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Exploring the Relationships of Two Curriculum-improved Abilities Scales, Professional Development and Quantitative Skills, to Business Student Satisfaction and Employment Preparedness

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Abstract

Despite the pandemic, on-going efforts to evaluate student perceptions of their curricula improving their abilities across different areas needs to be continued. This study examined one business school's undergraduate curriculum. Twelve individual item goals of this curriculum closely corresponded to what employers look for on college students' resumes (NACE, 2021). Ninety-three Fall 2021 graduating business seniors filled out a survey asking their perceptions about the business school's curriculum improving their abilities on these twelve goals. To date, these individual attributes have not been analyzed together in prior studies to produce a smaller set of research scales. A factor analysis of these twelve individual items resulted in keeping nine of these items, creating two new reliable and distinct scales for future research, labeled as Professional Development (5 items) and Quantitative Skills (4 items). Significant positive relationships between these two scales and two outcomes, student satisfaction and employment preparation, were subsequently found. In addition, a new short multi-item, reliable Employment Preparedness scale was developed. After controlling for record-based student demographics (gender, race, state residency) and school-related variables (GPA, transfer student, quantitative/qualitative major), Quantitative Skills accounted for significant variance in both outcomes, while Professional Development accounted for only student satisfaction.

Keywords: graduating business students, curriculum-improved abilities, professional development, quantitative skills

1. Introduction

1.1 Introduce the Problem

As the world continues to grapple with the uncertainty of the pandemic, college students are understandably concerned about the economy, including getting a good job once they graduate (Klebs, Fishman, Nguyen & Hiller, 2021). A general survey (Finley, 2021) of 496 hiring managers indicated that just 62%. of employers believe that most or all college graduates possess the knowledge and skills needed to succeed in entry-level positions, and fewer (55 percent) believe they possess the knowledge and skills required for advancement and promotion (Finley, 2021). The most recent National Association of Colleges and Employers' (NACE, 2021) survey noted that the highest attributes employers seek on a graduating college senior's resume include the: ability to work in a team (81%); problem-solving skills (79%); analytical/quantitative skills (76%); verbal communication skills (73%); written communication skills (72%); technical skills (68%); and leadership (67%). However, recent INSIDE Higher Ed articles (Bauer-Wolf, 2018; Jaschik, 2015) comparing percentages of college graduates who think they are prepared or proficient on these attributes versus employers' corresponding evaluations indicates that employers give graduates a much lower percentage "preparedness" as well as proficiency scores. For example, 79% of college students rated themselves as proficient on their oral/written communication skills, while only 42% of employers felt the same (Bauer-Wolf, 2018). To date, these individual attributes have not been analyzed together to produce a smaller set of scales. This was the first research goal of this study, to factor analyze graduating business students' perceptions of their business school curriculum improving their corresponding individual attributes, resulting in a smaller set of new reliable and valid scales. The second goal of this study was to then test the relationships of these new scales to outcome variables. The outcome variables studied here were business student satisfaction and employment preparedness.

1.2 Describe Relevant Scholarship

College student satisfaction can positively affect their persistence towards graduation (Suhre, Jansen & Harshkamp, 2007; Tessema, Ready, & Yu, 2012). General measures of student satisfaction contain different components (Sampson, Leonard, Ballenger, & Colman, 2010) including: instruction, communication, assessment, leadership, teamwork, professionalism and respect/diversity. Components of business student satisfaction can include items focusing on satisfaction with one's core courses versus major courses versus overall degree (Maddox & Nicholson, 2008). Blau, Williams, Jarrell and Nash (2019) created a reliable three-item measure of business student satisfaction which incorporated these components. Employment preparedness, i.e., a student perceiving they have a skill set applicable to the current employment market, is also an important outcome to measure. In a Gallup (2018) poll of more than 32,000 United States college students across 43 randomly selected four-year colleges, only 34% of the students believed they would graduate with the skills and knowledge to be successful in the job market. Using a combined sample of engineering majors and agricultural majors, Qenani, MacDougall and Sexton (2014) measured college student self-perceived employability by asking one item "how confident are you that you will be employed right after graduation?" Their answers were combined into three response categories, 1 = not confident, 2 = somewhat confident, and 3 = very confident. They also measured demographic (e.g., gender) and school-related variables (e.g., GPA), as well as perceived preparation academic experience variables (e.g., teamwork, critical thinking, field specific skills, oral communication, written communication). These academic experience variables were measured on a two-point scale, 1 = not to somewhat prepared, 2 = well prepared. Quenani et al. (2014) found that GPA (3.0 and above), and gender (female), as well as critical thinking, oral communication, and field specific skills were significantly related to higher self-perceived employability. Using a sample of California Parks and Recreation Society managers, D'Eloia and Fulthorp (2016) asked respondents, "how can recent college graduates be better prepared for entry-level, full-time employment in municipal recreation agencies?" Using qualitative analysis responses were coded into three broad themes: experience (recreation related); interview skills (e.g., oral and written communication skills) and job awareness (e.g., position specifics and expectations). These above-cited studies report employment preparedness measures which are methodologically limited, e.g., only one item, collapsed response categories. Creating a new multi-item measure (scale) of perceived Employment Preparedness would allow for a reliability estimate. This study developed such a scale.

