INCLUSIVE, TECHNOLOGY-ENRICHED BUSINESS CURRICULA POSITIVELY IMPACT MINORITY LEARNING OUTCOMES AND EMPLOYMENT OPTIONS

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ABSTRACT

With average student loan debt tripling to more than $1.6 trillion since 2006 and the average student graduating with nearly $30,000 in student loans, college students expect both engaging curricula and skills development that ultimately result in long-term financial health. Concurrently, employers actively recruit students who have been exposed to technology systems and understand how individual decisions affect the whole and that a team-based effort for organizational decision-making is essential for financial success. This paper measures self-efficacy of career readiness and competencies when students participate in experiential-based learning, technology-enriched curricula. More importantly, the paper evaluates the effect of this curricula on minorities. Empirical evidence supports that experiential education leads to a deeper understanding of the subject than without, a capacity to think critically and apply knowledge in complex and/or ambiguous situations, and the ability to engage in lifelong learning both within and without the workplace. Autodidactic assignments are designed to provide students with both independent and team-based learning opportunities with progression from typical to complex. Successful completion of which develops critical thinking, problem solving, communications, collaboration, leadership, and intercultural skills in addition to technological proficiency. The curricula target undergraduate learners in a university where slightly more than one-half of undergraduate students are self-reported minorities. A Likert item survey was distributed across business disciplines in these technology enriched courses; Likert items were aggregated into two Likert scales. The results of this paper show that the curricula improved learning outcomes and thereby positively impacted employment options with no disadvantage to minority participates. Thus, the curricula overcame any initial dispersion in knowledge and readiness between minorities and non-minorities. (Finance, Data Analytics, FinTech, Experiential Learning, High Impact Educational Practices).

INTRODUCTION

With average student loan debt tripling to more than $1.6 trillion since 2006 according to Moody's, college students expect both engaging curricula and skills development that ultimately result in financial health after graduation (Seltzer, 2020). Concurrently, employers actively recruit students who have been exposed to technology systems and understand how individual decisions affect the whole and that a team-based effort for organizational decision-making is essential for financial success (NACE, 2019). This paper measures self-efficacy of career

readiness and competencies when students participate in experiential-based learning, technology-enriched curricula. More importantly, given that income inequality even among developed countries such as the United States, United Kingdom, and Mexico is at historical levels (OECD, 2019) the paper evaluates the effect of this curricula on minorities.

The paper's underlying premise is that improvement in learning outcomes directly impacts students' perception of their employment opportunities. According to Bandura (1977),

"People make causal contributions to their own psychosocial functioning through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than beliefs of personal efficacy. Unless people believe they can produce desired effects by their actions, they have little incentive to act. Efficacy belief, therefore, is a major basis of action. People guide their lives by their beliefs of personal efficacy."

Thus, according to Bandura (1986; 1997), students not only must acquire knowledge and skills via the curricula but also be convinced of their ability use this knowledge and perform these skills under typical and even challenging circumstances. Consequently, the paper uses self-efficacy of employment options and learning outcomes to evaluate curricula effectiveness including inclusiveness.

The experiential nature of the curricula is critical to the linkage of learning outcomes and employment options Annie, 2019. Specifically, empirical evidence repeatedly supports that experiential education leads to a deeper understanding of the subject than without, a capacity to think critically and apply knowledge in complex and/or ambiguous situations, and the ability to engage in lifelong learning both within and without the workplace (Eyler, 2009; Kolb, 1984; Moore, 1981). Thus, by using experiential learning, specific career readiness and competencies are addressed (NACE, 2019). Specifically, the integrated curricula design embeds experiential enterprise resource planning (ERP), accounting, business intelligence, and data analytics technologies into marketing, healthcare, finance, economics, accounting, and management business curricula via SAP (Systems, Applications, and Products) software. The quality of the curricula is also independently validated for the courses by SAP University Alliances Program – North America. Given improved readiness and skills, greater employment options follow.

SAP (2019) was selected for a specific reason: it is the world's largest provider of enterprise application software. SAP is the leader in the ERP and business analytics/intelligence market, servicing approximately 437,000 clients in 180 countries; 77 percent of all worldwide business transactions touch an SAP system. These clients include 92 percent of the Forbes global 2000 companies, but approximately 80 percent of SAP customers are considered small or medium enterprises (SMEs). SAP uses streamlined processing systems that allow businesses to use live data to predict customer trends thereby saving time and money while simultaneously making more profitable decisions (Schwartz et al. 2005). The use of SAP (2019), however, is nonlimiting; students can easily transfer these skills to other technologies including Microsoft and Oracle and employers recognize this talent. Autodidactic assignments are designed to provide students with both independent and team-based learning opportunities with progression from typical to complex. Successful completion of which develops critical thinking, problem solving, communications, collaboration, leadership, and intercultural skills in addition to technological proficiency (Templeton, 2011; Finley & McNair, 2013).

