54	2.16**
OL	-1.25	-.39
Gender	6.14	2.08**
BADM	-4.98	-1.14
ENTR	9.55	1.23
FINM	7.58	.81
FINP	-13.49	-1.40
HTM	-9.92	-2.11**
IS	-5.27	-1.01
MGMT	-9.07	-2.34**
MKT	-1.65	-.35
SCM	-14.35	-1.54
TRAN	1.57	.54
# PREV OL	.82	.90
OLGPA	-3.45	-1.50
R^2=.10		
No. of observations = 93		

This table shows the regression results when the ETS Total Score is the dependent variable and the full set of regressor variables GPA, number of online courses taken previously, online GPA and dummy variables for gender, online, and transfers. Specifically, the estimated equation is: $ETS\ Score = \alpha + B_1(GPA) + B_2(Online\ DV) + B_3(Gender\ DV) + B_4 \ldots \ldots B_{12}(Major) + B_{13}(Transfer) + B_{14}(\#Online\ Courses) + B_{15}(Online\ GPA)$. ****,**,* denotes significance at the .01,.05 and .10 levels respectively.*

Our priors are that grade point average should be significantly related to the finance sub-scores and so we add GPA to the model:

$$ETS\ sub - score = \propto\ + \beta_1\ OL + \beta_2(GPA) \tag{3}$$

The t statistics are not significant; -0.01 for OL and -0.34 for GPA. $R^2 = 0$.

If we add gender to the model:

$$ETS\ sub - score = \propto\ + \beta_1\ OL + \beta_2(GPA) + \beta_3(Gender) \tag{4}$$

Gender is positive and significant at the 0.01 level. Model $R^2 = .072$

When we perform regressions with all other combinations of variables adding #Online Courses, Online GPA and Transfer, only Gender is significant and R^2 is reduced below .072. The online variable is not significant in any of the regressions we perform.

Comparison of regressions on the ETS sub-scores shows that while none of the models had high explanatory power, as expected, the full model had the highest R^2. All the models show gender as significantly positive. Specifically, male scores are significantly higher on the ETS Total Score and the Finance Sub-score than female scores.

When the effect of majors is included a male, entrepreneurship major is predicted to score 31 points higher than the referent female accounting student. Female general business, management, information systems

and supply chain management majors scores is predicted to be between 14 and 24 points lower than the referent female accounting student.

The gender effect is stronger in the finance sub-score results than the total scores. Strangely, hospitality management students score significantly lower on the total score but not on the finance sub-scores.

Table 6: Regression Full Model on ETS Sub-scores

	Coefficient Estimates	t Statistics
Intercept	50.24	3.68***
GPA	-2.00	-.42
OL	-1.40	-.32
Gender	12.49	3.13***
BADM	-13.50	-2.29**
ENTR	18.59	1.76*
FINM	10.52	.83
FINP	-16.08	-1.23
HTM	-9.49	-1.49
IS	-15.17	-2.15**
MGMT	-15.26	-2.91***
MKT	-4.64	-.72
SCM	-23.79	-1.88*
TRAN	2.73	.69
# PREV OL	.58	.47
OLGPA	1.07	.34
R^2 = .18		
No. of observations = 93		

This table shows the regression results when the ETS Sub-score Score is the dependent variable and the full set of regressor variables GPA, number of online courses taken previously, online GPA and dummy variables for gender, online, and transfers. The estimated equation equals: $ETS\ Sub-score = \alpha + B_1(GPA) + B_2(Online\ DV) + B_3(Gender\ DV) + B_4 ... ... B_{12}(Major) + B_{13}(Transfer) + B_{14}(\#Online\ Courses) + B_{15}(Online\ GPA)$. ***,**,* denotes significance at the .01,.05 and .10 levels respectively.

CONCLUDING COMMENTS

This paper compares the performance of students who take the introductory finance course in an online versus face-to-face format, at regional state university in the Midwestern United States. Specifically, we compare the mean scores on the ETS finance sub-scores for a sample of 93 students from a Midwestern university who took the course either face-to-face or online. We find no significant difference between the mean scores of the two groups suggesting the delivery method does not significantly impact the learning outcomes.

We also tried to control for the effect of other variables including grade point average, gender, transfer status, major, online courses taken and online grade point average.

This study is limited as it examines students from only one university for one year. Moreover, the sample size was drastically reduced from what it could have been had the College not decided to discontinue the exit test. The obvious conclusion that can be drawn from this research is it doesn't appear that students who took the Principles course online performed significantly worse on a large sample standardized test accepted at schools large and small around the country as indicative of proficiency in the field. Therefore, whatever faculty priors concerning the efficacy of online delivery were, they seem to be disproven. Moreover, our results are consistent with the literature suggesting no difference between learning outcomes between the two delivery methods as found in the literature referenced previously.

However, this study raises some questions for further research. Is the ETS test the best instrument to use as a proficiency indicator? Does it align well with course learning objectives? How do you measure qualitative differences between online and face-to-face classes? It seems online education is here to stay and growing. Examining the impact of new technologies like Zoom for synchronous class experience and Respondus

monitor and lockdown browser to ensure, as much as possible, that we know who is actually taking the test, should help everyone feel more comfortable that e-learning is comparable to in-seat courses. We utilized GPA and other variables to control for student quality. However, these measures might not adequately capture finer qualities that distinguish students. Further studies might utilize additional control variables to improve our understanding.

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FLIPPING THE CLASSROOM TO STIMULATE ACTIVE LEARNING IN HIGHER EDUCATION STUDENTS

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ABSTRACT

The objective of this research is to implement the flipped classroom model as a teaching strategy for active learning. The approach here takes advantage information and communication technology potentials, as an essential factor in stimulating and improving significant learning undergraduate students in Industrial Economics. The analysis included a sample of 30 undergraduate students in Industrial Economics studying theory econometrics in their sixth semester during the academic year 2017-2018. The students are from the National School of Higher Studies Leon Unit of the Universidad Nacional Autonoma de Mexico. The results reveal significant improvements in the learning of the students that followed the flipped classroom methodology.

JEL: A22, I21

KEYWORDS: Flipped Classroom, Active Learning, Higher Education

INTRODUCTION

T his paper describes the results of an innovative teaching experience that introduces a flipped classroom model for the improvement of the active student learning. The model is applied to sixth semester students in the econometric theory course in 2017-2018. The course is part of the undergraduate in Industrial Economics program of the National School of Higher Studies Leon Unit of the Universidad Nacional Autonoma de Mexico. The university has head offices in the city of Leon, Guanajuato, Mexico. One problem that arises in classes is a lack of selflessness, low utilization, and a passive role that students take in their own learning. It is the professor's responsibility to foster student motivation to achieve active participation. At present, some students at the University are digital natives. They use different information and communication technologies including smartphone, tablets and computers. However, they regularly do so primarily for purposes of entertainment or social communication with friends or family. There is little educational use of technology with the purpose of improving learning. It is then up to professor, to adapt to these roles of participation and become a mediator-facilitator of the programming.

The flipped classroom model inverts the roles of traditional teaching. Class activities, usually taught by the teacher, are now carried out by the student from his/her home (study of the previous reading of indicated material), through the use of multimedia technologies (smartphone, tablet, laptop, others). The attending sessions involve activities that require a greater participation and interaction, where the teacher participates only as a facilitator (Lage, Platt and Treglia, 2000). This study proposes to use the model flipped classroom to promote a more active role among the students who study theory econometrics, with the purpose of motivating them to learn and find new knowledge in the use of digital devices or their applications. The goals is to do so in a way that, from their home or any site, they use the technologies for a didactic purpose. Guided by the teacher as facilitator, they can carry out work that make possible a more active, participative

role in the construction of their learning. Time in the classroom will be better used for activities that require a greater participation and interaction, in addition to the direct supervision on the part of the teacher.

The central objective of this work is to analyze the flipped classroom as a strategy for education that stimulates active learning of students. The research question is: To what extent does the Flipped Classroom model favor active learning among undergraduate Industrial Economics students? Through the use of a flipped classroom, we can form more autonomous, independent, self-constructive, participatory students with a high confidence in themselves. This in turn will develop other competencies that can facilitate the exercise of their profession. The structure of this document is organized as follows. First we present a review of the literature related to the various approaches that make up and theories that support the model of the flipped classroom. Next the paper presents the methodology that consists of an empirical study through the analysis of a sample of 30 students. The paper closes with conclusions obtained from the main results.

LITERATURE REVIEW

The inverted classroom was examined the first time by Lage, Platt and Treglia (2000) to detail the class strategy implemented in a specific economics subject (Tucker, 2012). Subsequently, Bergmann and Sams (2012) searching for a solution to prevent students from missing classes, began recording course lectures and distributed the videos among students for review. They developed and put into practice, what they called the Flipped Classroom model (Bergman and Sams, 2012; Talbert, 2014). The flipped classroom model developed by Bergmann and Sams (2012) brought a change in the dynamics of work in the classroom. It reverses the roles of traditional teaching, where the class activities, usually given by professor, are now performed by the student at home (study of the previous reading of indicated material), through the use of information and communication technologies (videos, forums, chat, email, social networking) and other tools and resources. These tools and resources are based on information and communication technologies, which allows a constant interaction of the student with the teacher and with their classmates. This process leaves open time for face-to-face sessions activities which require a greater participation and interaction, where the teacher participates only as a facilitator (Bergman and Sams, 2014).

Integration of emerging technologies in learning offers more content options and redefines class time as an environment focused on student (MacKinnon, 2015). In addition, to be considered items of technology, the theoretical framework of learning is related to the model constructivist (Davies, Dean and Ball, 2013), and specifically of Vigotsky (1980) with regard to the process of collaborative construction, questioning and problem resolution in a joint work program (Vigotsky, 1980). Implementation in a context of collaboration and exchange between students, stimulates and encourages the student teaching and learning, promoting the group participation discussions and the resolution of problems (Angelini, 2016). Experiential learning is based on a process of "student-centred continuous learning", in which the student experiences, reflects, contemplates and acts on what is learned (Coufal, 2014). In the flipped classroom, experiential learning allows student to practice in class, experiment, reflect, think and act in the construction of knowledge (Yeganeh and Kolb, 2009).

The foregoing, flipped classroom model, considers the identification of competencies a goal to be developed in the student. The teacher must classify the content that need to be learned by direct instruction (video-conference) and those that are better in experimentation. To reach the goals we should proceed with a methodology centered on the student (Bishop and Verleger, 2013), which leads to the implementation of active tasks and collaboration involving the deployment of mental activities where the teacher participates as facilitator (Baepler, Walker and Driessen, 2014). The flipped classroom has been transformed in recent years in a didactic resource of great relevance, whose extension and dissemination demonstrates the benefits available in the development of some programming and inserts a culture of digital learning life long learning (Coufal, 2014).

Flipped Classroom Model Student-Centered

Experiential learning is based on a process of "continuous learning student-centered", in which the student experience, reflects, contemplates and acts on what is learned (Coufal, 2014). In the case of the flipped classroom, experiential learning allows the student practice in class, experiment, reflect, think and act in the construction of knowledge (Yeganeh and Kolb, 2009). The approach requires the help of the educator to reach its full potential, in addition to highlighting the importance of collaboration and interaction between student and teacher. Therefore, it involves implementation in a context of collaboration and exchange among the students, stimulating and promoting the teaching of students learning, promoting group participation, group discussions and resolution of problems (Findlay-Thompson and Mombourquette, 2014). The flipped classroom model, considers the identification of target competencies that must be developed in the student a critical activity. The teacher must classify the content that need to be learned by direct instruction (video-conference) and those that are better placed in the experimentation (Davies, Dean and Ball, 2013). To reach the goals professors proceed with a methodology centered on the student (Bishop and Verleger 2013) which leads to the implementation of active tasks and collaboration involving the deployment of mental activities within the classroom where the teacher participates as facilitator (Kong, 2014). The flipped classroom has been transformed in recent years into a didactic resource of great relevance, whose extension and dissemination demonstrates the advantages it can offer for the development of optimal learning and inserts a culture of digital learning throughout life (Galway, Corbett, Takaro, Tairyan and Frank, 2014).

Flipped Classroom Model that Favors Meaningful Learning

This section describes theories about how the Flipped Classroom model offers a series of study alternatives. Student participation, the environment and the professor mediation from multimedia technologies, are essential elements for the improvement of the significant learning. This approach allows for review and study of the task or activity access if it is inside or outside the classroom. To develop the classroom conversely Lage, Platt and Treglia (2000) discussed the need to improve learning in a group economy and levelling the different types of learning that existed in one area. This is especially important when there exists diversity of students gathered in a group and the traditional styles of teaching of professor. In this perspective, the authors developed an environment of media with different levels of learning so that students could access easily and to integrate the group (Mason, Shuman and Cook, 2013; Mattis, 2014).

The Flipped Classroom model, through the support of multimedia technologies, allows the student to choose the best method, time and space to acquire the knowledge at his/her own pace (Cheung, 2014). The material is found in the multimedia system at different levels, for which the student can easily access. It is the responsibility of both actors participants to review the materials. The student devotes space and study for the apprehension of knowledge, and the teacher as a coach and facilitator to guide the practical activity for the improvement of significant learning (Angelini, 2016; Enfield, 2013; Enfield, 2013, Estes, Ingram and Liu, 2014). To implement the Flipped Classroom model successfully in the classroom, from the beginning of the academic cycle, the teacher notifies students of the steps to follow on the use of the new innovative methodology. These include the objectives and planning to implement the new model, training in the use of the Flipped Classroom model. This structure provides the student of numerous opportunities to demonstrate, with the practice, the apprehension of the content (Blair, Maharaj y Primus, 2015).

The central investigation of this work is to analyze whether the Flipped Classroom model and the use of multimedia technologies favors the learning of students who study the course theory econometrics. Students in the sample were in the sixth semester of the school year 2018, of the undergraduate in Industrial Economics in the National School of Higher Studies Leon Unit. If strategies like the inverted classroom are used more in higher education schools, we may form more autonomous, independent, self-constructive,

participatory students with a high confidence in themselves. This in turn will develop other skills that will facilitate the tasks the exercise of their professions.

METHODOLOGY

The methodology here is qualitative descriptive. The method is of observation and semi structured interviews, with the intention of obtaining information about the perception and experience of the students regarding implementation of the Flipped Classroom model. We examine if students achieve more active learning and improve the learning processes learning in higher education. We examine the method by observation and semi structured interviews with the goal of thinking about how to understand the perspective of the participants. We wish to learn how to study in depth the experiences, perspectives, opinions and meanings of the Flipped Classroom model (Cohen, Manion and Morrison, 2007). Since the method is qualitative, the research is non-probabilistic, and its results cannot be generalized to a population greater than that corresponding to the study object. However, the results obtained through interviews are of great importance, as it gathers information about the student's perception and experiences in the natural way of the classroom reality (Cohen, Manion and Morrison, 2007). The obtained results allow analysis and evaluation of the Flipped Classroom model. We examine if it stimulates and favors active learning among the students taking part of the undergraduate in Industrial Economics of the National School of Higher Studies Leon Unit, during the school year 2018.

Population Object of Study

The study population is composed of a group of 30 students who study the course of econometric theory, during the school year 2017-2018. Semi-structured interviews were applied to a sample of 30 students, who voluntarily participated in interviews with the purpose of investigating the process of implementation of the Flipped Classroom model. Participating students were willing to use part of their time to review classroom contents in your home, and subsequently presenting the results in class.

Instrument

One way to acquire data is simply to ask questions. Interviews and questionnaires apply this method. They gather information about facts, beliefs, feelings and intentions. Instruments as a data collection technique should take into account elements such as the approach raised in the research, the information to be collected, the characteristics of the source of information and the time for the process (Cohen, Manion and Morrison, 2007). Given the nature of the study under the qualitative paradigm, the instrument to be used is that of observation and semi-structured interviews. The semi-structured instrument contains selected questions with the purpose of gathering information about the perception and experiences of students about the process of implementing the Flipped Classroom model.