Prior research (Quenani et al., 2014) has tested the relationships of demographic (e.g., gender) and school-related (e.g., GPA) variables to employment preparedness. Business student satisfaction research (Blau et al., 2019) has also tested the relationships of demographic (e.g., gender, in-state resident) to satisfaction. Prior research on college student professional development engagement (Blau, Snell, Campbell, Viswanathan, Andersson & Lopez, 2014; Blau& Snell, 2013) suggested studying demographics (e.g., gender) and school-related variables (e.g., transfer status, GPA) in their model of college student professional development engagement.

1.3 Research Questions

Given the exploratory nature of this study, more general research questions, as opposed to specific hypotheses, were posed (Stevens, 1996). The three research questions (RQ) posed and tested were:

RQ1 – valid and reliable scales of student perceived curriculum-improved abilities can be developed

RQ2 – these curriculum-improved abilities' scales will each have a positive relationship to business student satisfaction and perceived employment preparedness

RQ3 – the student perceived curriculum-improved abilities will each explain significant business student satisfaction and perceived employment preparedness beyond controlled for demographic and school-related variables

2. Method

2.1 Participants and Procedure

An online Qualtrics survey link, called the Senior Student Satisfaction Survey (SSSS), was emailed to all Fall 2021 graduating undergraduate business students. The research site is a state-supported university business school in the Mid-Atlantic region of the United States. Complete data responses to the survey were given by 93 out of the 388 students emailed (24%). The University Institutional Review Board had approved the survey as part of a normal program evaluation.

2.2 Measures

Demographics. Three record-based variables were measured: gender, race and state residency. Gender was coded as 1 = male, 2 = female. Race was coded as 1 = Hispanic, 2 = Asian, 3 = White, 4 = African American, 5 = Multiracial. State residency was coded as 1 = in state, 2 = out of state.

School Background. Three record-based variables were measured: student overall Grade Point Average (GPA); transfer student (where 1 = transfer, 2 = no transfer), and major, i.e., curriculum major of student.

Curriculum-improved Abilities. Twelve items were asked using the following lead statement; "please rate your agreement that the Business School's Bachelor of Business Administration (BBA) curriculum improved my ability to:…." and each item was rated using a 7-point response scale from 1 = strongly disagree to 7 = strongly agree. The 12 items were taken from the learning goals of the Business School BBA and closely match the earlier mentioned NACE (2021) list of attributes employers seek on a graduating college senior's resume. These 12 items were factor analyzed and the results are reported below.

Student Satisfaction. A three-item scale, measuring satisfaction with core courses, major courses and degree program was used (Blau, Williams, Jarrell & Nash, 2019). A sample was "I am satisfied with my major courses." A 7-point response scale was used for each item, 1 = strongly disagree to 7 = strongly agree. The coefficient alpha (reliability estimate) for this scale using this sample was .78.

Employment Preparedness. A new two-item measure was used. The two items were: "the program helped me develop a skill set applicable to today's employment market, and "the program met my expectations." A 7-point response scale was used for each item, 1 = strongly disagree to 7 = strongly agree. The coefficient alpha (reliability estimate) for this scale using this sample was .76.

Open item. The following open item was asked at the end of the survey: "what do you believe could have improved your overall business school experience, including core and major courses?

2.3 Data Analyses

Exploratory factor analysis was used to test RQ1. Correlation analyses were used to test RQ2. Hierarchical regression analyses were used to test RQ3. Prior to using the regression analyses, race and major were recoded into binary variables, allowing for a stronger analysis and easier interpretation. SPSS (2021) was used for all analyses.

3. Results

3.1 Descriptive Sample Results

Table 1 below reports the descriptive sample results.