The curricula targets undergraduate learners in a university where slightly more than one-half of undergraduate students are self-reported minorities; more specifically, nearly one-half of undergraduates receive Pell grants, but only 30% are eligible for Helping Outstanding Students Educationally (HOPE) scholarships according to 2018 profile of Complete College Georgia.

Bunce et al. (2019) find that minority students need learning environments that meet relatedness, competence, and autonomy needs to fully achieve their learning potential. The experiential learning environment combined with autodidactic assignments meets these specifications. Delays in transition from education to work have been proven to *'scar'* market entrants and negatively impact employment and career progression Cockx & Picchio, (2013); empirical evidence also documents ethnic disadvantages in employment rates. The results of this paper show that the curricula improve learning outcomes and thereby positively impact employment options with no disadvantage to minority participates (Brownell & Lynn, 2010). Thus, the curricula overcome any initial dispersion in knowledge and readiness between minorities and non-minorities (Algan et al., 2010).

METHODS

A ten Likert item survey was distributed across business disciplines during Fall 2017 and Fall 2018 technology enriched courses; Likert items were aggregated as a learning outcome Likert scale (items 1-5 in Table 1) and an employment options Likert scale (items 6-10 in Table 1. Additional demographic questions enabled students to self-identify as minority in addition to major(s) and the number of enhanced courses taken by the end of fall 2018. The survey used a 5-point Liker scale of Strongly Agree, Somewhat Agree, Neutral, Somewhat Disagree, and Strongly Disagree with respective numerical scaling of 5, 4, 3, 2 and 1.

Table 1
ITEMS USED IN AGGREGATE TO CREATE TWO LIKERT SCALES LIKERT ITEMS
Combining SAP technology with my major curricula
1. has deepened my level of understanding of my discipline(s)
2. has enabled me to apply/analyze/synthesize discipline content
3. has made me a more adaptable (capable of adjusted to different conditions) learner
4. has made me a more agile (quick to adjust to different conditions) learner
5. has increased my understanding of how businesses use technology to improve decisions
6. increases my commitment to graduating
7. makes me a more attractive employment candidate upon graduation
8. will result in a higher starting salary upon graduating
9. would influence my decision to attend this specific college if I were a freshman or transfer student assuming SAP was explained during orientation or by some other means
10. has made me more likely to recommend SAP courses to others

Cronbach's alpha of reliability coefficient is used to create the optimal Likert scale on aggregate. Once consistency is achieved, the mean of the aggregated scale is then calculated for each observation to create continuous data (Harpe, 2015). The Shapiro-Wilk statistic for normality then determines if parametric or non-parametric statistics will be used to test these following hypotheses:

$H1$: $\mu_{Minority}$ *(Learning Scale)* = $\mu_{non\text{-}Minority}$ *(Learning Scale)*

$H2$: $\mu_{Minority}$ *(Employment Scale)* = $\mu_{non\text{-}Minority}$ *(Employment Scale)*

If the curricula are inclusive, the means for the minority learning outcome scale and the non-minority outcome scale will be statistically equal. Likewise, if the curricula are inclusive,

the means for the minority employment options scale and the non-minority employment options scale will be statistically equal (Artino Jr, 2012).

The final hypothesis tests if the curricula overcome any initial dispersion in knowledge and readiness between minorities and non-minorities using the following hypothesis:

H3: p (Employment Scale, Minority) = p (Learning Scale, Minority) = 0

Where *p* is an appropriate correlation measure and Minority represents a dummy variable of 1 if the student sampled is a minority and 0 otherwise. If the impact of learning outcomes on employment options is not influenced by student minority status, the curricula successfully mitigates initial dispersion in knowledge and readiness (Bradley & Nguyen, 2004).

RESULTS AND DISCUSSION

A total of 159 students responded resulting in 145 fully completed surveys of which nearly 36 percent (52 students) identified as minority. As reported in Tables 2 and 3, consistency was achieved; George, (2008) and George & Mallery (2003) categorize an Alpha > 0.9 as excellent. While using five items to create each Likert scale meets reliability measures, the alpha is improved by deleting Likert item #9.

