Abandoning the Liberal Arts? Liberal Arts Learning Outcomes of Professional Majors*

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Introduction

Liberal arts colleges are a foundational and integral piece of American higher education. Liberal arts colleges were the United States' first type of higher education institution, beginning with Harvard's founding in 1636, and they continue to play a key role in postsecondary education (Thelin, 2004). Breneman (1994) states his belief that "At their best… private liberal arts colleges provide the finest undergraduate education available in this country" (p. 4). Yet today, the status of the liberal arts is under examination. Enrollment has declined at liberal arts colleges, and these campuses must now compete against one another, and against low-cost public colleges and universities, for student enrollment (Breneman, 1994; Jaquette, 2013; Kraatz & Zajac, 1996). To effectively compete for students, liberal arts colleges have met student demands, introducing new vocational and professional academic programs. These programs are a departure from the traditional liberal arts college, which has not prepared students for particular careers (Breneman, 1990).

This study attempts to answer whether the adoption of professional programs at a liberal arts college represents a fundamental change in the liberal arts mission or an attempt to protect the liberal arts mission against economic realities. To examine this question, we evaluate differences in liberal arts learning outcomes among students enrolled in professional majors (e.g. engineering, nursing, education) at liberal arts colleges as compared with students enrolled in liberal arts majors (King, Kendall Brown, Lindsay, VanHecke, 2007). Findings from this study suggest that a student's academic major field category – liberal arts vs. professional/vocational – is not a significant predictor of gain on most of the liberal arts student learning outcomes. These findings propose important implications for future discussion and research. We conclude this

paper by discussing these implications and considering whether new curricular additions represent a dangerous threat to the persistence of the liberal arts curriculum.

Background

Liberal arts colleges have traditionally worked to cultivate good citizens through a heavy focus on teaching in the liberal arts disciplines. These disciplines comprise the social sciences, humanities, fine arts, natural sciences, and physical sciences (Breneman, 1994; Delucchi, 1997). Curriculum is indeed a core component of liberal arts colleges. A departure from the liberal arts curriculum therefore represents divergent change, not aligned with the liberal arts mission. By focusing on core disciplines, liberal arts colleges intend to prepare students for a life of meaning and purpose with a set of broad skills that are adaptable in shifting contexts (King et al., 2007). Preparing students with a set of vocational skills typically associated with professional majors runs contrary to the mission of a liberal arts college.

Liberal arts colleges, instead, support a series of broad undergraduate learning outcomes through a rigorous focus on teaching in small classroom settings on a residential campus (Breneman, 1990). These outcomes, outlined later in this study, do not directly include vocational skills (King at el., 2007). Liberal arts learning outcomes comprise a broad set of generalizable skills that equip students to adapt to a changing world. The question then arises: can a college that adopts professional majors still effectively promote liberal arts learning outcomes? The current study hopes to determine if these colleges are able to protect their core liberal arts mission by adding vocational and professional programs or if they are in fact subverting their mission.

The Liberal Arts College Under Threat

The liberal arts curriculum has slowly and steadily evolved over time. Originally centered in classical studies, the liberal arts curriculum eventually expanded to include the natural, physical, and social sciences (Thelin, 2004). These new disciplines have gained wide acceptance as components of the liberal arts curriculum, but their inclusion was not without resistance. The Yale Report of 1828 staunchly defended the storied university's commitment to the traditional liberal arts while allowing room for some gradual change over time (Committee of the Corporation and the Academical Faculty, 1828; Pak, 2008). By 1828, however, even Yale had included new disciplines into its liberal arts curriculum.

Despite steady change, programmatic expansion at liberal arts colleges has led to broad declarations that the liberal arts curriculum is under threat. Today, liberal arts colleges face new environmental challenges and external threats. In the face of declining enrollments, more and more liberal arts colleges have adopted professional and vocational programs, and many small colleges have become comprehensive universities (Breneman, 1994; Jaquette, 2013; Kraatz & Zajac, 1996; Morphew, 2002). These developments have caused increasing concern among scholars and pundits. Many op-eds and articles in newspapers and magazines raise concern about the declining status of the liberal arts (e.g. Baldwin & Baker, 2009; Fish, 2010; Howard, 2011). Even before the present outcry, scholars in the 1970's and 1980's predicted that many small, non-elite liberal arts colleges would fail and shut their doors. Increased competition from low-tuition public colleges and universities and a declining population of traditional-aged students compressed strains on liberal arts colleges (Breneman, 1994).