Table 1. Nominal Demographic and School Background Variables

Variable	(n = 93)
Gender	
Male	n = 50 (54%)
Female	n = 43 (46%)
Race	
Hispanic	n = 7 (8%)
Asian	n = 22 (24%)
White	n = 46 (49%)
African American	n = 11 (12%)
Multiracial	n = 7 (8%)
State Residency	
In State	n = 73 (78%)
Out of State	n = 20 (22%)
Transfer Student	
Transfer	n = 51 (55%)
No Transfer	n = 42 (45%)
Major	
Accounting	n = 8 (9%)
Actuarial Science	n = 4 (4%)
Business Management	n = 14 (15%)
Economics	n = 2 (2%)

Entrepreneurship	n = 2 (2%)
Finance/Financial Planning	n = 21 (23%)
Human Resource Management	n = 3 (3%)
International Business	n = 1 (1%)
Management Information Systems	n = 3 (3%)
Marketing	n = 13 (14%)
Real Estate	n = 2 (2%)
Risk Management and Insurance	n = 14 (15%)
Statistics/Data Analytics	n = 1 (1%)
Supply Chain Management	n = 5 (5%)

The highest frequency categories for each variable were: male (54%); White (49%); In State (78%); Transfer (55%) and Finance/Financial Planning Major (23%).

3.2 Testing Research Question (RQ)1

Exploratory Factor Analysis (EFA) was used to test RQ1, i.e., valid and reliable scales of student perceived curriculum-improved abilities can be developed. The subjects to items ratio of 93:12 (7.8:1) was adequate, and items with a loading of at least .50 were noted (Stevens, 1996). Table 2 below presents the results. Three items, #1, 2 and 10 were deleted due to double loading issues. Deletion is noted for these items. Nine items were retained, resulting in two name factors (items contained): *Professional Development* (item #s 3, 7, 8, 9, 12) and *Quantitative Skills* (item #s 4, 5, 6, 11).

Table 2. Exploratory Factor Analysis for 12 Curriculum-improved Ability Items Using a Two-factor Extraction and Varimax Rotation

The Business School BBA curriculum improved my ability to: [a]	1[b]	2[b]
1. Apply a core body of discipline-specific knowledge to business problems[c]	**.67**	**.56 (deleted)**
2. Use integrated business knowledge to identify problems, generate solutions[c]	**.66**	**.51 (deleted)**
3. Understand the ethical, legal, and social responsibilities of individuals and organizations	**.72**	.38
4. Apply quantitative analysis and interpretations to business problems	.47	**.75**
5. Use quantitative data to analyze business decisions	.41	**.78**
6. Use software to analyze and implement business decisions	.23	**.90**
7. Effectively present ideas in writing	**.86**	.26
8. Effectively present ideas orally	**.78**	.23
9. Effectively present ideas visually	**.70**	.42
10. Effectively work in teams[c]	**.56**[c]	.47 **(deleted)**
11. Technical abilities and skills (i.e., use of technology, software) relevant to your discipline	.33	**.78**
12. Professional development (i.e., development of networking, interviewing, leadership skills)	**.70**	.31
Initial Eigenvalues[b]	7.54	.95
Percentage of variance accounted for	63%	8%
Variance Accounted for after Varimax Rotation	38%	33%

Note. N = 93.

[a] Responses using 7-point scale: 1 = strongly disagree to 7 = strongly agree.

[b] Factor 1 = Professional Development; Factor 2 = Quantitative Skills

[c] Items #1, 2 & 10 were deleted due to double loading issues

*factor loadings above .**50 bolded**

Using these results, two new curriculum-improved abilities scales were created: Professional Development (5 items), alpha = .88; and Quantitative Skills (4 items), alpha = .91. These results provide support for *RQ1*.

3.3 Testing Research Question (RQ)2

Table 3 presents the results for testing *RQ2*, these curriculum-improved abilities scales will each have a positive relationship to business student satisfaction and perceived employment preparedness.