RESULTS AND DISCUSSION

This section presents an instrument with semi-structured interviews. The semi structured interview obtained information on content and issues that emerge and that can shed light on important aspects of the study subjects (Cohen, Manion and Morrison, 2007). The questions of the semi structured questionnaire gathered information and respond to the research question. This information enables and displays new perspectives experienced by a student in the Flipped Classroom model. The questions that give response to these reflections are: Has the Inverted Classroom model helped understand the main concepts of each topic? Has the use of digital technologies or multimedia in the course helped your understanding? What is your degree of satisfaction with the Flipped Classroom model in the course? What importance does the Flipped Classroom model have in knowledge and its learning?

These questions allow students to reflect and discuss implementation of the model Flipped Classroom. The perspective obtained from the results help identify the potential benefits, opportunities and improvement elements of active learning.

Interpretation of Results

Table 1 shows the findings derived from the opinions expressed by a sample of 30 students when using the Flipped Classroom methodology in the econometric theory course in the undergraduate in Industrial Economics of the National School of Higher Studies Leon Unit, in the period 2017-2018.

Panel A of Table 1 shows the results of the question 1 " Has the Inverted Classroom model helped understand the main concepts of each topic?" That answer expresses the expectation that students have when using the Flipped Classroom methodology for understanding knowledge and improving active learning. The answer is largely positive with 53.8% of the students expressing their agreement and 61.5% of responses expressing fully agreement. Only 7.7% of students were in disagreement and the remaining 30.77% were indifferent. We conclude from the interviews that 38.5 per cent of students are still find it difficult to apply the flipped classroom for all topics in the course.

Panel A shows that self-employment and collaboration of the students are of great importance for the success of the flipped classroom model. This is accompanied by the guidance of the teacher in the classroom and outside of the class. The Flipped Classroom model gives students more autonomy and responsibility in their active learning process. The teacher is a facilitator who should devote more time because they must continuously follow up the tasks that the student develops both from home and when presenting activities in the classroom.

Panel B of Table 1 shows the results of Question 2 "Has the use of digital technologies or multimedia in the course helped your understanding?" Answers indicate that the majority of students interviewed, 38%, fully agreed, in addition to 69.3% indicating agreement. Only 7.7% of students commented that they disagree and 23% of students were indifferent. We conclude from the interviews that students find it useful to implement digital technologies to improve active and meaningful learning in the classroom. The essential element of the Flipped Classroom model is the appropriate use of multimedia technologies to improve the learning processes in education. Digital technologies play a key role by through advantages that it offers for the review of tasks and practices available on a web platform through videos and readings. We conclude that media resource technology is relevant in education as a means to improve learning in the classroom.

Panel C of Table 1 present the results of the question 3 "What is your degree of satisfaction with the Flipped Classroom model in the course?" The results show that a high percentage, 46.1%, expressed agreement joined with 61.5% of respondents who fully agree. Students interviewed claim that the Flipped Classroom model is a major factor that motivates the work done inside and outside of class. It can significantly influence performance and is always under the accompaniment and guidance of the teacher. In contrast, 38.4% of students did not believe the Flipped Classroom generates greater satisfaction or greater performance in active learning compared to a traditional type class. Panel C shows in a positive manner that fundamental characteristics of the Flipped Classroom model, the motivation and the degree of satisfaction, are essential elements for a better development of the knowledge and a greater understanding of active learning.

Panel D of Table 1 presents the results of the question 4 "What importance does the Flipped Classroom model have in knowledge and its learning?" The results show a high percentage, 76.9%, responded with full agreement and agree. This indicates that the Flipped Classroom model is a fundamental factor for the acquisition of knowledge and promotes the active learning in the classroom. Only 7.69% of students

interviewed did not find the model generates greater performance in the learning than the traditional method. Finally, 15.3% of those interviewed were in disagreement with the prospect that the Flipped Classroom model influences the acquisition of a greater knowledge relative to traditional teaching. In summary, Panel D shows the importance the Flipped Classroom model has in knowledge. It allows greater learning by students.

Table 1: Results on the Implementation of the Model Flipped Classroom in the Course Econometric Theory, Period 2017-2018

Panels: Results of Semi-Structured Questions	Percentage on the Implementation of the Flipped Classroom				
	Totally Agree	**Agree**	**Indifferent**	**Disagreement**	**Total**
					30
Panel A: Semi-structured questions 1 Do you has proved useful to the methodology of the Classroom inverted to understand the main concepts of each topic?	7.7	53.8	30.8	7.7	100.0
Panel B: Semi-structured questions 2 Do you has proved useful the use of digital technologies or multimedia in the course?	38.5	30.8	23.0	7.7	100.0
Panel C: Semi-structured questions 3 What is your degree of satisfaction with the Flipped Classroom model in the course?	15.4	46.1	38.5	0.0	100.0
Panel D: Semi-structured questions 4 What importance does the model Flipped Classroom have in the knowledge and its learning?	46.2	30.8	7.7	15.3	100.0

Table 1 presents the percentages answered a sample of 30 students on the use of the model Flipped Classroom in the course Econometric Theory in the undergraduate in Industrial Economics of the National School of Higher Studies unit Leon, in the period 2017-2018. Panel A presents the results concerning the expectations of students regarding the understanding of knowledge and improve the active learning in the theory of econometrics course.. Panel B show the importance that students place on the use of technological resources and multimedia in education and the use of the model Flipped Classroom to improve the active learning in the classroom. Panel C shows the degree of satisfaction and the role that the student expects with the implementation of the Flipped Classroom model. Panel D presents evidence on the importance that the Flipped Classroom model has in allowing greater learning of the student.

CONCLUDING COMMENTS

The objective of this work was to analyze the model Flipped Classroom as a strategy for education that stimulates active learning of the students that studying theory of econometrics in the undergraduate in Industrial Economics of the National School of Higher Studies Leon Unit of the Universidad Nacional Autonoma de Mexico, in the period 2017-2018. The method consists of the application of an instrument with semi-structured questions to a sample of 30 students, with the purpose of gathering information about the perception and experience of the students regarding the Flipped Classroom model.

Results show that use of the Flipped Classroom model is a didactic form that generates greater autonomy and collaboration among students for the fulfillment of their tasks and practices from home and when presenting the activity in the classroom. In addition, it generates a prepositive and critical thinking that facilitates understanding and promotes active learning as it encourages and stimulates greater active participation of students. The appropriate use of multimedia technologies play a fundamental role in the implementation of the model flipping Classroom, by the advantages it offers for improving the learning processes in education. Use of these digital technologies facilitates the review of tasks and practices. One of the fundamental characteristics of the flipped classroom model, the motivation and the degree of satisfaction of the customers, are essential elements for better knowledge development a greater understanding of student's active learning. The flipped classroom generates critical thinking that facilitates understanding and promotes active learning. Students indicated the Flipped Classroom model promotes

collaboration and responsibility. It facilitates communication through the use of digital technologies.   The support of multimedia technologies greatly enhances the flipped classroom experience.

There are many teachers who use the traditional teaching in the delivery of their subjects.   This may occur because of a lack of teacher training or a lack of awareness of these new innovative methodologies. So there exists a challenge to implement the flipped classroom model in certain subjects and careers. Another limitation that could involve the use of the strategy of the classroom reversed is the difficulty of students to adapt to this strategy. On the other hand, to implement this methodology, it requires an extra effort, both the students and the teacher.

The results here reveal challenges to implementing the Flipped Classroom model. Teachers should be trained and prepared to implement the Flipped classroom model. It is also important to prepare students for an obvious change in the processes of acquiring knowledge and active learning in the classroom. Future research might provide a better understanding of the processes of teaching and learning and to improve the active learning among students. Future research might also extend the implementation of the Flipped classroom model to other courses. Finally, it is necessary to evaluate and analyze the academic level of active learning of students after the implementation of the Flipped Classroom model.

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INTEGRATING EXTENDED EXPERIENTIAL GROUP LEARNING PROJECTS INTO UNDERGRADUATE MARKETING CLASSES: OBSERVATIONS, PROCESSES AND LESSONS LEARNED

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ABSTRACT

For a decade and a half, the author has integrated experiential learning into marketing and business classes with the goal of deepening student learning of concepts and theories, as well as, promote the use by students of theories and concepts into situational analyses and development of relevant resulting recommendations. The focus of this article is to discuss the purposes, processes, outcomes and challenges of integrating an extended group experiential learning project – one lasting approximately 12 weeks – into an upper division undergraduate semester-based marketing class. The results of these experiential projects were well received by both students and their business clients.

INTRODUCTION

While lectures are the most often used delivery method of content in undergraduate education (Fulford, 2013), the increased focus on experiential learning has been significant in the last several decades as influenced by Kolb's early work on the modern theories of experiential learning and further built on the writings of Dewey, Lewin and Paiget (Neilsen-Englyst, 2003).

Integrating experiential learning "can be challenging, surprising, frustrating, and ultimately rewarding" for educators (Kolb, Kolb, Passarelli & Sharma, 2014, p. 205). The author has found agreement with this statement and will share specific experiences and lessons found while implementing larger scoped experiential projects into undergraduate marketing classes.

Over ten consecutive fall semesters, my Integrated Marketing Communications (IMC) class teamed with students from the college's Art Department to form IMC "consulting firms" to work with local businesses with a focus of positively impacting the clients' sales and other marketing objectives. The students from my class formed 3-4 person marketing teams and were then joined by 1 or 2 "creatives" from the Art class. Typically, the number of total teams ranged from 5 to 7 per each fall semester. By the end of the semester, the client was presented a custom IMC plan, as well as, an array of creative materials designed especially for their plan.

Although undertaking such an experiential learning experience seemed like a good idea from the start, I had little idea how positively it would be accepted by students and the greater business community surrounding the university.

This article contributes to related literature in several ways. First, a process of integrating a semester-long experiential learning project with actual business clients is detailed. Second, a multi-stage process to increase the accountability and widespread participation of individual students in experiential team projects is offered. Finally, information is offered as to how an experiential learning project can integrate business students with non-business students to enhance student experience related to working in broad functional teams.

LITERATURE REVIEW

Experiential learning is an environment that brings students into a situation where they, as learners, participate in an active manner in the acquisition of information and knowledge (Cannon & Feinstein, 2005) with the pedagogical objective of linking learned theory with practice (Perrin, 2014). Austin and Rust (2015) stated that experiential learning is by nature hands-on learning that can be provided by numerous methodologies including projects, internships, co-ops, study abroad and experiential activities.

An objective of using experiential learning by educators is to improve student learning of knowledge and skills (Green & Farazmand, 2012) as experiential learning moves students into a more engaged state in the learning process (Wharton & Parry, 2003). Kolb and Kolb (2005) found that many educational programs are more focused on a more memorization learning style than programs that also allow learners opportunities to learn by putting what has been learned into action via an experiential learning component. Research by Maher and Hughner (2005) showed students evaluate experiential learning in a favorable manner. Experiential learning activities with real clients give students significant opportunity to try out their communication skills as well as learn by doing (Hagan, 2012). Sanchez-Romaguera and Phillips (2018) identified the benefits to students of experiential education include a higher level of problem solving and an increased ownership of responsibility for their own learning.

Four overall routes to management learning can be identified: action, cognition, reflection and experience (Kayes, 2002). Zull (2002) found that the learning cycle can be more fully completed when learning through internal reflection is brought into contact with experiences. Benefits for students from experiential learning include higher student intellectual achievements (Knobloch, 2003). Research by Warnick, Schmidt and Bowden (2014) showed experiential learning is an effective route to the development of student cognitive skills. While increasing the relevancy of content, experiential learning also promotes student critical thinking, problem solving and decision-making (Hodge, Proudford & Holt, 2014) and can provide students the chance to apply, integrate and build their knowledge (Bristow, Harris, Gulati & Schneider, 2014).

Research also shows that the benefits of experiential learning are varied and go beyond student intellectual achievement. Experiential learning projects increase the self-confidence of many participants (Charlebois & Giberson, 2009) and students feel increased confidence and optimism regarding the quality of their work (Cano, Lidon, Rebollar, Roman & Saenz, 2006). Students often show significant levels of involvement in experiential projects (Elam & Spotts, 2004). In an environment of increased competition for students, colleges and universities can positively differentiate themselves from many institutions by offering relevant experiential learning opportunities may provide a positive differentiation between institutions (Roberts, 2018).

Experiential learning has been found to have "a positive, significant effect on student learning and student's perception of learning" (Burch et al, 2014, p. 282) including increased student interest in life-long learning (Jiusto & DiBiasio, 2006). Baird (2018) found that students often described immersive experiential learning opportunities as transformative. Quesada-Pineda, Adams and Hammett (2017) identified that students in programs featuring a combination of teacher-centered and experiential learning felt engaged, empowered and could apply their experiences in different situations and contexts while Karimova

and Rutti (2018) found that the combination of lectures and experiential learning assisted students in applying classroom topics to actual business environments. Experiential learning with real clients in an international setting has been found to provide a higher level of student understanding of their work process and results, their prospective professions and the international settings (Vaz & Pedersen, 2002).

Austin and Rust's (2015) study of a university experiential course program found that while engaging students in their learning, faculty are engaged in their teaching. Austin and Rust further stated that experiential learning programs can have a positive impact on campus's overall learning culture.

METHODOLOGY

While teaching marketing in a school of business at a university in the Northwest United States, I began integrating an experiential project into a junior/senior level undergraduate Integrated Marketing Communications (IMC) course. Teaming with the Digital Imaging undergraduate course from the university's Art Department, student teams were formed to create "promotional agencies". Each student promotional agency worked with an actual local small business. Students in the IMC classes assumed account management duties that dealt with researching the client firms, customers, competitors and marketing efforts and then developing customized integrated marketing communications plans. Students in the Digital Imaging classes developed the actual creative outputs such as print advertisements, promotional materials, web site mock-ups (actual websites were not developed as part of this project), point of purchase materials and sales promotion pieces. The entire project took approximately 12 of the semester's 14 weeks and ended with teams presenting the formal IMC plans and creative deliverables to their clients.

The timeline and process for this project had several stages that stretched across the semester. First, the project was detailed to students and then students self-selected into IMC teams. Next after instructor pre-approval of prospective clients, each team was responsible for securing their own business. Third, student teams analyzed the client's previous marketing related efforts, customers and competition and then developed specific IMC strategies, tactics and budgets. At this point and based on the IMC plan developed by account management, the creative team developed the actual IMC pieces. At the conclusion of the semester, the integrated teams presented their plans and creative output to the clients through a visual presentation and hardcopy of the entire IMC plan including schedules and budgets.

RESULTS AND LESSONS LEARNED

This experiential learning group project presented benefits, and also challenges, for the students, faculty and businesses involved. The challenges within groups will be discussed in additional detail later in this section.

A common student reaction when the project was introduced to the class at the beginning of the semester was "how do we know enough about IMC to be able to help a real business?". However, by the end of the semester students came to appreciate that their IMC plans were relevant, useful, appreciated and valued by their clients. The resulting benefits to students came from 5 main areas: (1) students gained experience in the "real" business world; (2) students gained confidence in their professional skills; (3) students gained confidence from realizing the information gained through business classes could be actually relevant and useful to their professional lives; (4) students gained experience in working in cross-functional groups; and, (5) students gained experience worthy of including on their resumes – and students reported prospective internship providers and/or employers often favorable commented on this project.

There were also several significant benefits from the faculty perspective including (1) students learned from their peers through working together and critiquing and developing each other's work; (2) students tended to take the project very seriously – much more so than with case studies, fictional scenarios, etc. – due to working for real-world clients; and, (3) students gained significant experience in analyzing situations and then developing appropriate turn-key recommendations appropriate for client budgets and customers.