Dire predictions of broad organizational death never came to fruition. Liberal arts colleges changed their strategies and tactics in order to bolster financial resources and

enrollments. To attract more students, many small liberal arts introduced new professional and vocational majors (Breneman, 1994; Kraatz & Zajac, 1996). These newer professionally-oriented majors aimed to appeal to student demands. Colleges have since used professional majors to attract more applicants and to shore up enrollments amidst tough competition for students. Although this strategy to attract more students is beneficial for small liberal arts colleges' financial stability, it may come at the expense of the college's traditional mission (Jaquette, 2013).

Empirical research confirms that liberal arts colleges have adopted professional programs in order to increase their stability. Morphew (2002) finds that less prestigious colleges are more likely than their higher-prestige counterparts to add programs and become universities. Jaquette (2013) finds that liberal arts colleges facing declining enrollments have been more likely to become comprehensive universities, and growing into a university is associated with prior adoption of professional programs. Colleges expanded their programs and changed their names to enter into new prestige market in order to compete against other comprehensive universities instead of against elite liberal arts colleges.

Kraatz and Zajac (1996) hypothesized that liberal arts colleges pursuing divergent change, such as adopting professional programs, would ultimately fail and close. Adopting professional programs should delegitimize liberal arts colleges in the eyes of external constituents, leading to organizational death. Contrary to their hypothesis, the researchers found that these colleges successfully attracted additional enrollment and bolstered their financial strength. As a result of successful curricular expansions, many colleges now sit somewhere in between the liberal arts mission and the comprehensive mission. These colleges have expanded their mission to include professional and vocational majors, but continue to maintain a small

campus size and commitment to teaching. Breneman (1994) labels these colleges baccalaureate, rather than liberal arts.

Divergent Change at Liberal Arts Colleges

The liberal arts mission described in this literature review provides a template for organizational traits at liberal arts colleges. Any change away from this organizational template is considered divergent change (Jaquette, 2013). In the context of liberal arts colleges, change away from the liberal arts curriculum and away from the small, residential campus represents divergent change. Expanding class sizes or offering online education are two examples of divergent change. Adding professional and vocational majors additionally represents divergent change and mission drift away from the liberal arts organizational template.

A liberal arts college's organizational claim to be a liberal arts college may therefore be at odds with its internal practices. Liberal arts colleges in this instance de-couple their organizational claims from their technical core (Delucchi, 2000). Liberal arts colleges maintain their claims that they provide a liberal arts education, but change their practices to offer professional and vocational majors in order to attract a broader enrollment pool.

Continuing to claim a liberal arts mission allows liberal arts colleges to satisfy external demands for legitimacy. Institutional theory proposes that as long as colleges communicate to external constituencies through mission statements and other symbols that they are a liberal arts college, they will be free to pursue divergent actions (Meyer & Rowan, 1977). Broad conceptions of what constitutes a liberal arts college (small class size, residential education, liberal arts curriculum) define the legitimating structures a campus must have in place in order to survive (DiMaggio & Powell, 1983). Without declaring a liberal arts mission, pursuing

divergent change might delegitimize a liberal arts college and ultimately lead to organizational failure.

One could therefore predict that liberal arts colleges that are moving away from their traditional mission by adopting professional and vocational programs would fail. This hypothesis guided Kraatz and Zajac's (1996) study that analyzed the health of liberal arts colleges pursuing divergent change. Kraatz and Zajac found, however, that divergent change did not delegitimize liberal arts colleges and in fact often led to improved financial strength. They propose that technical environmental drove college actions, specifically increasing student demands for professional and vocational programs. Responding to technical pressures, however, did not free colleges from institutional legitimacy constraints. Economic pressures may instead be translated through organizational identity. This idea is rooted in Selznick's (1957) old institutionalism. The decision to introduce a professional must fit within the constraints of a college's identity. A professional major at a liberal arts college, then could look very different from a professional major at a comprehensive university.

Protecting the Core

The addition of professional and vocational programs to a liberal arts college could indeed represent divergent change and a real threat to the liberal arts. In order to improve financial stability while satisfying legitimacy demands, liberal arts colleges can outwardly declare a liberal arts mission while adopting professional and vocational programs in order to address. Delucchi (1997) argues that liberal arts colleges demonstrate enormous inconsistency in their mission statements. He finds a vast gap between stated liberal arts missions and actual practices within liberal arts colleges.