Table 3. Means, Standard Deviations and Correlations of Continuous Study Variables

Variable Name	M	SD	1	2	3	4	5
1. GPA[a]	3.22	.35	(----)				
2. Professional Development[b]	4.39[c]	1.78	-.09	(----)			
3. Quantitative Skills[b]	4.71[c]	2.02	-.08	.72**	(----)		
4. Student Satisfaction[b]	4.67	1.88	-.13	.59**	.61**	(----)	
5. Employment Preparedness[b]	4.49	2.04	-.03	.51**	.56**	.62**	(----)

Note. N = 93. * $p < .05$; ** $p < .01$ (both two-tailed)

[a] GPA (grade point average), based on a 4-point scale

[b] Professional Development, Quantitative Skills, Student Satisfaction, Employment Preparedness, 1 = strongly disagree to 7 = strongly agree

[c] Significant Difference between Quantitative Skills and Professional Development, $t(92) = 2.19$, $p < .04$

Looking at the variable means first, the four scales, Professional Development, Quantitative Skills, Student Satisfaction, and Employment Preparedness, they are all slightly above average. However, students perceived the curriculum improved their Quantitative Skills abilities (M =4.71) significantly more than their Professional Development abilities (M =4.39), $t(92) = 2.19$, $p < .04$. Correlation results show that although Professional Development and Quantitative Skills overlap ($r = .72$, $.72^2 = 52\%$), there is enough unshared variance (48%), combined with the factor analyses, that they can be used as distinct variables (Stevens, 1996). The correlation between Student Satisfaction and Employment Preparedness was significant ($r = .62$). However, these scales also demonstrated enough unshared variance ($1 - .62^2 = 62\%$) to be further separately analyzed as outcome variables. GPA did not have a significant correlation to any continuous variable. As shown in Table 3, both Professional Development and Quantitative Skills were significantly positively related to Student Satisfaction and Employment Preparedness. These results support *RQ2*.

3.4 Testing Research Question (RQ)3

Table 4 presents the results for testing *RQ3*, i.e., the student perceived curriculum-improved abilities will each explain significant business student satisfaction and perceived employment preparedness beyond controlled for demographic and school-related variables. Prior to using the regression analyses, race and major were recoded into binary variables, allowing for a stronger analysis and easier interpretation (Stevens, 1996). Race was recoded into 1= White (46%), 2 = Non-white (54%). Major was recoded into 1 = Quantitative majors (63%), 2 = Qualitative majors (37%). Following Blau, Pred, Drennan and Kapanjie (2016), Quantitative majors were represented by: Finance/Financial Planning, Accounting, Risk Management and Insurance, Management Information Systems, Actuarial Science, Economics, Statistics/Data Analytics, and Supply Chain Management. Qualitative majors were represented by: Marketing, Business Management, Human Resource Management, International Business, Entrepreneurship, and Real Estate. The N to K (respondents to predictors) ratio of 93:8 = 11.6:1 was adequate for performing the hierarchical regression analyses (Stevens, 1996). The final model for Business Student Satisfaction was significant, $F(8,80) = 8.49$, $p < .01$, with 46% of the variance accounted for (41% adjusted R^2). The final model for Employment Preparedness was significant, $F(8,80) = 5.97$, $p < .01$, with 37% of the variance accounted for (31% adjusted R^2). As shown below, the Quantitative Skills curriculum-improved ability scale was a consistently significant antecedent for both Business Student Satisfaction ($b = .34$, $p < .01$) and Employment Preparedness ($b = .40$, $p < .01$). The Professional Development curriculum-improved abilities scale was a significant antecedent for only Business Student Satisfaction ($b = .35$, $p < .05$). In addition, In State residency was a significant antecedent of Business Student Satisfaction ($b = -.86$, $p < .05$). Overall, these results provide partial support for *RQ3*.

Table 4. Final Hierarchical Regression Model for Incrementally Testing the Contributions of Demographic, School-related and Perceived Curriculum-improved Abilities Sets for Explaining Business Student Satisfaction and Employment Preparedness

Outcomes	Student Satisfaction[f]				Employment Preparedness[f]			
	b	SE	R^2	Change R^2	*b*	SE	R^2	Change R^2
Step 1: Demographic Variables					-.34	.38		
Gender[a]	.19	.33			-.33	.39		
Race[b]	.44	.34			.11	.47		
State Residency[c]	-.86*	.41					.02	
			.03					
Step 2: School-related Variables								
GPA	-.29	.49			.17	.56		
Transfer Student[d]	.23	.33			-.01	.37		
Quantitative/Qualitative Major[e]	-.32	.34			-.57	.39		
			.08	.05			.05	.03
Step 3: Curriculum-improved Abilities								
Professional Development[f]	.35*	.14			.25	.16		
Quantitative Skills[f]	.34**	.12			.40**	.13		
			.46**	.38**			.37**	.32**

Note. N = 93. *b* is unstandardized regression weight, SE = standard error; *p < .05, **p < .01; all two-tailed.