This type of experiential learning also presented challenges to students within individual teams. The challenges from the student perspective fell into two main categories. First, and similar to other types of team assignments, students found that some of their teammates did not participate equally. To promote more consistent student involvement within teams, I developed a grading procedure that involved peer grading within each student team across multiple stages of the project that could result in different grades for students in the same group. An example of how this was done was to ask students in every group to divide 100 points among group members based on productivity and quality of work of the assigned portion of the project. The hope from the instructor's point of view would be for each student to get the same amount of points (e.g., 25 points each if 4 members were one the team, 20 for a 5-person team, etc.). If there was a significant difference among the scores groups would be notified of the situation and tasked to an agreement of the percentage each member earned on the assignment's grade.

For example, a group earned 86/100 points on a portion of the project but peer grading indicated significant differences in how much each student did as well as the quality of work done. Before informing the team the grade on the assignment, the team had to come to a collective agreement – with all signing off – on what percentage each member would receive based on each student's performance. For this scenario, let's say there was agreement within the team that 3 students earned 100% and a student who did less work an 80%. Therefore, the students would receive scores of 86, 86, 86 and 68.4 respectively. Overall students received this grading system well as grades better reflected the actual quality and quantity of individual student contributions to the assignment.

Another challenge for some student groups was that this project required planning and preparation. The importance of time management came into focus as some aspects of the project – like meeting with clients and group members – did not lend themselves well to last minute "cramming" and writing reports the night before the due date.

The most significant faculty challenge revolved around the additional time and energy needed to have a class undertake such an experiential project. Often being their first type of such assignment, students ask more questions and request insights and guidance. Reviewing and grading segments of the project early in the semester took more time as students were less familiar with business report style writing (though that had been covered in class with multiple examples provided on the class online management site). Finally, many students needed encouragement and guidance related to analyzing an aspect of the client's marketing efforts and then developing custom, detailed recommendations for improvement of the area.

The main challenge expressed by client businesses was the carving out the time to meet with IMC teams. However, the consensus was that the time for those meetings were well worth the benefits of receiving the IMC Plan and supporting materials for their businesses.

ASSESSMENT

While no business client actually implemented an entire IMC plan, it was common for numerous recommendations from plans to be adopted. In fact, in multiple occasions, clients began implementing marketing strategies and tactics being developed the student teams prior to the project's completion and submission.

Client post-project feedback regularly mentioned the quality of analysis and resulting recommendations and creative work. Clients frequently said that they were so occupied with day-to-day operations that they did not have time or energy to devote to such detailed planning.

Client views of the this experiential learning experience were manifested in additional ways including (A) no client ever expressed regret in working with the students or the marketing plans; (B) the number of previous clients wanting to work with student teams again after a couple of years was high enough that a "3 year between client renewals" policy was developed so more businesses in the area could benefit from the student work; (C) positive word-of-mouth from the client business' was such that local firms started to contact the instructor in order to get on the future client list; and (D) several clients retained members of their student teams post-project in (usually paid) marketing intern positions to implement the marketing plans that the teams developed.

CONCLUDING COMMENTS

I have found integrating extended experiential projects where students work with real business clients into classes time consuming and sometimes a hassle – especially when sorting out group dynamics was necessary. However, I am confident the benefits to the students worth such inconveniences. Perhaps the best judgment of these extended experiential projects came from the students themselves years after graduation as it is not uncommon for former students to let me know that looking back they found the group IMC Plan project engaging, memorable, relevant and valuable.

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FACTOR THAT IMPACT ATTRITION AND RETENTION RATES AMONG ACCOUNTANCY DIPLOMA STUDENTS: EVIDENCE FROM SAUDI ARABIA

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ABSTRACT

Studies to current day that examined dropout factors at higher education institutions has inclined to emphasis on groups of factors which may or may not influence college dropout. Also such studies are mainly focused on one-institution. This study expands the current literature and developed a model to assess attrition. Three essential groups of factors which influence dropout are acquired into the model. These are external factors, internal faculty factors, and demographic factors. The model was then tried on diploma accounting students and departmental heads of community colleges that offering accountancy diploma programs in Saudi Arabia. The model recognized numerous impacting factors from the three essential groups. Acceptable clarifications were also accessible as to why additional factors were not found to be important, in this specific challenging environment. The model is also helpful in that it offer an opportunity to assess whether some factors are more significant than others in impacting dropout rates in any specific setting. The outcomes are also important in that the model proves the tendency for factors impacting dropout are vary from institution to institution. The outcomes also exposed some arguments between the reasons specified by students and administrators as to the causes of dropout. The model can be tried in other countries and other setting (universities) not just community colleges settings.

INTRODUCTION

Accounting education underpins the whole accounting profession (Wilkerson Jr. 2010). According to Diamond (2005) accounting programs taught inside business schools supply a substantial amount of students entering the profession. This implies the profession is heavily reliant upon accounting programs to produce trainee accountants Currently, there is a lot of negative publicity surrounding the profession (Lampe and Garcia, 2013, and Sullivan, 2006). Similarly, Gerstein and Friedman (2013), Gordon (2011) Rogers, Dillard and Yuthas (2005) stated that the accounting profession's appearance and reputation are based upon it being seen to act with the "highest sense of integrity". *Enron* and other accounting scandals have contributed to the accounting profession's bad image and loss of public trust in the profession. This has led to a reduction in students considering majoring in accounting (Hung, 2014, Heiat and Brown, 2007). The demand for accounting trainees has however increased in recent years. This high demand can be attributed in part to the shortage of accounting graduates. This argument is supported by Campbell *et al*. (2013), Wessels and Sumner (2013) and accounting governing bodies. The American Institute of Certified Public Accountants (AICPA, 2004), noted that corporate and lawful environments should be inspiring the

growth of the accounting profession. This is because the supply of competent accountants is insufficient to meet the current demand. Similarly, Fielding (2005) noted a UK research study by Robert Half International (RHI, 2001) which discovered that 40% of accountants stated that their accounting firm had finds difficulty in employing staff with the accurate accounting abilities, to fulfil their increased workload.

In Australia, difficulty in recruiting competent accountants is also noted by Certified Public Accountant Australia (CPA, 2011), and the Institute of Public Accountant Australia (IPA, 2007). According to Marne and Flood (2005), Jackling and Calero (2006), and French and Capage (2011) in Australia and other developed countries around the world the demand for business studies has increased, but the number of accounting graduates has decreased. The literature suggested that different factors contributing to higher dropout rates in community colleges. Meanwhile, a white paper commissioned by the American Accounting Association (AAA, 2000) revealed disturbing news for the accounting profession. The report stated that both capacity and value at accounting faculties in community colleges were experiencing major decreases. Currently all universities and colleges are working to develop retention strategies, not only for accounting but for all majors. For example Griffith University, Australia in 2013 developed a 'student's success program' to assist students achieving success at University.

King Saud University was the first university opened in Saudi Arabia. It was founded in 1957 in the capital city of Riyadh. Currently, the university is the biggest in Saudi Arabia. King Saud University has 13 colleges, and more than 100,000 students enrolled between the 2001 and 2011 Academic years. Also, the university has other branches in other cities (Education Encyclopaedia, 2012). King Abdul-Aziz University was created in 1967 and is the second largest university in Saudi Arabia. It was established in the city of Jeddah. Previously the university had branches in Madinah and Macca. However these branches became independent universities (Umm Al-Qura University and Taiba University) in 1981 and 2003 respectively. The programs offered are comparable to those programs offered by King Saud University but the university is well known for its excellence in science, medicine, economics, humanities, and engineering programs. The University has nine colleges and more than 61,323 students enrolled between 2001-2011 (Education Encyclopedia, 2012). King Fahd University of Petroleum and Minerals was created in 1963 in the city of Dhahran. It was the first Saudi University to offer programs in energy and the first one to have a centre that specialized in scientific research and innovation. It also offered a one-year orientation English program, and a four-year engineering program in different fields. Only male students were (and still are) admitted and the university has eight colleges with student enrolment of 9,450 students during the 2011-2012 academic year (MOHESaudi. 2012).

In 2003 only eight universities were functioning in Saudi Arabia. Since that time 100 more universities and colleges have been established and the annual budget for higher education in Saudi Arabia has increased to $USD15 billion, for 23 million citizens (Romani, 2009, Baki 2004). The country has built about 56 colleges and universities, specialized in certain fields such as education, medicine and technology. It has also set up about 70 centres to train students in the fields of agriculture, commerce, and technical education (Baki 2004). The reason for university expansion is due to the belief of the Saudi Government that higher education has an important effect on a society. Also the Saudi society considers university education has great prestige, and undervalues the importance of technical and vocational education (Ramady, and Al-Sahlawi, 2005). The problem of attracting young Saudis to enroll at these colleges still exists. This is due to the belief of many Saudis that these colleges are created only for school leavers and academically weak individuals. This belief is strengthened by employment procedures that, until lately, supported this educational structure, by offering priority employment opportunities in the government sector to university graduates. This therefore makes technical and vocational education less appealing and socially less attractive (Ramady and Al-Sahlawi, 2005).

In the mid-1980s, most of these Universities created community colleges that offered two to three year diploma programs in order to meet the demands of the workforce. The objectives of these colleges are to

ensure that enrolled students receive quality education, equal to other colleges operating around the world. (Saudi Ministry of higher education, 2012). Furthermore; Ramady and Sahlawi (2005), noted that school dropouts and less academically prepared students are more likely to register at these community colleges or at technical colleges, as opposed to Universities. Many Saudis consider college education has a lower standard than universities and therefore they are not recommended. This perception encouraged the government to establish a new employment policy that promotes technical and community college education, in order to meet society expectations in regard to higher education. In summary, college education in Saudi Arabia is becoming more in demand. This has forced the ministry of labor to change their policy as well, to encourage Saudi nationals to enroll in colleges (technical or community colleges) to obtain a degree that enables them to secure a job. This policy called *Saudiation*, by the Saudi Ministry of Labor (SaudiMOL, 2012) implicitly recognizes the need for accounting graduates by the labor market. So community colleges in Saudi Arabia can play a major role in economic development and growth. Issues of college attrition and retention rates therefore need to be addressed. This paper add to the current literature by developing a model that can evaluate attrition rates in community colleges. The paper structured as follow: Literature review, Methodology and data collections, result, concluding comments and limitation

LITERATURE REVIEW

External factors are factors that relate to students' lives outside college. Burgess (2008) identified that these factors can be used as predictors of student dropout rates. Thirteen individual factors have been extracted from the extant literature. Some of these factors are: financial issues, jobs, family problems, physical or emotional challenges, and motivational characteristics. Each of the 13 factors is taken in turn. Initially we consider college (two-year) studies and then we consider university studies which have incorporated these factors. In the US, financial assistance programs are very important in supporting students' admissions to community colleges, especially students belonging to mid to lower socio-economic classes (St. John, Paulsen and Carter, 2005). For these students, college assistance programs offer the money needed to enrol in higher education, and without such programs students from these disadvantaged groups, would not be able to obtain a college education (Dowd and Coury, 2006;, Mendoza, Horton and Mendez, 2012). Furthermore, Nakajima, Dembo and Mossler (2012) and Vieira (2012) note that college fees are a very important factor impacting both attrition and retention rates. Their research found that some students discontinue their studies for a sometime, to seek employment that earns them money, and then they re-enrol to continue their studies. However, in some cases they do not go back to college to continue their studies. This finding is supported by other researchers such as Bynum (2010), who noted how students who receive financial support are more likely to stay in college to complete their degree. Similarly, Clark *et al.* (2012) and Bharath (2009) found that being forced to pay for college was the number one factor that leads college students to dropout. Khan and Osman (2011) discovered that 59% of students enrolled in Dammam community college (Saudi Arabia) said they would withdraw from college due to their financial situations. This was especially true of students enrolled in the evening diploma program. But the King's declaration of 2011, which stated that all Saudi citizens should have access to free education, eliminated this particular drop out factor. Marital status is an additional factor impacting students' attrition. According to Astin (1975) been married during college studies has small impact on college dropout rates for men, but is a significant factor influence dropout rates of female students. Subsequent studies support this finding.

According to Ge (2011) who notes that marriage, de factor and committed relationships in the US play a major role in females' decisions to attend college. In the US marital status is a factor impacting student's attrition, especially for female students (Millar, 2010). According to Millar (2010), college students (two-year) tend to have extra family and marriage responsibilities, compared to four-year college (i.e. university type) students. This can lead to their withdrawal from college. This argument is supported by Tinto, (1993), Stratton, O'Toole and Wetzel (2003) and Urwin *et al*. (2010). Other scholars also noted that the marriage factor is positively associated with attrition (Bean and Metzner, 1985). This suggests that female's students are more concern about family responsibilities than male's students which may impact their decision to

drop out from college. Employment is an additional factor impacting students' attrition. Many scholars stated that getting a job while studying can lead to students' decisions to drop out from college or university. According to Nakajima, Dembo and Mossler (2012) note that in the US engaging in full time employment while attending college full time has a significant influence on college student dropout rates. Full time employed college/university students are less likely to prosper in college/university than students who do not have a job (King and Bannon, 2002; Salisbury *et al.* 2012). According to Cuccaro-Alamin (1997) and Riggert *et al*. (2006) students employed full time are less likely to attain a college or university degree than other students; this because the job takes must of the time for these students.

Personal and family illness is an additional factor impacting students' attrition. A few scholars linked this factor to students' drop out decisions from college or university. According to Roberts, McGill and Hyland (2012) who conducted a study to find out the reasons female students withdraw from college, a number of current and former students specified they had been influenced by severe illness (3.7%) family fatality and illness (7.4%) or pregnancy (7.4%). These factors had forced them to dropout from college. Kelly *et al.* (2007) similarly reported that about 23% of college students withdraw from college for family issues, such as death or illness of a close family member, and pregnancy. This current paper will investigate whether getting sick (self or family member) while studying can force students to dropout from college. Another factor that can impact students' decisions to drop out from college is poor English skills. As this study cover two environments in which English is not the native language, it is considered this can lead to higher attrition rates. This factor becomes a very important issue impacting students enrolled in universities who teach their courses entirely in English and where this is not their native language. In a US study, Bynum (2010) notes that English proficiency programs have definitely influenced students' decisions to stay in college and have encouraged them to remain and obtain their degrees.

In South Africa Brits *et al*. (2011), noted that a certain level of English proficiency, language and competence are important factors for assuring academic achievement. According to Del Vecchio and Guerrero (1995) students should be skilled in English language if it is the language of instruction. They also should be competent enough to ask questions and understand their college instructors. Another factor that can impact a student's decision to drop out from college is racial/ demographic tension. College students enrolling in city colleges may come from different part of the country. Living away from home, especially in Africa can lead to higher attrition rates. According to Pender (2010) who noted that students from under-represented communities in the US (African American, Latinos, and American Indians) have the highest dropout rates compared to other racial groups of students (i.e. white and Asian students). These students fail to continue their studies partly because of insufficient or ineffective tries by colleges to help them improve their educational and social attachment in the college setting (Summers and Hrabowski, 2006). Similarly, Mangan and Trendle (2010) found that in Australia, college attrition rates among indigenous students enrolled at VETs and TAFEs are higher than for other groups of students.

Lack of transportation is an additional factor impacting students' attrition decisions. A few scholars linked this factor to students' dropout decisions from college or university. This factor can impact a student's decision to drop-out and as this study has three different environments, it will be tested in this research to see its relevance. Roberts, McGill and Hyland (2012) found that several characteristics of commuting to university were found to be an issue among female students. The distance between the university and the student's home was an issue for 22% and transportation availability was a problem for 22% as well. The researchers stated that these factors make it hard for students to be completely involved with their education and are more likely to work in combination with other factors, which can lead to increased student attrition. This paper will look how lack of transportation impact student's decision to drop-out from college. Conflict with college authorities is an additional factor impacting students' attrition. This factor may influence students' decisions to drop out of college. This issue is very sensitive and that is why there is no available literature considering it. This study is the first of its kind to link this factor to attrition rates. There is a lack of literature concerning this factor and most attrition research has failed to focus on this issue. This is

possibly due to the fact that most research on attrition has emanated from Academic who views attrition as the "student's" problem, rather than any fault of the institutions.