We, however, consider that the addition of professional programs could represent colleges' attempt to protect their liberal arts mission. Unlike Morphew (2002) and Jaquette (2013), the current study analyzes colleges that have not made the leap to becoming universities. While the colleges could become universities in the future, one could also conceive that these institutions are attempting to remain small, residential campuses. Adding professional programs could be the best opportunity to protect against any further mission creep. These colleges are not attempting to compete in a new prestige market and could instead be attempting to protect their core liberal arts mission by adding professional programs.

Colleges are better able to provide residential education and small class sizes by drawing on the financial resources that are available thanks to professional and vocational programs. Adding these programs allows colleges to pursue their mission rather than close their doors. This idea suggests a resource dependence framework as opposed to an institutional framework (Pfeffer & Salancik, 1978). Students provide crucial tuition dollars that allow a college to keep the lights on, and colleges must therefore attract students. Adopting professional programs then, at a base level, demonstrates an attempt to prolong the college's survival and protect their mission. Said another way, a college's attempts to attract students in fact allows the college to protect its technical core rather than subvert the technical core.

Colleges are able to satisfy legitimacy demands by implementing professional and vocational programs within the liberal arts context (Delucchi, 1997). Even though a liberal arts college could now teach business, instruction may still occur on a small, residential campus. The college may also satisfy the demands of the liberal arts template by requiring a robust general education curriculum. Professional programs constrained by the liberal arts mission can could

therefore satisfy technical environmental demands (student enrollments) and institutional environmental demands (legitimacy).

Zemsky, Wegner, and Massy (2005) summarize this strategy as being market-smart and mission-centered. Colleges face financial pressures and must enroll students. At the same time, colleges are mission-driven organizations that purport and attempt to accomplish specific goals, such as research, learning, or service. Colleges can balance these competing pressures by offering financially profitable programs and using revenues to subsidize core mission programs that operate at a loss. Divergent change may therefore represent an attempt to preserve the liberal arts mission rather than an attempt to subvert it in the pursuit of greater resources or prestige.

One way to find out whether or not divergent change is subverting the liberal arts technical core is to investigate a college's liberal arts learning outcomes. Institutional theory proposes that technology at colleges (teaching) is uncertain. There is no best, most efficient way to teach as there often is to produce goods in a factory. Outcomes (learning) are similarly hard to measure and to define (Meyer & Rowan, 1977; Weick, 1976). There are questions over what the outcomes should be and how to measure them.

The liberal arts organizational template, however, places constraints on teaching and outcomes. Teaching should take place in small classes, and students should be integrated into a residential campus. Teaching is additionally focused in liberal arts disciplines. Outcomes focus on broad skills like critical thinking and moral development, rather and occupation-specific skills. One could therefore reasonably expect that changing the core technology to include professional programs should lead to changed outcomes. This expectation leads to the

hypothesis that students enrolling in professional programs should experience diminished gains in liberal arts learning outcomes.

A resource dependence claim proposes just the opposite. Offering professional programs represents an attempt to protect the technical core, not divergence from the organizational template. Students in all majors would therefore experience the same liberal arts learning outcomes gains over the course of their college careers. Colleges use increased revenues to support and preserve organizational characteristics that promote these liberal arts learning gains. Colleges additionally implement professional programs within the constraints of a liberal arts mission.

Our study focuses on small colleges claiming a liberal arts mission. While some of these colleges have added professional and vocational programs, all have maintained small student bodies and commitment to residential education. Jaquette (2013) calls for research assessing the effects of shifting missions and organizational templates. This study is an attempt to meet that call. We ask if it is possible for liberal arts colleges to introduce professional and vocational programs while maintaining their commitment liberal arts learning outcomes. Asked another way, have financial pressures eroded colleges' commitments to the liberal arts, or has it led colleges to find alternative strategies to protect this mission?

Methods

The current study draws data from the Wabash National Study of Liberal Arts Education (WNS), a national, longitudinal, pretest/posttest design study that examines the effects of liberal arts college experiences on a variety of liberal arts student learning outcomes. The WNS institutional sample includes three cohorts (2006-2010, 2007-2011, and 2008-2012) of students from institutions varying in selectivity, size, geographic region, and control. Liberal arts

colleges were purposefully oversampled for the purposes of WNS. The current study's institutional sample consisted of 28 four-year liberal arts colleges that participated in any of the three institutional cohorts.