Table 2 USING CRONBACH'S ALPHA OF RELIABILITY COEFFICIENT FOR INTERNAL CONSISTENCY RELIABILITY STATISTICS – 10 LIKERT ITEMS		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
0.925	0.927	10
Likert Item	Mean	Cronbach's Alpha if Item Deleted
1. has deepened my level of understanding of my discipline(s)	3.76	0.916
2. has enabled me to apply/analyze/synthesize discipline content	3.94	0.915
3. has made me a more adaptable (capable of adjusted to different conditions) learner	4.06	0.916
4. has made me a more agile (quick to adjust to different conditions) learner	3.97	0.917
5. has increased my understanding of how businesses use technology to improve decisions	4.27	0.915
6. increases my commitment to graduating	3.52	0.921
7. makes me a more attractive employment candidate upon graduation	4.20	0.914
8. will result in a higher starting salary upon graduating	3.65	0.919
9. would influence my decision to attend this specific college if I were a freshman or transfer student	3.37	0.928

assuming SAP was explained during orientation or by some other means		
10. has made me more likely to recommend SAP courses to others	3.76	0.917

Table 3
USING CRONBACH'S ALPHA OF RELIABILITY COEFFICIENT FOR INTERNAL CONSISTENCY RELIABILITY STATISTICS – 9 LIKERT ITEMS

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.928	0.929	9
Likert Item	Mean	Cronbach's Alpha if Item Deleted
1. has deepened my level of understanding of my discipline(s)	3.76	0.918
2. has enabled me to apply/analyze/synthesize discipline content	3.94	0.917
3. has made me a more adaptable (capable of adjusted to different conditions) learner	4.06	0.919
4. has made me a more agile (quick to adjust to different conditions) learner	3.97	0.918
5. has increased my understanding of how businesses use technology to improve decisions	4.27	0.917
6. increases my commitment to graduating	3.52	.925
7. makes me a more attractive employment candidate upon graduation	4.20	0.916
8. will result in a higher starting salary upon graduating	3.65	0.923
10. has made me more likely to recommend SAP courses to others	3.76	0.923

Consequently, consistency was achieved by creating the Learning Outcomes Likert scale aggregating Likert items 1 thru 5, but the Employment Options Likert scale was created by aggregating Likert items 6, 7, 8, and 10 only.

Table 4 provides evidence that neither Likert scale is normally distributed; therefore, non-parametric statistic Mann-Whitney U is used to analyze the means.

Table 4
NORMALITY TEST AND ANALYSES OF MEANS H1 AND H2 STATISTICAL ANALYSES

Shapiro-Wilk			
Likert Scale	Statistic	df	Sig.
Employment Options	0.913	145	0.000
Learning Outcomes	0.861	145	0.000
H1: $\mu_{Minority}$ (Learning Scale) = $\mu_{non\text{-}Minority}$ (Learning Scale) Grouping variable: minority			
Mann-Whitney U		2210.500	

Wilcoxon W	6581.500
Z	-0.860
Asymp. Sig. (2-tailed)	0.390
H2: μ $_{Minority}$ (Employment Scale) = μ $_{non-Minority}$ (Employment Scale) Grouping variable: minority	
Mann-Whitney U	2190.500
Wilcoxon W	6561.500
Z	-0.943
Asymp. Sig. (2-tailed)	0.346

Based on the lack of significance, the means, even when grouped as minority, of each Likert scale exhibit no statistical difference, i.e. both H1 and H2 are proven to be true.

Table 5 NON-PARAMETRIC SPEARMAN RHO COORRELATIONS H3 STATISTICAL ANALYSIS				
H3: p (Employment Scale, Minority) = p (Learning Scale, Minority) = 0				
		Employment Scale	Learning Scale	Minority
Employment Scale	Correlation Coefficient	1.000	0.666[**]	0.079
	Sig. (2-tailed)	0.000	0.000	0.347
	N	145	145	145
Learning Scale	Correlation Coefficient	0.666[**]	1.000	0.072
	Sig. (2-tailed)	0.000	0.000	0.392
	N	145	145	145
Minority	Correlation Coefficient	0.079	0.072	1.000
	Sig. (2-tailed)	0.347	0.392	0.000
	N	145	145	145

**Correlation is significant at the 0.01 level (2-tailed).

Based on Spearman's rho analyses in Table 5, a strong positive correlation exists between the Learning Outcomes Likert scale and the Employment Options Likert scale; moreover, minority status is correlated neither with Learning Outcomes nor with Employment Options.

CONCLUSION

This paper statically documents self-efficacy of career readiness and competencies when students participate in experiential-based learning, technology-enriched curricula. Students acquire both knowledge and skills via the curricula and are confident in their ability to use this knowledge and perform these skills under typical and even challenging circumstances resulting in expanded employment option perceptions. The paper uses self-efficacy of employment options and learning outcomes to evaluate curricula effectiveness including inclusiveness. The results of this paper show that the curricula improve learning outcomes and thereby positively impact employment options with no disadvantage to minority participates. Thus, the curricula overcome any initial dispersion in knowledge and readiness between minorities and non-minorities. The results are limited to the sample size, number of minority respondents, and non-normality of the data. Additional research should be completed as the program continues to mature.

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