Also getting information or data needed to investigate this issue it's not easy, so views of Academic and difficulty of collecting data played in this lack of literature. In this paper will therefore investigate this issue to see if there is any evidence that it can impact a student's decision to withdraw from college or suspend their studies. Absence of clear policies is an additional factor impacting students' attrition. This issue is also very sensitive and explains why there is no available literature considering it. This research is the first of its kind to link this factor to attrition rates. As with the previous issue, this factor has not been investigated by many researchers. Again, this could possibly be due to the potential for a negative image to emerge of universities and colleges. It is unlikely colleges and universities are going to admit that their policies are weak and these factors contribute to students' dropping out. Dockery (2012) stated that college dropout issues should be blamed on high school counsellors. He noted high school policies should be focused on this fact, to prevent or at least reduce college dropout ratios. He stated that high school policies should focus on Academic performance and offers extra Academic programs to help students academically by doing so students will perform better at college.

This paper will include the above factor in the devised model to find out if this factor is significant in contributing to college attrition rates. Another factor that can be linked to attrition rate is poor attendance/grades. Prior research demonstrates this factor has a strong influence on student's drop-out decisions. Bean and Metzner (1985) included GPA and its relationship to attrition among college students in their model. Most scholars stated that this factor is more connected to two years colleges than university due to the different educational settings of the two groups. This is observed upon by many scholars (Leone and Tian, 2009; Kinloch, 2012; Mikiko *et al.*, 2012). Another factor which may cause students to drop out is increased interest in other areas of study. Prior research, listed below, linked this issue to high attrition rates. Currently accounting programs facing many challenges such as losing their students to other areas (for example nursing, IT, etc.) and the explosion of interest in information technology; have contributed to increased student interest in other area of studies over accounting. Several studies and reports attest to this. These include AAA (1986) AECC (1990) Arthur Andersen & Co. Perspectives Paper (1989) Frederickson and Pratt (1995) and French and Cappage (2011). Accounting programs requires certain skills that are needed to enter the accounting profession, student's views these skills is challenging and demanding which contribute to their drop-out from accounting program, and enroll in other majors that are less demanding, Kavanagh and Drennan, (2008).

This paper will include the above factor in the devised model to find out if this factor is significant in contributing to college attrition rates. According to Bougen (1994) and Ferreir and Santos (2008) a undesirable opinion of accounting studies seem to be reinforced in the primary year of college education. This is exacerbated when out-dated teaching styles are used to teach accounting. For example, when faculty teach bookkeeping and other quantitative problems, students perceived this as negative because it is viewed as boring due to the way it is taught. This can then impact on the students' decision to continue (or discontinue) their studies in the field of accounting. Another issue students sometime enrolling in program without known what skills the profession requires which also can lead to high attrition rates. Johnston et al (2010), Dewey (1912) Family pressure is another factor that can impact a student's decision to drop out from college. Many researchers wrote about this factor and its influence on attrition rates. Shah and Widin (2010) note that education level of college students' parents is an important factor in determining whether those students persist at college. Parent education levels also play a major role in determining student accomplishment, especially students from lower social class groups (which most community college students belong to). Ishitani (2006) and Whitehead (2012) both note students who are the first person in their family to attend college have higher dropout rates than other students. Similarly, minority group students and students belonging to lower socio-economic classes, demonstrate higher dropout rates. This is supported by other researchers such as Chen *et al.* (2000), Majer (2009) and Savi (2011).

This present paper expands upon previous studies of attrition models by using institutional internal factors as well as external and demographic factors to predict attrition rates. These factors are linked to student engagement in curricular and extra-curricular activities, for example, communication with faculty, involvement in college activities, and interactions with other students. Many researchers have focused on student characteristics regarding attrition. This paper will supplement findings as regards these characteristics but will also investigate students' satisfaction levels regarding their institutions The general importance of these factors is highlighted in the literature in business management which shows that customer satisfaction is very significant in retaining customers. Douglas, McClelland and Davies (2008) conclude that, "the concept of the student as customer is not new". They stated that students should be considered as customers and their approval is significant to their retention. High levels of approval among students will help in increasing college retention rates (Chandler, 2001). According to Petruzzellis and Romanazzi (2010) in Italy, student satisfaction is related to retention and has become a very critical issue for colleges and administration. If students are not pleased, they will send negative messages about the college to others. This will harm the image of the college. Students who will not endorse their college to others create other issues such as engorging other students to drop-out, not paying school fees (Blackmore, Douglas and Barnes, 2006). As Voss (2009) concluded, German student approval increases not only student retention but also the potential enrollment of new students. It is therefore important to know the aims of students. If these aims are fulfilled, then the overall satisfaction level will increase an institution's registration system is a factor, which if students are not satisfied with, can increase the attrition rate.

A few researchers such as Hale and Bray (2011) Andrews (2003) and Angelo (1990) have finished researches that focused on the importance of the college registration system and its influence on dropout and retention rates. The outcomes of these researches found that the college registration system clearly influence dropout and retention rates. Course scheduling/timetabling is another factor that may decrease the satisfaction level of students. If it does, this can also be associated with high attrition rates. According to Douglas, McClelland and Davies (2008) communication with students concerning modification to course timetables and exams has a significant impact on student satisfaction and attrition these due to fact students might have other plans and also this create impact students plan agenda. The authors stated that keeping students notified about course syllabus, instructions, changes in schedules, and paying attention to their comments, enhances student confidence and satisfaction. The college accounting curriculum, as a potential attrition factor, has not been well investigated by researchers.

Most researchers (Allensworth and Nomi, 2009; Harris and Tienda, 2012; LeBeau *et al.*,2012) focus on high school curriculum and its impact on college retention rates. Other researchers (Dorn, 1993 Ibrahim and Brihoum, 2001) propose that college curriculum must be reviewed regularly to ensure they remain relevant to the requirements and demands of the industry. Course assessment (exam grading, assignments, etc.) is another factor that many researchers investigated, which also can be linked to attrition. According to Bahr (2012) students who do not pass their course the first time are unlikely to enrol again in that course. Other researchers such as Bailey (2009) have also noted that course assessment impacts college attrition, students who getting bad grades in exams are more likely will not enrol in the same course again, this can impact course attrition rate. Bailey, Jeong and Cho (2010) supported the above argument Teaching and college instructors are another internal factor that can be linked to attrition. Many researchers find this factor is highly associated with college attrition. The teacher-student relationship has a major impact on students' satisfaction levels and retention decisions (Khan and Osman, 2011). The extant literature notes that 'faculty-student collaboration" is a predictor of student attrition (Pascarella and Terenzini, 1991). Tinto (1975) agreed that increased collaboration between students and faculty supports the ties between students and their college and helps in decreasing student attrition rates.

Another factor which may impact attrition is college facilities. This factor may not have been investigated sufficiently by others. Lau (2003) stated that course instructors can aid to keep constructive learning environment for their students by using multimedia tools and creative instructional techniques such as

cooperative and collaborative learning in their classroom which can help to reduce attrition rate. An additional factor which may impact attrition is technology. Many researchers have investigated this factor and its impact on college attrition. The extant literature is inconclusive regarding the connection between student satisfaction, the utilization of technology in higher education, and their relationship, if any, to student attrition rates. Green and Gilbert (1995) supported the opinion that utilization of information technology improves the learning progression among college students. This can lead to better retention rates. Roy and Elfner (2002) and Khan and Osman (2011) reviewed the benefits of utilizing technology in the classroom. Both studies noted the use of several IT instruments such smart board and module, webtv can be valuable in the student learning process and improves their satisfaction levels. College services are an additional factor that may impact college attrition. Many researchers find that this factor is highly associated with college attrition. According to Noel *et al.* (1985) counseling and advising have a significant positive impact on student satisfaction and therefore retention rates. The authors believe that employment preparation, and counseling and advising services by a college are crucial factors in student retention.

Harvey-Smith (2002) notes that the accessibility of student services provided by the college can have a huge impact on student's persistence and retention decisions. The author also notes that students' involvement in student unions, as well as their participation in college activities, will help in increasing retention rates. Another area which has not received much focus is the relationship between use of college facilities and student retention rates. Mallinckrodt and Sedlacek (2009) tested this in the US and discovered that the use of college facilities is indeed positively connected to students' retention rates. Also the authors noted that use of the library is positively related to retention as well. Their research concluded that the use of non-academic facilities such as GYM, sport facilities was a particularly important factor that impacted attrition decisions, especially for African American students. According to Windschitl (2008) and Fenzel (2001) both found that several of the activities that help to maintain a healthy lifestyle also have a positive influence on college retention rates.

According to Roberts and Styron (2010) and Pascarella and Terenzini (2005), note that many educational institutions offer their students different types of academic services and resources in order to enhance the chances of retaining them. Miller (2005) and Seidman (2005b) argued that if students are admitted to an institution, then the institution should provide services that will assist these students to succeed. The seven demographic factors included in this research are as follows: age, marital status, geographic location/nationality, year of study, computer skills, and reasons for choosing an accounting program, and willingness to encourage others to major in accounting. Some of these factors have been evaluated in previous studies. Others however, it is argued, need more attention and so are included in this updated model used to assist in evaluating factors impacting attrition decisions. The age factor can impact attrition rates and many researchers have investigated this factor and its impact on attrition. According to Khan and Osman (2011) note that literature which discusses student dropout rates in relation to student age, shows inconsistent results. Some researchers believe that the age factor is directly related to drop out decisions. Cooper (1990) stated that the age factor has a limited yet significant effect on student attrition. Xenos, Pierrakeas and Pintelas (2002) concluded that older students are more likely to drop out than younger ones. Hoyt and Winn (2004) reported that both stop outs (temporary withdrawals) and drop outs were likely to be older students with children Anionwu *et al.* (2005) commented that young students are less likely to finish their studies. Marital status is an additional factor that can impact attrition. Many researchers have investigated this factor and its impact on college attrition.

According to Bradburn (2002) tested the characteristics impacting students' withdrawal at two and four-year colleges. His findings showed that around 62 percent of married students drop out from college within a three years period. Geographic location and students' nationality is an additional factor that may impact attrition. Prior research has investigated this factor and its impact on college attrition. A report by the Australian National Audit Office (as cited in Jackling and Keneley 2009), studied 485,983 tertiary students, including 102,868 international students. The study took place in the 2006 academic year across 32

Australian universities. The study investigated student retention rates and the findings showed that 89.5% remained at university, and only 10.5% withdrew. The 89.5% of students who stayed in their course either finished their course or continued their studies from the previous year. 7.6% of the 102,686 international students dropped out which is a lower than the domestic students with an 11.3% drop out rate. Other studies, such as Grebennikov and Shah (2012) similarly found that international students demonstrate better retention rates than local Australian students. Other researchers have also noted that country of origin has been classified as an element which influences students' decisions to choose accounting as an area of study and career (e.g. Mauldin *et al*., 2000 Tan and Laswad, 2006 and Jackling and Keneley, 2009). Years of studies are an additional factor that can impact attrition. Prior research has investigated this factor and its impact on college attrition. A study by Horn (2009) found that after three years of enrolment, forty nine percent of community college students had remained as students.

Reason for choosing the accounting program is an additional factor that can impact attrition. Here again prior research has investigated this factor and its impact on college attrition. According to Uyar, Haydar and Kuzey (2011) investigated the reasons that influence students' career choices in accounting. They began by summarizing the results of earlier studies. Mauldin et al (2000) investigated twelve factors that influenced students' decisions to choose accounting as a college major. These factors are: career opportunities, accounting instructor, money, interest in the subject, parents, enjoyment, pervious experience, life style, challenge, prestige, and usefulness. They found that the accounting instructor was the most significant factor Encouraging others to major in accounting is an additional factor that may impact attrition rates. Not many scholars have investigated this factor and its impact on attrition, so it is included here to test its impact. There is a lack of literature regarding whether students encourage other students to major in accounting and the impact, if any; this has on student retention rates. Studies by Person (2002) and Albert and Sacks (2000) stated that accounting practitioners and educators, if they had to redo their studies, would not choose accounting as their choice of topic.

Based upon the discussions above a model to evaluate the impact of various factors on attrition rates has now been developed. It has been developed from Bean and Metzner's (1985) model, Tinto's (1975) model of student departures, and Astin's (1975) work on student involvement. This model also includes some new variables not previously evaluated. The model identifies three categories of variables which impact upon attrition rates (i) external factors; (ii) internal factors; and (iii) demographic factors. A diagram of the full model is presented on the next page. The model will be tested in three different environments. The first two environments are Sudan and Saudi Arabia, and the third environment is Australia. The model is anticipated to evaluate attrition in these three different environments. It is anticipated, due to the different socio-economic and demographic issues discussed in chapter 2, that in different environments, factors that impact attrition could be different. The overall intention of the model is to show that it can be used as an evaluative tool with which to analyse attrition decisions in different environments. The following chapter will explain how the model will be tested. Hale

METHODOLOGY AND DATA COLLECTION

This paper study uses a mixed methodology approach of both quantitative and qualitative methods. Mixed methods research is well supported by Lieberman (2005), Mertens (2009) and Creswell (2009) as it can supply more extensive results for a specific research problem. Creswell further observed that quantitative and qualitative methods in the fields of social and human sciences are well known, well justified and appropriate. Woolley (2009) and Johnson and Onwuegbuzie (2004) also support mixed methods approaches, claiming they offer an integrated approach to collecting data and can supply numerous viewpoints to the same research questions, based on the above studies mixed methodology is the appropriate one to use in the paper because it can supply extensive result for attrition problem, also its offer numerous viewpoints to the research questions. The researcher travelled to Saudi Arabia on two separate occasions. The first time the researcher spent about five months in 2011, during that time he met with five community

college deans to get their permission to run the survey at their institution. All five deans agreed. All deans allowed the researcher to distribute the questionnaires to their students and program directors. The second time the researcher travelled to Saudi Arabia for about three months in 2012 to meet with an additional four deans from four additional colleges to get their permission to distribute the survey to their students and program directors, all four deans agreed, the researcher was able to visit two of these colleges to distribute and collect the survey from students, and program directors, the other two colleges the program directors distributed and collected the questionnaires from students, and then send to the researcher by post.

The survey instrument was therefore distributed to the accounting/business students and their program directors in nine community colleges in Saudi Arabia that offer a two-year accountancy diploma program. The students completed them during lecture time under the supervision of the researcher and one accounting faculty staff belonging to the college. The institutions included in this research come from two different regions within Saudi Arabia. 6 colleges were from the eastern province and three from the central region of Saudi Arabia. Interviews were also conducted face-to-face with the nine program directors. Actual attrition rates were taken from the universities' records, through the directors, during these interviews. In total, 546 students' questionnaires were collected from the nine colleges and nine administrators' (the program directors) questionnaires. Also, nine interviews were conducted with the program directors. The attrition rates were 28%, 13%, 35%, 5%, 21%, 25%, 29%, 26%, and 23%. The researcher attending accounting lectures and also meeting with program directors during the interviews. They also show the college facilities at some of these Saudi Arabian institutions. The Response rate were 90% from 700 which about 546 students who completed the survey. It is argued that this convenience sampling approach is suitable for this research and resulted in a geographically dispersed and representative sample of Saudi Arabia colleges participating in the study.

RESULTS

Initially two reliability tests were performed. The first test measured the internal consistency of the external factors, and the second measured the internal consistency of the internal factors. Tables 1 and 2 below summarize the outcomes of these tests. All data collected from students and program directors in Saudi Arabia were entered into *SPSS* for analysis. The research consisted of reliability, and the analysis of the mean.