Student-level data collection occurred at three intervals for each cohort. Initial data collection occurred in the fall semester of the students' first year of college (fall 2006, 2007, 2008). During initial data collection, student demographic information and precollege characteristics and experiences were collected, along with precollege levels of a variety of both cognitive and affective liberal arts student-learning outcomes. At the end of the students' first year of college (spring 2007, 2008, 2009), the first follow-up data collection occurred. During this first follow-up data collection, college experiences were collected from the first year, as well as end-of-first-year levels of the same liberal arts student learning outcomes collected during the first data collection. The final data collection occurred during the spring semester of the students' fourth year of college (spring 2010, 2011, 2012). The final follow-up data collection collected college experiences over four years of college, as well as the end-of-fourth-year levels of the same liberal arts student-learning outcomes collected during the first two intervals of data collection. During both follow-up data collection intervals, students completed both the WNS Student Experiences Survey (WSES) and the National Survey of Student Engagement (NSSE). Students who participated in the 2006 WNS cohort were given $50 for each data collection interval, while students who participated in the 2007 or 2008 were not compensated for participating in the WNS. All data collection for the WNS was conducted by ACT.

Dependent Measures

We included the following outcome measures in our study: critical thinking, moral reasoning, inclination to inquire and lifelong learning, intercultural effectiveness, psychological

well-being, and leadership. We chose these six outcomes as dependent variables for the current study, as we sought to investigate if academic discipline had an influence on student learning and development at liberal arts colleges. It is important to note that students completed each of these outcome measures at all three data intervals, with the exception of students completing either the measure for critical thinking or for moral reasoning. This decision was made because of time required to complete these measures and is the reason for the corresponding lower sample sizes for the models corresponding to these two outcome measures. All of our dependent measures are from the second follow-up data collection, at the end of the students' fourth year of college.

Critical Thinking

The Collegiate Assessment of Academic Proficiency (CAAP) was the measure for critical thinking. The CAAP was developed by the American College Testing Program (ACT) and measures the ability of students' to interpret, analyze, assess, and extend arguments. The CAAP is a 32-item scale that has internal reliability consistencies ranging from 0.81 to 0.82 (ACT, 1991).

Moral Reasoning

The N2 score of the Defining Issues Test-2 (DIT-2) was the measure for moral reasoning. The DIT-2 was developed to measure students' level of moral reasoning by responses to social dilemmas. The DIT-2 has internal reliability consistencies ranging from 0.74 to 0.77 (Rest, Narvaez, Thoma, & Bebeau, 1999).

Inclination to Inquire and Lifelong Learning

We used two measures to capture inclination to inquire and lifelong learning: the Positive Attitude toward Literacy (PATL) scale and the Need for Cognition Scale (NCS). The PATL was developed to measure levels of enjoyment and pleasure in a variety of literacy-related activities,

such as reading and writing poetry. The PATL is a six-item scale that has an internal consistency reliability of 0.71. The NCS measures students' "tendency to engage in and enjoy effortful cognitive activity" (Cacioppo, Petty, Feinstein, & Jarvis, 1996, p. 197). The internal consistency reliabilities for the NCS range from 0.83 to 0.91 (Cacioppo et al., 1996).

Intercultural Effectiveness

We used two measures to capture intercultural effectiveness: the Openness to Diversity/Challenge Scale (ODC) and the Miville-Guzman Universality-Diversity Scale (M-GUDS). The ODC was developed to measure levels of enjoyment in students' interactions with diverse peers and challenge faced regarding diverse perspectives and views (Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1996). The ODC is a seven-item scale that has an internal consistency reliability that ranges from 0.83 to 0.87. The M-GUDS measures "an awareness and potential acceptance of both similarities and differences in others that is characterized by interrelated cognitive, behavioral, and affective components" (Fuertes, Miville, Mohr, Sedlacek, & Gretchen, 2000, p. 158). This awareness is Universality-Diversity orientation (UDO). The M-GUDS is a 15-item scale with an internal consistency reliability of 0.85.

Psychological Well-Being

The overall mean score for the Ryff Scales of Psychological Well-Being (RYFF) was used to measure various levels of psychological well-being. The RYFF is a 54-item scale that has an internal consistency reliability of 0.88.