[a] Gender, 1 = male, 2 = female; [b] Race, 1= White, 2 = Non-white; [c] State Residency, 1 = In State, 2 = Out of State; [d] Transfer Student, 1 = Transfer, 2 = No Transfer; [e] Quantitative/Qualitative Major, 1 = Quantitative, 2 = Qualitative; [f] Professional Development, Quantitative Skills, Student Satisfaction, Employment Preparedness, 1 = strongly disagree to 7 = strongly agree.

3.5 Open Item Results

At the end of the survey, students were asked: "what do you believe could have improved your overall business school experience, including core and major courses? The highest frequency of responses could be grouped around the pandemic and so many classes going online: e.g., "no COVID-19, I learn better in class, not online"; "if we didn't go online"; "being in person"; "obviously COVID put a damper on my final two years in the business school"; "controlling the cost of tuition, especially with classes going online"; "online university did ruin my experience"; and "I did not enjoy, nor learn from, my online courses."

4. Discussion

To the authors' knowledge, this is the first empirical attempt to convert into scales prior lists of individual attributes employers seek on college student resumes (NACE, 2021) or corresponding student versus employer preparedness/proficiency evaluations on these attributes (Bauer-Wolf, 2018; Jaschik, 2015). Two new curriculum-improved abilities scales were developed, Professional Development (5 items) and Quantitative Skills (4 items). These scales were found to be reliable and sufficiently distinct from each other. In addition, a new short multi-item, reliable Employment Preparedness scale was developed. This new scale advances prior research on employment preparedness which used one-item, limited response scale measures (D'Eloia & Fulthorp, 2016; Quenani et al., 2014). The results found with all these new scales should be considered exploratory and additional scale testing is recommended, for further validation.

Graduating business students perceived that the Quantitative Skills curriculum scale improved their abilities more than the Professional Development curriculum scale. In addition, the Quantitative Skills scale significantly explained both Student Satisfaction and Employment Preparedness beyond controlled for demographic and school-related variables, while the Professional Development scale only explained Student Satisfaction. Both curriculum-improved abilities scales are important for student development, and efforts should be continued to monitor student evaluative perceptions, particularly in courses specifically designed in the curriculum to address

these abilities. However, by grouping these individual abilities into broader scales, research efforts linking these scales to outcome variables will be more efficient.

It is worth noting that five of the six record-based demographic and school related variables, i.e., gender, race (recoded), GPA, transfer student, and quantitative/qualitative major (recoded), did not have a significant relationship to either student satisfaction or employment preparedness. These encouraging results indicated that such variables were not adversely affecting either outcome. Only state residency had a relationship to student satisfaction, i.e., in-state residents perceived higher satisfaction. One speculative reason for this result is that in-state students pay a much lower tuition to attend the business school.

4.1 Study Limitations

The survey had a very low (24%) complete data participation rate. The Fall survey for graduating seniors has a much smaller population than the corresponding Spring survey. Student responses to the open item suggested that the pandemic could have also contributed to the lower-than-desired sample size. With only 93 complete-data respondents, both the race and major variables needed to be recoded into broader categories for analyses. Although adequate (Stevens, 1996), a larger sample size would have increased confidence in the exploratory factor analysis results. No data were collected for student internship experiences, which research has shown can help with student professional development and anticipated employment (Blau & Lopez, 2020). The cross-sectional research design does not allow for inferring cause-effect relationships.

4.2 Future Research and Conclusion

Future research could try to incorporate potential indicators of intelligence (e.g., SAT scores), which prior study has shown can indicate college student job potential (Chamorro-Premuzic, 2019). Chin, Blackburn Cohen and Hora (2020) found that college students using career information resources (e.g., from the career services center) increased their psychological readiness for employment. Using college student samples across five disciplines, i.e., natural and physical sciences, health, education, business, and society and culture, Ferns, Russell and Smith (2015) found that specific curriculum design factors (e.g., activities focused on applying discipline knowledge in the workplace) were correlated with students' satisfaction, aligned with students' expectations, and had an impact on students' perceived employability. Collectively these studies suggest future variables to test. The present study consisted of full-time business undergraduates at a large, state-supported United States (US) urban university. To test the generalizability of results found here, including the continued psychometric support of the new scales found, different college student samples need to be studied, e.g., non-business, private college. It is hoped that the results found in this exploratory research will merit future investigation.

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