Table 1: Reliability Statistics - External Factors (SA)

External Factors	Scale Mean	Scale Variance	Total Correlation	Cronbach's Alpha
1	42.5730	50.844	0.157	0.706
2	42.6432	49.078	0.288	0.688
3	41.7387	49.359	0.311	0.685
4	41.7802	49.825	0.277	0.689
5	42.1117	47.172	0.400	0.673
6	42.1045	48.556	0.299	0.686
7	42.5333	49.531	0.302	0.686
8	42.2108	47.809	0.317	0.684
9	42.1676	47.981	0.362	0.678
10	41.6937	48.058	0.386	0.675
11	41.6577	48.471	0.368	0.678
12	41.5676	49.690	0.308	0.685
13	42.1550	48.467	0.313	0.684
14	42.0450	49.397	0.324	0.683
Overall				
Cronbach's Alpha	0.70			
N of Items	14			

The Cronbach Alpha for the external factors for all colleges in Saudi is 0.70. Therefore as 70% of the items are measuring the same construct, the percentage is acceptable. This table contains summary data of the reliability of the external factors.

Table 2: Reliability Statistics - Internal Factors (SA)

Internal Factors	Scale Mean	Scale Variance	Total Correlation	Cronbach's Alpha if item deleted
Registration (Process)	121.8703	580.767	0.471	0.93
Registration (Course selection)	122.045	574.747	0.492	0.93
Registration (No Delays)	121.9063	583.338	0.423	0.93
Registration (Warning system)	121.9676	582.587	0.427	0.93
Registration (Announcement)	122.0703	577.08	0.462	0.93
Registration (Overall)	121.9784	579.574	0.495	0.929
Lecture and Exam (Flexibility)	122.0667	574.438	0.473	0.93
Lecture and Exam (Course conflict)	121.6721	584.17	0.394	0.93
Lecture and Exam (Exam conflict)	121.9117	578.438	0.439	0.93
Lecture and Exam (Overall)	121.9532	578.954	0.5	0.929
Curriculum (High Expectation)	121.6865	584.429	0.458	0.93
Curriculum (Transferable)	121.8595	580.125	0.495	0.929
Curriculum (Interesting)	122.0901	582.169	0.461	0.93
Curriculum (Contents)	122.1045	576.17	0.559	0.929
Curriculum (Overall)	121.8306	580.459	0.54	0.929
Exam and Feedback (Criteria)	121.8468	583.029	0.452	0.93
Exam and Feedback (Feedback)	121.7874	589.077	0.413	0.93
Exam and Feedback (Overall)	121.8234	586.615	0.411	0.93
Teaching Satisfaction (Knowledge)	121.5351	584.592	0.473	0.93
Teaching Satisfaction (Availability)	121.8324	579.981	0.516	0.93
Teaching Satisfaction (Cares)	121.7532	577.381	0.542	0.93
Teaching Satisfaction (Style)	121.9333	577.979	0.56	0.93
Teaching Satisfaction (Overall)	121.9153	579.446	0.507	0.929
Facilities (Computer lab)	122.1081	569.505	0.567	0.929
Facilities (Teaching facilities)	122.2216	570.444	0.583	0.929
Facilities (Class Size)	122.1207	578.384	0.485	0.93
Facilities (Overall)	122.2468	571.652	0.575	0.929
Technology Used (E-mail account)	122.0613	574.722	0.545	0.929
Technology Used (Support)	122.2252	572.951	0.605	0.928
Technology Used (Facility)	122.3387	576.903	0.582	0.929
Technology Used (Overall)	122.2811	571.394	0.6	0.928
Service (Learning resources)	122.0234	572.243	0.605	0.928
Service (Bookstore)	122.3676	576.421	0.512	0.929
Service (Gym-Health facilities)	122.5333	573.61	0.532	0.929
Service (Support services)	122.3027	572.67	0.585	0.929
Service (Careers services)	122.027	575.748	0.599	0.929
Service (Overall)	122.1027	568.605	0.374	0.933
Overall Cronbach's Alpha	0.933			
N of Items	38			

Note: This table contains summary data of the reliability of all internal factors.

The result of the reliability factor analysis of the internal factors provides a satisfactory measure when compared to Nunnally's (1967) benchmark. The result implies 93.3% of the items are measuring the same construct.

Table 3: Students' Rankings of Importance of External Factors (EX)

External Factors	Mean	STDV
EX 12: Interest in other major	3.7308	1.0591
EX 11: Loss interest	3.6410	1.1118
EX 10: Academic	3.5934	1.1315
EX 3: Job	3.5568	1.1044
EX 4: personal and family sickness	3.5403	1.1051
EX 14: Other	3.2692	1.0660
EX 5: No transport	3.2125	1.2125
EX 6: English Lang	3.2051	1.2525
EX 9: Absence of policy	3.1648	1.1756
EX 13: Family Pressures	3.1429	1.2406
EX 8: Issues with Administration	3.1026	1.3218
EX 7 :Demographic reason	2.7656	1.0937
EX 1: Financial	2.7509	1.2880
EX 2: Marriage	2.6575	1.2122

Notes: This table presents the mean and the standard deviation for external factors, the table also shows the most effective external factors that influence attrition to less effective factors, according to student's opinion in all colleges in Saudi Arabia.

H1SA: External Factors Will Impact Attrition Rates of Accountancy Programs

The first analysis of means and independent sample t-tests were used to test hypothesis 1, whether external factors contribute to attrition in Saudi Arabia. The students were asked if the listed external factors would force them to terminate their accounting studies. The constructed measurement started with 1 (strongly disagree) and ended with 5 (strongly agree) on the 5-point Likert scale. Therefore, all factors with means greater than 3.0 are considered to impact upon attrition. Based upon the students' responses it is valid to conclude that in Saudi Arabia 11 of the 14 external factors appear to positively impact attrition. In order of importance these are: increasing interest in other majors, losing interest in studying accounting, academic performance, getting a job, personal and family sickness, lack of transportation, English language, and absences of clear policy, family pressures, issues with the administration and "other reasons". The open ended "other reasons" question offered the following issue as impacting attrition: having to leave community college due to difficulty of transferring to the bachelor programs at a university. Another reason the students stated was the lack of a monthly allowance. This is offered to students enrolled in university only, not to students enrolled in community colleges. These results tend to indicate that external factors identified in previous literature do indeed affect attrition rates in Saudi Arabia, but some factors appear to have more influence on attrition than others.

Table 4: Students and Administrators Satisfaction with Internal Factors

Factors Clusters	Students		Administrators	
	Means	STDV	Means	STDV
GrandTech (Average of Technology sub-factors)	3.1502	0.96872	4.5833	0.53033
Grandserv (Average of college services sub- factors)	3.1511	0.97450	4.5556	0.44876
Grandfacility (Average of facilities sub-factors)	3.2010	1.09377	4.7222	0.42287
GrandReg (Average of registration sub-factors)	3.4063	0.87123	4.6852	0.35789
Grandcur (Average of curriculum sub-factors)	3.4659	0.82940	4.6889	0.47022
GrandLectur (Average of lecture-scheduling sub-factors)	3.4794	0.98132	4.6944	0.46398
GrandExam (Average of examinations sub-factors)	3.5592	0.84028	4.8889	0.33333
GrandTeaching (Average of teaching sub-factors)	3.5868	0.86054	4.7778	0.36667

Notes: This table presents the mean and standard deviation of the total of each internal factor cluster, and the difference between students and administers.

H2A: Institutional Internal Factors Will Impact Attrition Rates of Accountancy Programs

Students were asked how satisfied they were with the listed internal factors. As per the Sudanese results, the constructed measurement started with 1 (strongly dissatisfied) and ended with 5 (strongly satisfied).

Hence, rather than cutting off at the midpoint of 3.0 and evaluating whether or not the factors impacted attrition (as with the external factors), just like Sudan an alternative analysis methodology was selected.

Therefore, this time when analyzing the scores on the 1 to 5 scale, factors with lower means (explained below) were deemed to impact attrition, without using a specific cut-off point the purpose with the internal factors was to evaluate which factors would have the greater influence upon a decision to terminate accounting studies. The questionnaire contained 8 *internal* factor clusters: registration, scheduling of lecture and examination, curriculum, grading, teaching, facilities, technology, and college services. These were then further sub-divided into 37 sub-factors. As stated above the lower the mean, the greater the dissatisfaction and therefore, the greater the propensity to quit accounting studies. Three factors appear to have the strongest influence based on the student's responses. These are: the lack of technology, standard of college services, and standard of college facilities.

Internal factor means in ascending order, as classified by students, and then lists the program administrators' means alongside. Both groups did not concur in the order of the factors noted above. Furthermore, from the students' responses the first three means are very close (3.15 to 3.20) and then there is a gap to the remaining five means (3.40 to 3.58). For the administrators the difference is even more pronounced. The first two means (4.55-4.58) are close in range while the remaining six range from (4.68 to 4.88). The first three factors therefore appear to be contributing more to attrition than the other five internal factors. Students appear less happy with technology, college facilities and college services. These are viewed as more likely contributors to attrition than the other remaining internal factors, (scheduling of lecture/examination, curriculum, and registration, grading, and teaching). This is because the first two of the three were ranked by both administrators and students as the most likely to cause dissatisfaction and the third factor was ranked by the students at almost the same unsatisfactory level as the first two. Therefore, H2 is accepted. Let us now consider H3.

H3SA: Demographic Factors Will Impact Attrition Rates of Accountancy Programs

The first two demographic factors to be assessed were age and marital status. Previous studies, as mentioned above had found this to be significant factors impacting upon attrition decisions. Table 5.11 provides the raw data distribution of the participants. In the current sample of the nine colleges in Saudi, the result was significant enough to assess the participant's attitudes and their attrition decisions. As regards age, of the 546 respondents, 71.8% are in the 21-25 years of age, 23.6% are in the 17-20, and 4.6% are in the 26-30 categories. The number of students above 21 years of age totaled 417 (392 aged 21-25, and 25 aged 26-30). This combined percentage of 76.4% can be compared to the 23.6% of students aged 17-20. The age factor then reveals a significant impact on four of the external factors (English language, issues with administration, absence of clear policy, and loss interest in studying accounting

A further analysis concerning these factors shows that a significant number of students above age 21 have different attitudes towards the strength of the impact of these external factors than younger students. 33% of students aged 21-30 stated that English language and issues with administration could force them to leave college. Comparable figures for students aged under 21 were 9% and 7% respectively. Similarly, 29% and 49% respectively of students aged 21 and above stated that the absence of a clear policy and loss of interest in accounting could force them to leave their college. These figures fell to 6% and 11% respectively of students under 21 years of age. These results suggest that older students are more likely to drop out of accounting programs as compared with students less than 21 years of age. A further demographic factor, level of computer skills, impacted three of the external factors. These are; factor one (financial), factor 2 (marriage), and factor 5 (English language). So, we conclude that computer skills have influenced students' decisions to leave college. When we considering marital status, the data showed that 100% of students who completed the survey were single, and therefore there was not a significant enough spread of participants in this category to assess its impact or otherwise upon attrition decisions. For culturally specific reasons,

another significant demographic detail, gender was omitted from the study. To comply with universities' policies, administrators asked the researchers to remove gender from the questionnaire. Two other demographic variables, reason for choosing accountancy as a field of study and whether the participant would encourage others to commence accounting studies, were subjected to ANOVAs to evaluate any significant differences in relation to the evaluation of the 14 external factors. In both instances only two factors were noted as having significantly different results and it was a different factor in each instance. Hence, these are deemed not to have provided evidence of impacting attrition decision-making in this setting. A review of the raw data and responses to open ended questions offers further support to the concept of demographic factors influencing attrition decisions. Referring to question 8; the participants were asked whether they would recommend the accounting program to friends/family and to expand on their answer. The majority (82% - this explains the mean of 1.151, as the construct was 1 = yes and 2 = no) said they would. The main reasons they gave were, (i) more jobs in accountancy, (ii) a diploma will guarantee access to university abroad, and (iii) free education. These reasons support the results earlier identified, where students considered the external factor 'cost of education' would have no impact on their decision to drop out, but 'job opportunities 'did have a significant impact on their attrition decisions. This demographic factor, attitude towards recommending accountancy to others, therefore, appears to not impact attrition decision making. H3 can therefore be said to be supported, as three of the eight factors (age, level of computer skills and years of study) impact attrition decision making. The specific population tested in this setting precluded testing of some traditional variables (marital status and gender) which the majority of studies have found to impact attrition.

The interaction of demographic and external factors noted above highlights the complexity of attempting to evaluate attrition from accountancy courses overall. For example, the actual attrition rates for the nine colleges reveal colleges 2 and 4 have the lowest rates (13% and 5%, respectively) as opposed to the other seven colleges. College 1 has an attrition rate of 28%, college 3 has 35%, college 5 has 21%, college 6 has 25% and colleges 7, 8, and 9 have 29%, 26%, and 23% respectively. Four *external* factors which showed a difference between the colleges were marriage (external factor 2), English skills (external factor 6), issues with college administration (external factor 8), and academic performance (external factor 10). College 2 had significantly lower mean, than other colleges in three out of the four cases, while college 4 had lower means than other colleges for 2 of the 4 factors. Finally, the college with the third lowest rate, college 5, had the lowest mean in two cases. These factors indicate students at these three colleges were less worried about these factors and so their lower attrition rate makes sense intuitively. However, when the ratings for the internal factors, summarized by category are investigated, they reveal the means for colleges 6, 7 and 9 are actually lower than other colleges. This would suggest colleges 6, 7 and 9 students are more dissatisfied with their institutions but based upon the attrition figures they are less likely to leave their college. This suggests that external factors are more influential in a student's decision to leave the college than the internal factors. On further analysis colleges 6, 7, and 9 were found to be government institutions attracting less academically prepared students, and students enrolled there are not offered monthly financial rewards. Colleges 1, 3, and 5 also are government institutions, but students enrolled there are happier with their college than students enrolled in colleges 6, 7, and 9. Colleges 2 and 4 offer monthly financial rewards to their students. This may explain why colleges 2 and 4 have lower attrition rates than other colleges. This is a unique characteristic of the Saudi Arabian situation, differing financial benefits per institution, highlighting the problem of evaluating attrition issues.

Therefore, in summary, to this point, some traditional demographic factors could not be assessed and so only three demographic factors provided evidence of impact upon evaluation of attrition factors, and they are, age, level of computer skills and years of study. This result showed that indeed demographic factors impact the students' decision to leave college, and therefore H3 would be accepted. Let us now consider H4. Based upon the fourth hypothesis, it was anticipated there would be no significant differences between the participants of the nine institutions in their attitudes towards attrition factors. The data to evaluate this prediction. Considering the external factors firstly, factors evaluated. The significance levels when

independent t-tests were performed comparing the mean scores of the nine individual colleges. Only four of the 14 revealed differences. Students at college 7 differed from all other colleges in terms of how much influence 'marriage' (external factor 2) would have on their decision to leave the college. Students in colleges 1, 2,4,7,8 and 9 stated that English language skill levels (external factor 6) could force them to leave college. This factor was far more significant than noted by students at colleges 3, 5 and 6. Students at colleges 5, 6, 7 and 9 were more inclined than students at other colleges to consider issues with college administration would force them to leave the college. Students in all colleges (all means greater than 3.0) stated that their academic performance could force them to leave their colleges. The rest of the external factors demonstrated no significant differences in attitudes between colleges. Similarly, the overall means of combined external factors, row number 64, did not differ significantly (column 13 to 17). So, when considering the *external* factors, support exists for H4.

However, when the internal factors are considered, significant differences emerge. The means for the 37 internal sub-factors (extracted from the 8 internal cluster factors as listed in rows number 18 to 54), 31 reveal significant differences (at the .10 level or below) with only 6 revealing non-significant results, as per column 13. Similarly, the eight combined sub-internal factor means, listed at rows number 65 to 72 also reveal six significant differences (at the .10 level or below). So, when considering the *internal* factors, H4 must be rejected. It appears there are significant differences between institutions from the same geographical location (Saudi Arabia), as to factors impacting student satisfaction, and ultimately therefore, decisions to terminate their accounting studies. Significant differences of opinion exist among students in Saudi Arabia, therefore H4 is rejected. Let us now consider H5.

H5Sa: There will be no difference between the attitudes of students and administrators as to the impact of influencing factors, on attrition rates of accountancy programs

Based upon the fifth hypothesis, it was anticipated there would be no significant differences between students and administrators in their attitudes towards attrition factors. Considering the external factors firstly, table 5.19 demonstrates significant differences in attitudes between the administrators and the students in 4 of the 14 comparisons Administrators considered marriage (external factor 2) would have more weight on students' decisions to drop out of college than students themselves thought. Students believe English skills factors and issues with college administrators contribute more to their decision to leave college than administrators. Finally, administrators are more concerned about students' academic performance and they consider this factor strongly contributes to the students' decision to withdraw from college. Students agree it is a significant factor, but it does not influence their decision to leave as strongly as the administrators think. Focusing on the internal factors, Table 5.20 demonstrates significant differences in attitudes between the administrators and the students in 6 of the 8 comparisons Students were significantly less satisfied with the registration/administration systems, lectures scheduling, exam and grading, teaching, facilities and service quality (internal factors 1, 2, 4, 5, 6 and 8) than the administrators considered they would be. Conversely, students were significantly more satisfied with course curriculum (internal factor 3) and technological issues (internal factor 7) than the administrators considered they would be.

CONCLUDING COMMENTS

Eleven factors were found to impact attrition in Saudi Arabia. These factors are; increasing interest in other majors, losing interest in studying accounting, academic factors, getting a job, personal and family sickness, "other reasons" (such as no financial rewards for community college students), lack of transportation, English language, absences of clear policy, issues with college administration, and family pressures. These results were also anticipated. Considering the first two factors (increasing interest in other majors, and losing interest in studying accounting) these suggest that students find accounting courses boring and not interesting enough for them to stay. The researcher met with many of these students and they stated that the

way the accounting course is taught is not interesting. As regards the curriculum, students appear satisfied with accounting courses, but when we look at their evaluation of the internal factor 'teaching', students are not happy. Hence it appears they are dissatisfied with the way the accounting courses are taught rather than the actual content. The methodology used in this research were mixed approach to analyze the questionnaires, the paper also finds out attrition and retention issues is very important and need to be studied further. Finally, we found that indeed some External and Internal factors impact attrition in retention rates for accountancy diploma students in Saudi Arabia

Limitations

The data disturbed to male students only if the survey distributed to female students that may have impact on the results. Future research maybe needed and to include female and male Students.

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MOBILE MARKETING STRATEGIES FOR EDUCATIONAL PROGRAMS

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ABSTRACT

Today's wireless mobile devices have changed how the world behaves and how education is distributed and promoted. The research reviewed mobile marketing through promotion and place of educational programs to understand how brands are behaving and the effect on consumers. The authors considered the following two questions: In what ways does mobile marketing deliver value to customers? How is mobile marketing used to differentiate the brand? The authors identified a select set of educational organizations who were providing similar services based on their websites at the time. The authors, learned about a range of examples on how mobile marketing can be utilized to promote and distribute educational information services. The authors assessed what contributed in providing value to the user. The criteria the authors assessed were: satisfaction, learnability, accessibility, efficiency and usability. A list of which websites have the most impact on the mobile screen is provided. A suggested model for degree of optimization includes four levels of mobile marketing progression: PC computer-based, progressing, partially optimized, and fully optimized.

INTRODUCTION

The radical shift in the ways people access the Internet via mobile devices has dramatically changed the ways that marketers choose to reach their target markets. In 2018, mobile ads will capture more than a third of total US Media Ad Spend, surpassing TV for the first time. By 2022, mobile's advertising share will be at 47.9% (eMarketer, 2018). It is predicted that nearly 70% of digital advertising will go to mobile formats.

In 2017, 42.4% of North American webpage views were accessed using a mobile device. World-wide, the percentage was even higher, 49.7% (Share of mobile, Statista, 2018). These mobile device percentages are expected to increase over the next few years, with a decline in desktop computing access. Marketers have expressed concern that people will not recall advertisements on mobile devices such as tablets or smartphones to the degree they would when viewing an ad on a laptop or desktop computer. A survey in 2015 found no significant difference between the impact of ads on the smaller vs. larger screens (Mobile video advertising, Statista. 2015). Marketers must respond to a shift in computing access or risk losing contact with their customers. They must adapt to new ways of presenting information and interacting with customers to succeed in this new environment.

Organizations that serve the k-12 (kindergarten-12th grade) educational needs are not keeping up with this critical technical and social change. Traditionally, the organization's websites have been warehouses or specialized libraries for information needed by their customers. The organizations made the transition to

digital files from analog to the Internet to display content on desktops and laptops. Educational organizations demonstrated various levels of marketing creativity in how they promoted their organizations on digital media (McCabe & Weaver, 2018). The mobile environment offers a very different set of constraints and opportunities compared to desktop or laptop computers. Businesses lack a mobile marketing plan, in four out of ten instances (Vermes, 2016). Brands, including those serving the k-12 educational industry are faced with the choice of: 1) customizing their content to mobile as a first priority, 2) allowing their desktop/laptop computer-oriented website to display in this default mode, or 3) some approach in between.

Of particular interest to these researchers were educational marketers offering services in the following areas: establish a positive school culture, increase academic performance, improve safety, decrease problem behavior, and creating physically active classrooms. This research will explore what services and information these organizations offer via mobile devices. The authors asked the following: How is the organization and its services presented on mobile and, does the organization utilize mobile media? This paper addresses which educational programs provided value to customers, and what organizations are doing to promote the brands via mobile devices, and then evaluate/explain how that message is being communicated.

LITERATURE REVIEW

According to Mirkowich (1940), Schumpeter's theory of economic development regarding new value creation and technological innovation has been around since 1940. This theory distinguishes between business cycle concepts and economic changes. There was a logical and systematic meaning to how these cycles of technology and innovation made advancements in business and the welfare of society (Mirkowich, 1940). The structure of information and access is changing as the mobile device has become mainstream (Ghose & Han, 2011; Andrews, Luo, Fang et al, 2015). Through mobile technology, innovation, and expansion beyond production can move toward promotion and open communication. The focus on promotion in society assists the process of transforming communications (Hartman, 2014).

Gupta & Hilal (2011) studied adapting to new technology. They found that since mobile phones are replacing personal computers, users are browsing the internet with a different experience. That experience is now people are spending more time with personal smartphones and interacting with them from when they wake in the morning until they sleep at night. They have more access to information than ever and the digital experience includes security and quality of the data to be considered.

Hopkins & Turner (2012) refer to e-commerce options for mobile strategies, creating a mobile version of the website, so the user is routed to a mobile page, or a dedicated application (app) that is the optimal display on the device used to view the content and provide customers with a direct and ever-present link to a company's products. These are available through the Android Play store and the Apple App store. Most apps are either for purchase or free, and in that case, require permission to collect user data. The app stores have millions of choices available for download.

Marketing via mobile is a major marketing challenge for most businesses, including marketing mobile apps. (Becker and Arnold, 2010; Becker, Berney et al, 2018). Mobile games are increasingly used to engage with customers using apps. For a business to be sustainable more than 3 years, they needed to have social media, networks and mobile games available (Waller, Hockin & Smith, 2017). Mobile apps are used in education for marketing and recruitment of new students (Pechenkina, 2017). Mobile apps have made education more convenient. Students have found that this gives them more time to study, solidify the content of lectures, self-test their knowledge and collaborate. However, there are gaps in the research about which types of apps are most common in higher education. Augmented reality and virtual reality apps are emerging. Concerns for safety, student support, privacy and equity have been raised (Pechenkina, 2017).

Values that are created by apps include perceived ubiquity, an element that includes the always on interactivity, immediate, portable and searchable (Kim, Wang & Malthouse, 2015). Value and convenience come as a result of apps. Among other things, apps create awareness, attitudes, intentions and behaviors (Kim, Wang, & Malthouse, 2015) and this study reports that among other things, branded apps increases purchase behavior.

<u>Mobile Experience and Branding</u>

Kotler & Armstrong (1999) looked at what differences in brand should be promoted: Important – delivers the greatest value to customers, Distinctive – competitors do not offer the difference, Superior – difference is superior to other ways customer can obtain the same benefit, and Communicable – difference is communicable and visible to customers.

David Aaker defined brand equity as "a set of assets (and liabilities) linked to a brand's name and symbol that adds to (or subtracts from) the value provided by a product or server to a firm or that firm's customers." He claims that brand relevance threats are always lurking. The brand relevance is never immune from fading. There is a risk of damage to a brand when it becomes faded instead of stronger. This loss of relevance can happen even if a brand is popular. If people stop buying the category or sub-category of product, it can become irrelevant (Aaker, 2013).

Kotler & Keller (2006) conceived of brand equity as a bridge to connect with customer and potential customers. They considered the Brand Promise as: "the marketer's vision of what the brand must be and do for consumers. At the end of the day, the true value and future prospects of a brand rest with consumers, their knowledge about the brand, and their likely response to marketing activities as a result of this knowledge." Kotler & Keller created the well-known Brand Asset Valuator (BAV) later developed by Young & Rubicon advertising agency as a tool to value the brand in monetary currency.

Kotler & Keller (2006) also presented a BrandDynamics™ Pyramid developed by Millward Brown, which include: Presence, Relevance, Performance, Advantage, and Bonding. Keller's Brand Resonance Model's Brand Building Blocks are depicted in pyramid form from low to high levels: Salience, Performance, Imagery, Judgements, Feelings, and Resonance. "Brands are one of the most valuable intangible assets that firms have" (Keller & Lehmann, 2006).

METHODOLOGY

The authors used key words for outcomes of these educational programs, based on what users would be searching for. The authors looked at these criteria: 1) Establish a positive school culture, 2) Increase academic performance, 3) Improve safety, 4) Decrease problem behavior and 5) Encourage physically active classrooms/education.

The authors searched keywords which were educational outcomes, based on DePorter, Reardon & Singer-Nourie (1999) research in k-12 education. Then, they visited each website, the social media associated with each website, and finally the mobile websites were examined on multiple devices.

The authors considered how these organizations used these terms for promotional messaging, a form of branding the organization. They considered the product or service that the organization was promoting in the analysis. Independently, the authors built Excel spreadsheets and viewed how organizations presented on mobile websites. The next phase of the methodology was to review the mobile experience of the promotional elements. The authors visited the websites on mobile phones and gathered data on the visual elements of the promotion. They also looked to see if there were any downloadable apps for the selected organizations.

Using the following rubric, they created a ranking system based on the following factors. Higher scores meant that the mobile experiences were interactive (Aziz & Kamludin, 2014). The criteria were: 1) Usability – effectiveness – degree user can complete goal, 2) Efficiency – resources needed by user to complete goal, 3) Accessibility – can everyone access what is necessary to complete goal, 4) Learnability – how easily user can learn to interact with website, and 5) Satisfaction – how comfortable user is with interacting with website. Websites were explored on mobile devices on October 11, 2016, November 26, 2017, and August 7 & 8, 2018.

The authors created Table 1 to collect data for judging mobile website experiences. They did not see any mobile apps for any of the educational brands considered in this study. Why there were no mobile apps caught their attention. The authors reviewed a mobile website, Kargo (https://www.kargo.com), which they consider to be a benchmark for today's marketers, based on optimized content delivery and impact. This website is attractive and engaging, providing a benchmark for a systematic comparison to the websites found in the education industry and as described in research conclusions.

Mobile Marketing Delivers Value to Customers

The initial research questions considered value criteria for mobile functionality including: Place (channels of delivery, ex., and a digital space via internet) and Promotion evaluation: Satisfaction, Learnability, Accessibility, Efficiency, and Usability (Aziz & Kamludin, 2014). The authors independently collected this data in August 2018 and then compared with the other researcher. The metrics were clearly visible during the research process. The authors used rubrics with specific outcomes and then gathered in spreadsheets and added qualitative comments.

A second research question considered how mobile marketing is used to differentiate the brand. The study methodology considered how organizations differentiate in marketing. The researchers considered Promotion- positioning brands. Service–order ease, customer training and consultation. The authors also considered what actions the users could make on the mobile web pages.

The research considered the ways that branding promotes differences: Important – delivers the greatest value to customers, Distinctive – competitors do not offer the difference, Superior – difference is superior to other ways customer can obtain the same benefit, and Communicable – difference is communicable and visible to customers (Kotler & Armstrong, 1999).

Cutting edge indicators were selected based on priorities. The researchers looked at national trends, including a CDE digital school districts survey: Top 10 for 2017-18. The three top trends were 1) Personalized Learning, 2) Digital Content, and 3) Professional Development/Skills Training (Castillas, 2018).

RESULTS AND DISCUSSION

In Table 1 the criteria for evaluating the mobile website experiences is presented. For each of the five criteria (effectiveness, navigation, learnability, open access, and satisfaction) the websites were rated on a scale of 4-1, highest to lowest rating.

Table 1: Criteria for Judging the Mobile Website Experience

	4	3	2	1
Effectiveness	All information sought	Most information sought	Some information sought	Cannot find information sought
Navigation	Quickly see links on landing page to information sought	Must explore multiple pages to find information sought	Must use site search tool to find information sought	Cannot find information sought
Learnability	Site intuitively obvious to first time visitor	Navigation is productive after some trial-and-error	Navigation is challenging but can be learned	Navigation is a barrier to learning how to navigate site
Open access	Has access rights to all information sought	Has access rights to some information sought	Must join organization or pay fee for information sought	Cannot gain access unless a part of target group
Satisfaction	Visit exceeds expectations	Visit meets expectations	Visit short of expectations	Visit fails in addressing expectations

Table 1 presents the criteria used when judging the experience of visiting the mobile websites. The scale is 1 is low and 4 is high value.

Table 2 presents the ratings based on the criteria presented in Table 1. The organizations are presented in alphabetical order. It can be noted that there was quite a range for these organizations both within particular criteria and for the overall rating.

Table 2: Mobile Marketing Display Evaluation

	Effectiveness	Ease of Navigation	Learnability	Open Access	Satisfaction	Total
ASCA	2	1	3	2	1	9
ASCD	3	2	3	3	3	14
Edutopia	3	3	4	3	3	16
FISH	2	2	3	3	2	12
Greater Good	2	3	3	3	3	14
NAESP	3	2	3	3	3	14
New York Dept. of Ed.	3	2	3	3	3	14
Safe Support	2	2	3	3	2	12
Success for All	2	2	3	1	2	10
We Are Teachers	3	2	3	3	3	14
Total	25	21	31	27	25	

Table 2 indicates the totals in the right hand column represents the different each website reflected the criteria listed.

Table 2, right side total, has a top potential of 20 points, and the highest scores were 16 and 14, so websites are ranked in the evaluation. Edutopia was a leader in the category. Most of the results were in the midrange. ASCA had the lowest score, with a 9. Table 2 bottom totals, views the pages collectively. How did the mobile web displays perform using this criteria? The displayed pages performed best on Learnability and the worst on Ease of Navigation. The highest category of the five selected, was 31 out of a potential 40 points for Learnability.

Assessing the ease of navigation was a challenge. Navigation issues include: scrolling vs. expanding images and text, clicks vs. first page viewing ability, access, and techniques of pinch vs. expanding pages with fingers for readability.

Establishing an Organization Brand in Mobile

The purpose of branding is to communicate to the target market how the organization understands the needs of the customers and responds effectively to those needs. Done well, branding creates the perception that the organization understands the customers' needs and can quickly satisfy those needs. The desired outcome for the brand is for it to be the preferred choice for the customer and to encourage loyalty to the organization to solve their needs. The authors examined the aspects of Importance, Distinctiveness, Superiority, and Communicability. Table 3 presents the criteria for judging branding.

Table 3: Criteria for Judging Branding

	4	3	2	1
Important				
Benefits from search	Information on landing page	Information within two clicks	Information within four clicks – path not obvious	Could not find information sought
Cutting edge	All three indicators of cutting edge*	Two indicators of cutting edge*	One indicator of cutting edge*	No indicators of cutting edge*
Distinctive	Significantly more of expected than competitors	More of what was expected than competitors	Less of what was expected than competitors	Significantly less of expected than competitors
Superior				
Access to desired benefit	Easy to access desired content	Somewhat easy to access desired content	Somewhat difficult to access desired content	Difficult to access desired content
Loading speed	Much faster than expected	Faster than expected	Slower than expected	Much slower than expected
Communicable				
Clarity	Immediate clarity of match	Some clarity of match	Eventual clarity of match	No clarity of match
Design elements/ video	Visual elements are effective – use video	Visual elements are somewhat effective, some use of video	Visual elements are less effective, marginal video	Visual elements are not effective, no video
Text	Text is complementary with other elements	Text is somewhat complementary with other elements	Communicates primarily through text	Communicates entirely using text

The three cutting edge indicators were personalized learning, digital content and curriculum, and professional development/skills training (Castillas, 2018).Table 3 presents the criteria used when judging the branding efforts of the websites. The scale is 1 is low and 4 is high value.

When looking at the education-related websites, it was clear that some of these websites were making conscious efforts to promote their brand while others appeared to be less attentive to this process. These judgements were the result of evaluating the websites presented by the selected organizations using the criteria proposed by Kotler & Armstrong (1999). This is what the authors found and rated: Importance, Distinctiveness, Superiority, and Communicability. Using these criteria, different approaches to branding became apparent, as indicated in the results of this qualitative study. Table 4 presents the data on branding assessment.

Overall, Edutopia scored the highest (28) on this branding assessment evaluation. They especially excelled in having cutting edge content that was often not offered by the competition. The Edutopia content was available without fees or other commitments such as adding an email address or becoming a member. The website loaded quickly on mobile devices. This contrasted with the website for the New York State Education Department (12). On this website, it was a challenge to finding the content being sought. Although there was extensive information, it was older and dated. Similar content was found on other websites. Access was difficult, made more so due to the website loading slowly. The design of the New York State website was not be optimized for mobile. It appeared to be the same as a desktop experience

displayed on mobile devices. FISH! (27) and the Association for Supervision and Curriculum Development (ASCD) (26) were quite close to Edutopia in branding performance.

Table 4: Branding Assessment Evaluation

	Important		Distinctive	Superior		Communicable			Total
	First Page/ # of Clicks	Cutting Edge	Offering	Access	Speed	Clarity	Design/ Video	Text	
Am School Counselor Assoc.	2	2	1	1	3	2	3	2	16
Assoc. Supervision & Curriculum Dev.	3	3	4	3	4	2	3	4	26
Edutopia	3	4	4	4	4	3	3	3	28
FISH!	3	2	4	3	4	3	4	4	27
Greater Good Science Ctr.	3	2	3	3	3	3	3	3	23
Nat Assoc of Elem School Principals	3	2	2	3	2	2	3	3	20
NY State Education Dept.	1	1	2	1	2	2	2	1	12
Safe Supportive Learning	4	2	2	3	3	3	2	2	21
Success for All Foundation	2	4	3	2	3	3	3	3	23
We Are Teachers	2	3	2	3	3	3	3	3	22

Table 4 reports the results of assessing branding related content, appearance, and navigation on websites. The scale is 1 is low and 4 is high value.

It was informative to look at how the different websites approached each of the areas that were examined. In looking at Importance, which was the apparent value provided to the customers, two indicators (immediacy of desired content and the degree the content is on the cutting edge) were examined. Cutting edge content was determined by the presence of personalized learning, digital content and curriculum, and professional development skills. The New York State Education Department's website had a home page that was focused more on regulations than content for improving education. It took clicking through multiple pages to find the content and the content was dated, literally with material dated from five to ten years earlier. This contrasted with Safe Supportive Learning which had a large number of links on its home page so the content was quickly available but required extreme zooming to read and activate the links. Success for All Foundation had cutting edge content that had a fresh perspective.

Distinctiveness was a determination of what was not available on competitive websites. Content was compared to content among the other websites in this study. The Association for Supervision and Curriculum Development, Edutopia, and FISH! had content that was unique to their websites. The American School Counselor Association had the least unique information on its website.

Superiority was defined as meeting the needs of the customers in better ways. In this study, the degree of or barriers to access to the content plus speed that websites loaded were deemed to be indicators of superiority. Edutopia made all of its content accessible to visitors. Barriers to access were often requirements that a visitor become a member of the organization sponsoring the website on professional organizations or expecting payment for the commercial sites. Several websites required enrolling with an email address but no fee was expected. This approach was viewed as a lessor barrier. New York Department of Education and The American School Counselor Association provided the greatest barriers to access. Association for Supervision and Curriculum Development, Edutopia, and FISH had the fastest loading times for their websites.

Communicability addressed the how easily the value to customers was experienced. In this category the clarity of the navigation was rated. Additionally, the overall design of the website, including use of graphics and video were considered. Finally, the dependence and helpfulness of the text on the site was assessed.

Again, the New York State Department of Education was the lowest rated in each of the three areas. Edutopia was rated the highest in each of the three.

Overall, the authors evaluated the public space that people will be able to see the brand for free on the internet. The researchers saw what the organizations have created for their constituents, their market segments and to communicate their messages. The authors did not have access behind any firewalls or gated content.

Mobile Optimization

An important lesson learned from this research was that adapting to the mobile environment is a challenging process to both conceive how to best utilize this environment and to master the technical requirements for this transition. The websites examined reflected differing progress in this conversion. These websites could be categorized at three levels of adaptation to mobile: 1) Still offering a website that is designed for display and PC computer-based. Content tends to be static with little engaging aspects. There is a dependence on text and photos. 2) Progressing with some elements intended to function well on mobile. Still more reliant on text, some use of voice recordings and videos to provide content. 3) The website is partially optimized for the mobile environment. It is looking good, more engaging with the use of videos beyond the presentation of content. 4) Full optimization for the mobile environment is evident. Striking images and colors display well on a mobile device which engages a visitor. Text is at a minimum, used to guide. See Figure 1 for a depiction of degree of optimization for mobile environment.

Figure 1: Degree of Optimization for Mobile Environment
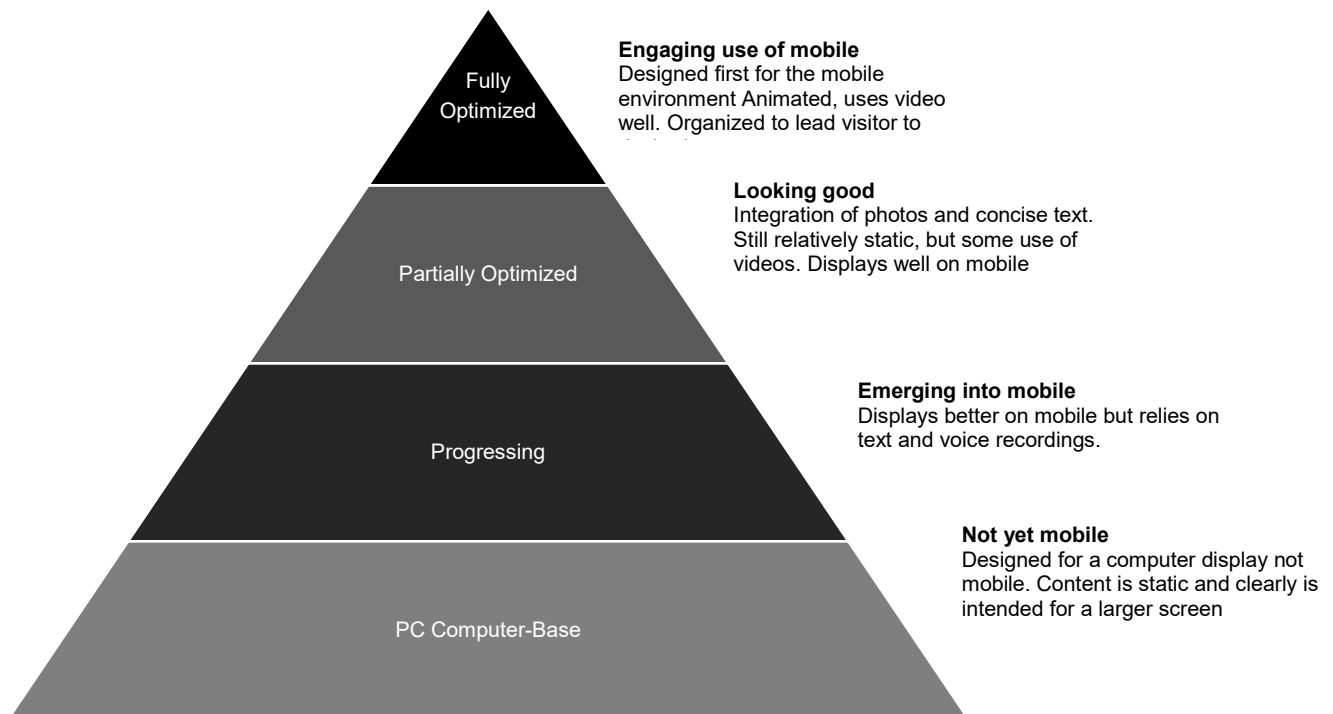
Evaluating the websites in this study using this approach leads to these assessments: New York Education Department presents a PC Computer Based mobile experience. American School Counselor Association, Greater Good Science Center, National Association of Elementary School Principals, Success For All Foundation, and We Are Teachers at the Progressing level. Association for Supervision and Curriculum

Development, Edutopia, and FISH! are Partially Optimized. None of the websites reviewed fit the fully optimized degree, with the benchmark of Kargo.com as fitting this level.

As one additional evaluative step, each of the websites was compared to a website that had been identified as an example of cutting-edge use of the mobile platform. This site, kargo.com, offers web design services for organizations wishing to improve their web presence on mobile. As Kargo's primary initial sales tool, it models the various approaches to use this mobile environment more effectively. The site used short videos and attention-grabbing images to draw visitors into the content they wished to share. The website loaded quickly and was easy to navigate. Only Edutopia and FISH! Philosophy began to approach this high standard as each had important areas for improvement of their branding.

Organizations have very different approaches to using the mobile environment as a means to communicate with their current and potential users/customers. Brands can differentiate their competitors and cut through the clutter of unclear distinction. Some view their websites primarily as an archive, a repository for documents. These websites were minimally optimized for the mobile environment. An apparent challenge is to recognize just how differently web pages appear on a mobile device and how differently people navigate on these devices. Other organizations were more attentive to this challenge of communicating effectively in this environment.

What distinguished the higher performing organizations was most often their offering of the most cutting-edge content, they presented their content in the most distinctive manner, there were few barriers to accessing information sought, the webpages loaded quickly, and there was effective use of video.

All of these organizations had room for improvement when we compared them to the referenced mobile website Kargo.com that was deemed to be at the cutting edge of utilizing this mobile environment. Kargo is a commercial company offering services to organizations wishing to migrate to mobile and improve their presentation in the mobile environment.

CONCLUDING COMMENTS

This research explored the transition of organizations to utilizing the mobile environment for promoting themselves and their services. The transformation to operating in this mobile environment is a dynamic process that is proceeding at greatly varying paces. The importance of branding should not be overlooked because getting the audience's attention is critical to being effective in a competitive environment. These researchers chose to examine the websites of organizations offering services to individuals and organization in the K-12 education field. Similar studies in other industries, especially the service industries such as travel, transportation, and energy would also be fruitful. Subject organizations in this study were identified using specific search criteria that had previously been identified as highly valued by educators. The study utilized criteria for both judging the experience and branding effectiveness. Organizations, such as Edutopia, were among the top performers in both experience and branding. The top rated organizations are examples for other organizations to follow. The limitations for this study included its pioneering nature and the narrow market studied. Obviously, studies in other industries would need appropriate search criteria for the chosen industries. This research was initially conceived as how websites were presented on computers. With the explosion of the use of mobile, the study morphed into looking at how the branding via websites were presented on mobile devices.

Further research should be considered regarding the technology adoption curve. For example, is the experience much different when comparing the mobile native vs. the mobile immigrant? The challenging balance for the brands in educational programs is to use the latest technology and still be able to keep the early adopters involved.

Mobile website user skills for easy navigation should also be researched further. Some users may prefer to scroll through the pages vertically or horizontally vs. expanding images and text. Clicks vs. first page viewability was discussed. Navigation of the websites could be studied, for example, pinch vs. zooming in on pages with fingers for readability.

Other researchers may use the new model (Figure 1: Degree of Optimization for Mobile Environment) in their studies of effective branding and have a more quantitative approach to their data collection. There may be some correlation with the levels of customer loyalty and net promoter scores and how the mobile websites are optimized for the brand.

<u>Limitations of Our Study</u>

As mentioned in the literature review, the validity of rater matters, and your experience may vary. Rater capability of the user makes a difference in how to find websites and to navigate once on the mobile page.

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ACCREDITATION STANDARDS AND THE INTEGRATION OF PART-TIME FACULTY

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ABSTRACT

Part-time faculty employed by institutions of higher education as a percentage of total institutional faculty increased in the last decades. This trend is attributed to several factors such as costs, competition, and a desire for staffing flexibility. Increased reliance on part-time faculty, however, can present issues for accreditation. AACSB International defines supporting faculty as members who primarily teach, and who do not participate in the intellectual or operational life of the school. In contrast, participating faculty members, in addition to teaching, engage in a broader range of activities in support of the school's mission, such as advising, research, service commitments, participation in shared governance and policy guidance. Certain percentage thresholds must be maintained for participating faculty in programs and disciplines. Although participating faculty members tend to be long-term members of the faculty, permanent employment is not key. This presentation will discuss ways in which supporting faculty, typically part-time faculty, can be involved in a more significant way with the mission of the college and become contributing members. Such an inclusive approach, which provides part-time faculty with professional development opportunities, research support, and integration into program activities, can prove to be mutually beneficial.

INTRODUCTION

This article juxtaposes the concerns about the sharp increase in the growth of part-time faculty with the potential problems that such growth may cause for accreditation. It surmises that an inclusive approach to the integration of part-time faculty may not only allay fears regarding quality concerns about the expansion of this faculty group, but also address potential accreditation concerns. First, the paper will discuss the growth in part-time faculty and the benefits of including them in university development opportunities. Then it will address the Association to Advance Collegiate Schools of Business (AACSB) accreditation standards concerning participating and supporting faculty members. Finally, it will propose strategies for incorporating these adjunct faculty into the life of the university to improve the experience for all constituents while staying within prescribed boundaries required of participating faculty, i.e., those faculty who are dedicated to advancing the mission of the school.

LITERATURE REVIEW

Fall enrollment numbers demonstrate significant growth in postsecondary students increasing 23 percent between 1995 and 2005, and 14 percent between 2005 and 2015 (Fast Facts, 2018). Understandably, the number of faculty in degree-granting, postsecondary institutions increased 51 percent from fall 1999 to fall 2016, but with full-time faculty increasing only 38 percent during that period, and part-time faculty increasing to 74 percent, almost twice as much, from 1999 to 2011 (but decreasing 4 percent between 2011

and 2016) (Way, 2018). Only 30.2 percent of faculty were employed part time in 1975, compared to 48 percent of all faculty members in 2005 (Monks, 2009). Thus, the increased demand for faculty in response to institutional growth has been satisfied in large part through the employment of part-time faculty.

Several factors have influenced the trend including 1) increasing financial pressures, 2) changes in government funding for higher education, 3) a growing concern about college spending on faculty, 4) increased competition from nontraditional education providers, 5) demands for flexibility and 6) changes in student enrollment and demographics (Frye, 2017). Hiring part-time instructors can mitigate the need for full-time faculty to teach an overload to meet demand, provide expertise that is not available within a program and keep program costs manageable (Hill, 2019). "Their short-term, inexpensive contracts, offering no obligation of renewal, provide institutions with much-needed options in managing budgets." (Rowh, 2018, p. 41). While reliance on part-time instructors may have increased dramatically, there is not necessarily a corresponding decrease in educational outcomes. One study found that instruction by full-time faculty does not lead to higher graduation and transfer rates when compared to instruction by part-time faculty (Rossol-Allison & Beyers, 2011). However, part-time instructors often are detached from university life, not well-compensated, and excluded from opportunities available to fulltime faculty. Because faculty play a critical part in realizing institutional roles and missions and fostering teaching and learning, all faculty, not just tenure track or full-time members, must be integrated into the fabric of institutional life (Morphew, Ward & Wolf-Wendel, 2017). Developing a more inclusive attitude about part-time faculty can produce benefits for students, faculty, the educational institution, and accreditation expectations.

Part-Time Contigent Faculty

A population usually with full-time jobs, part-time instructors often bring a wealth of real-world experience and subject-matter expertise to the classroom, but may lack knowledge of pedagogical theory and learning techniques, which can have a negative impact on student retention and contribute to adjunct-faculty attrition (Lorenzetti, 2019). Often, student success for retention and completion rests in large part upon their efforts (Anft, 2018). Therefore, it is wise to invest in this population and provide training in areas such as classroom organization and management, content presentation, and techniques for fostering learning (Lorenzetti, 2019), particularly given the large number of students they teach.

Mentoring part-time faculty can have a positive institutional impact by fostering increased communications, improved satisfaction with employment, increased feelings of worth and belonging, increased departmental college and university involvement, increased knowledge of learning management systems and technology, increased institutional effectiveness and quality, and an enhanced skill set for contingent faculty (Luna, 2018). Mentoring is particularly important for online adjunct faculty who are spatially detached as well, albeit more challenging. Nevertheless, "[I]f institutions are able to offer online educational successfully to students, it should follow that they can build an infrastructure to facilitate communications, professional development and mentoring" (Luna, 2018).

Including part-time members in faculty development programs allows them to unite with full time faculty through shared professional experiences, and lessens the gap between them both geographically and culturally, resulting in a greater sense of shared institutional identity (Donnelli, Mandernach, & Dailey, 2019). Encouraging them to participate in professional development activities not only demonstrates that they are valued, but also can enhance program efficiency and the student experience (Garcia, McNaughtan & Nehls, 2018). It is a good practice to prepare part-time faculty for their role in the college, for example, by encouraging them to attend workshops at the institution's center for teaching and learning, familiarizing them with assessment protocols and sharing sample rubrics for assignments (Focarile, 2018). Providing orientation and mentorship programs, access to pedagogical workshops and videos, as well as access to

certifications, such as *Quality Matters*™ for online teaching, along with other faculty development activities, helps to build professionalism and a sense of belonging to a community (Hill, 2019).

Relying heavily on part-time faculty without providing enough support for their craft could impair the achievement of institutional goals for quality and completion; moreover, just-in-time hiring practices without performance evaluation procedures can adversely impact the teaching and learning experience (Roney & Ulerick, 2013). Because part-time faculty can be isolated, it is beneficial to integrate them into the academic community. As noted previously they should be incorporated into institutional life by participating in orientation and ongoing professional development activities, as well as being included in institutional databases and systems (Morphew, Ward & Wolf-Wendel, 2017). Other options to integrate part-time faculty more fully into the academic community include inviting them to faculty meetings, listing them on departmental websites, providing financial support for professional development, and ensuring formative feedback of their performance (Rowh, 2018).

Typically, only full-time faculty participate in accreditation exercises, serve on hiring committees, and provide oversight to curricular reforms. However, as the percentage of full-time faculty shrinks, the service work load does not; this reality requires full-time faculty to assume greater service loads, which can compromise their research agenda, as well as teaching and learning responsibilities (Nutting, 2003). Including part-time faculty in appropriate roles in institutional affairs can alleviate that stress, to a degree. Developing a sense of community aids the retention of this pool of faculty, and reduces turnover. (Hill, 2019). If possible, part-time faculty should be provided space for interacting with students, library access, photocopying services as well as access to computers (Nutting, 2003). Sponsoring an annual event geared toward part-time faculty allows educators to share tips and to highlight campus resources (Anft, 2018). Annual awards recognizing the contribution of part-time faculty should be encouraged, as well (Roney & Ulerick, 2013). To the extent feasible, multi-year appointment should be considered because the expectation of continuity may prompt part-time faculty to become more vested in the institution, encourage an ongoing relationship with students, and provide a more formal avenue for peer review and formative feedback (Gluckman, 2017). In sum, acknowledging the contribution of part-time faculty and taking steps to assist in their professional development, as well as to include them in the campus community, benefits everyone involves: full-time faculty, part-time faculty, students, and the institution.

AACSB Classifications

The mission of the AACSB is to foster engagement, accelerate innovation, and amplify impact in business education. As key participants in business education, faculty qualifications and sufficiency are critical components of the AACSB's accreditation standards. Having sufficient faculty who are engaged in the mission of the institution and who contribute to its intellect vitality are crucial. Standard 5 on faculty sufficiency and deployment provides that the school must maintain and deploy "a faculty sufficient to ensure quality outcomes across the range of degree programs it offers and to achieve other components of its mission. Students in all programs, disciplines, locations, and delivery modes have the opportunity to receive instruction from appropriately qualified faculty." This standard defines a participating faculty member as one who is actively and deeply engaged in the activities of the school in matters beyond direct teaching responsibilities. Examples listed include: participation in policy decisions, advising, research, service, as well as directing extracurricular activities, providing academic and career advising, representing the school on institutional committees and participating in the governance of the school by serving on committees responsible for academic policymaking and/or other decisions.

The standard recognizes that, typically, participating faculty are long-term members of the faculty; nevertheless, faculty may be classified as participating regardless of whether 1) their appointments are of a full-time or part-time nature, 2) their position with the school is the faculty member's principal employment, or 3) the school has tenure policies. Therefore, full-time employment at the school is not the litmus test.

In adopting the 2003 revised standards the committee moved away from the fulltime--part-time distinction, which defines a contractual relationship, in favor of "the extent the intellectual capacities of that faculty member are engaged in the school" (Thompson, 2004). Under current standards a participating faculty member may participate in "faculty development activities and have non-teaching assignments, such as advising, as appropriate to the faculty role the school has defined, taking into consideration the depth and breadth of the non-teaching assignment" (AACSB Standard 5, 2013). In other words, these faculty members engage with the institution beyond teaching responsibilities. The movement away from a contractual definition of participating/supporting, for example, recognizes the value that could be added to curriculum development by a working professional adjunct faculty member with a full-time practice who is familiar with market needs and expectations (Thompson, 2004).

In contrast a "supporting faculty member does not, as a rule, participate in the intellectual or operational life of the school beyond the direct performance of teaching responsibilities" (AACSB Standard 5, 2013). Usually, a supporting faculty member is appointed on an ad hoc basis exclusively to fulfill teaching responsibilities for a term or academic year without the expectation of continuation. A supporting faculty member "does not have deliberative or involvement rights on faculty issues, membership on faculty committees, or assigned responsibilities beyond direct teaching functions" (AACSB Standard 5, 2013). In sum, these faculty members only support the teaching function of the school and not its holistic mission. To judge the difference between participating and supporting faculty, an accredited school must adopt and apply criteria for documenting faculty members' roles that are consistent with its mission and that meet the spirit and intent of Standard 5. "The criteria should address: The activities that are required to attain participating status. The priority and value of different activity outcomes reflecting the mission and strategic management processes. Quality standards required of each activity and how quality is assured. The depth and breadth of activities expected within a typical AACSB accreditation review cycle to maintain participating status." (AACSB Standard 5, 2013).

One university's criteria for classifying faculty as participating during the academic year required a minimum of three of the following criteria to be met annually: 1) serve on a department, college or university committee, 2) advise students, 3) advise a business student organization or engages in chapter activities, 3) regularly attend and participate in department meetings, 4) regularly attend and participate in faculty assemblies, 5) participate in the assessment system, 6) attend professional development activities and 7) demonstrate scholarly activity (Polimeni & Burke, 2018). Standard 5 specifies that the criteria selected to classify faculty as participating or supporting must be consistent with the academic unit's mission. Depending the division of labor across faculty and professional staff, a sufficient number of participating faculty are needed to perform or oversee curriculum development, course development, course delivery, assessment and assurance of learning, other activities that support instructional goals and the achievement of other mission activities. Mission activities include, for example, intellectual contributions, executive education, if appropriate, community service, economic development, institutional service, service in academic organizations, consulting activities, and other expectations the school holds for faculty members. Standard 5 also provides ratios for participating and supporting faculty, with participating faculty members being expected to deliver at least 75 percent of the school's teaching (measured by credit hours, contact hours, or other appropriate metric), and at least 60 percent of the teaching in each discipline, academic program, location, and delivery mode. Participating faculty should be distributed "across programs, disciplines, locations, and delivery modes consistent with the school's mission" (AACSB Standard 5, 2013). If a "substantial proportion of a business school's faculty resources hold primary faculty appointments with other institutions, the school must provide documentation of how this faculty model supports mission achievement, overall high quality, and continuous improvement and how this model is consistent with the spirit and intent of this standard," particularly how the "faculty model is consistent with achieving the research expectations of the school" (AACSB Standard 5, 2013).

Strategies for Integration

The increase in adjunct faculty in institutions of higher education represents a trend that may not abate soon. As discussed previously, it is advisable for colleges and universities to involve part-time faculty in the academic community. Providing professional development activities and supporting both their pedagogical content knowledge as well as their discipline content knowledge enhances the educational experience of the student. Adopting an inclusive approach also connects part-time faculty with the university community so that they are not isolated, but instead are involved in the mission of the school. Standard 5 of the AACSB accreditation standards subtly supports this direction by not necessarily classifying part-time faculty as supporting faculty. Instead, the standard evaluates whether they perform function in support of the mission of the school, and not whether their appointment is full-time. How can faculty members who are part time be considered participating rather than supporting?

Participation in shared governance represents one avenue for inclusion that technology can easily facilitate, even with part-time faculty teaching in distance programs. For online part-time faculty, or even for residential affiliates who are employed elsewhere, Skype®, Zoom®, webinars, and other aids allow for faculty members to participate in faculty meetings (departmental or college), committee meetings, professional development activities offered by the institution through its teaching center or in other events, such as research seminars. Some part-time faculty, both distance and residential affiliates, may be accomplished in their field of expertise and could be included on advisory board appointments for the university, college, or department. Often that expertise could translate into mentoring students or coaching student competitions, or inviting lectures by the affiliate on their subject matter expertise. Establishing a career mentors program is another way to leverage that expertise for the benefit of the students enrolled in both distance and residential programs. Encouraging participation in alumni events offers anther conduit for involvement by part-time faculty in the life of the school.

Given the pay scale of part-time instructors, it is not necessarily reasonable to expect them to pay to participate in professional development events. Nevertheless, funding travel for part-time faculty members so that they could present intellectual contributions at conferences and attend development events on campus or elsewhere is certainly more affordable than funding a faculty line. Continuity is important under AACSB standards, as well as being important to part-time faculty. Providing formative feedback on the performance of part-time faculty members, and to the extent possible, offering contract renewal options based upon performance evaluations, allows the benefits of both reflective and forward-looking assurances. To this end, it is advisable to have an application process for differentiating *Participating Affiliates* from *Supporting Adjuncts* with a list of requirements for the classification. This step also helps to delineate the difference between the two groups as required by Standard 5.

For example, one requirement should be that the participating affiliate maintain credentials that would make them *qualified* under AACSB standards, defined as faculty members "who sustain intellectual capital in their fields of teaching, demonstrating currency and relevance of intellectual capital to support the school's mission, expected outcomes, and strategies, including teaching, scholarship, and other mission components." (AACSB Standard 15, 2013). Under Standard 15, qualified faculty sustain intellectual capital in their fields of teaching and demonstrate "currency and relevance of intellectual capital to support the school's mission, expected outcomes, and strategies, including teaching, scholarship, and other mission components" (AACSB Standard 15, 2013). The categories for qualified faculty status consider the initial academic preparation, initial professional experience, and sustained academic and professional engagement as defined in the four classifications of Scholarly Practitioners (SP), Instructional Practitioners (IP), Scholarly Academics (SA), and Practice Academics (PA).

Also, there should be a menu of options for actively and deeply engaging in the activities of the school in matters beyond direct teaching responsibilities (Standard 5). Opportunities include: directing

extracurricular activities, providing academic and career advising, representing the school on institutional committees, joining college committees, participating in course development, delivery and assessment, mentoring students or student projects, producing high-quality and impactful intellectual contributions, engaging in executive education, community service, service in academic organizations, service supporting economic development, and organizational consulting (AACSB Standard 5). Table 1 illustrates a range of potential activities across the functional areas of policy decisions, shared governance, advising, research, and other service commitments.

Table 1: Activities to Support Participating Faculty Status

Policy Decisions/Service	Advising	Research
Faculty Governance	*Directing extra-curricular activities*	*Development Activities*
Committees	*Academic and career counseling*	*Intellectual contributions*
Serving on College or University committees	Advising student clubs or preparing students for competitions	Funded travel to attend development events at the university or elsewhere
Serving on College or University advisory boards	Being Career Mentors for students in distance or residential programs	Funded travel to present at conferences, symposiums, colloquiums
Participating in departmental and/or college meetings	Participating in alumni events Organizational or economic	Invited participation in professional
Participating in course development and peer review of teaching	development consulting	development programs or speaker series
Participating in curriculum development and assessment	Supervising internships and/or independent studies	Producing intellectual contributions in support of the school's mission

This table summarizes the three major categories of matters beyond direct teaching responsibilities, i.e., policy decisions/service commitments, advising, and research, complemented with examples of appropriate activities under each heading, the engagement of which could support the status of the contributing faculty classification.

CONCLUDING COMMENTS

This article discusses the increasing number of part-time faculty at institutions of higher education, a trend that is not likely to abate soon. It asserts that making efforts to include this category of faculty into the life of the institution, by committing resources to their professional success and expanding their opportunities for contribution, will benefit stakeholders in higher education. The article also discusses the AACSB standard on faculty sufficiency, and the classification of participating versus supporting faculty, noting that the standard allows part-time faculty to be classified as participating providing they are engaged with, and contribute to, the mission of the institution. For fast-growing programs or situations in which searching a permanent faculty line is not an option, being able to classify part-time faculty as participating could be crucial for compliance with accreditation standards. Finally, the article suggests strategies for incorporating part-time faculty into the life of the institution to ensure quality outcomes across degree programs, to assist with accreditation expectations, and to achieve other components of the mission.

There are limitations to this strategic goal of inclusion. More involvement may not be feasible for all part-time faculty, given their other professional commitments. Further, the collective bargaining in unionized faculties may impose constraints on how part-time faculty are incorporated into the existing structure, particularly given that adjunct faculty are increasingly becoming union members (Edwards & Tolley, 2018). Finally, any future evaluation of this topic could compare the institution of a *Participating Affiliate* program with existing *Executive in Residence* programs, which further a school's mission of quality business education by inviting executives to share their expertise with students. These programs are organized to allow executives to provide, for example, lectures, workshops, career counseling, competition judging, supervision of course projects, and assistance with networking, and thus, may be instructive for a programs designed to incorporate part-time faculty into similar engaged roles.

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