Leadership

The overall mean score for the Socially Responsible Leadership Scale (SRLS) was the measure used to capture leadership. The SRLS measures eight areas of the Social Change Model

(see Astin, A., Astin, H., Boatsman, Bonous-Hammarth, Chambers, Goldberg, et al., 1996; Dugan, 2006). The SRLS is a 68-item scale with an internal consistency reliability of 0.92.

Independent Measures

Our independent variable of interest is academic major. We dichotomized the variable for major into professional majors versus traditional liberal arts majors. We coded the variable (1 = professional majors: business, education, engineering, and professional; with 0 = arts and humanities, biological sciences, physical sciences, social sciences, and other). (Note: We ran the analyses with "other" included and with "other" not included. There were no statistically significant differences between the two samples. We therefore decided to leave the 161 students who reported "other" major within the sample.) Precollege covariates include: race (three dichotomized variables – Black, Asian, and Hispanic (with White serving as the omitted category for all three variables), gender (male versus female), ACT Composite Score or SAT equivalent (coded as a continuous measure), first generation college status (dichotomized first generation college status versus continuing generation college status, with first-generation status being defined as having neither parental education completed a four-year college degree), high school GPA (coded as a continuous variable), precollege educational aspirations (coded as a continuous variable), and precollege academic motivation (eight-item continuous measure ranging from 1 = low academic motivation to 5 = high academic motivation, $\alpha = 0.74$).

We included a variable for institutional selectivity, which was created using the institution's mean ACT Composite Score. We also included variables indicating in which cohort the institutions participated and if institutions participated in more than one cohort of the WNS. We additionally included four college-level covariates in our models: membership in an academic honors program (dichotomized membership versus no membership), co-curricular

involvement (coded as a continuous variable, defined by hours spent per week on co-curricular activities), fourth-year level on the professional/career success scale (five-item continuous measure illustrating students' desire to accomplish career or professional success, $\alpha = 0.74$), and meaningful interactions with diverse peers (three-item continuous measure capturing the level of positive interactions with diverse peers students have had over their four years of college, $\alpha = 0.83$).

We included a final control variable for completion of the first follow-up or second data collection interval. We included this dichotomous control to account for the number of times students' completed the liberal arts learning outcomes. For example, based on the variables we included in our models, students could have participated in the first data collection and the final data collection, but not the second data collection. This variable allowed us to control for whether students participated three times or two times. Approximately 33 percent of our sample participated in the first and third data collection intervals, but did not participate in the second data collection interval.

Analyses

We computed series of ordinary least squares (OLS) regressions for each of the eight dependent measures. We standardized all continuous measures. The student-level data sample for the current study varied from 1,202 to 2,617 total studentss after we completed listwise deletion for each of the outcome measures. In order to check for issues of multicollinearity within our regression models, we computed two post-estimation tests. First, we computed a correlation matrix between the independent variable of interest and the covariates. The correlation matrix is illustrated in Table 1.

Insert Table 1 here

As illustrated in Table 1, none of the variables seem to be worrisome for multicollinearity issues. The largest correlation was between ACT Composite Score and Institutional Selectivity (r = 0.62), however given how this variable was created, this was expected. Additionally, we computed the variance inflation factors (VIFs) for each model. The VIFs ranged from 1.20 to 2.15. None of the VIFs reached Allison's (1999) conservative threshold of 2.5 nor did any come close to the less conservative threshold of 10.0 (see Stevens, 2002). We were able to control for the nested nature of the study by using the "svy" command in STATA. Interpretations for statistical significance were therefore based on alpha levels of 0.05, 0.01, and 0.001.

Results

We computed descriptive analyses to compare the two main groups our study (students majoring in professional disciplines versus students majoring in traditional liberal arts disciplines). These descriptive analyses are illustrated in Table 2.

Insert Table 2 here

As highlighted in Table 2, the majority of the sample majored in a traditional liberal arts academic discipline (88%) rather than in a professional field (12%). When examining the sample means for the pretest and posttest levels of the student learning outcomes, the sample of students majoring in professional fields had higher growth between T1 and T3 for seven of the eight outcomes, including: critical thinking, moral reasoning, need for cognition, both measures for intercultural competence, psychological well-being, and socially responsible leadership. The subsample of students majoring in traditional liberal arts academic disciplines had an overall mean growth from T1 to T3 higher than their peers for positive attitude toward literacy. The sample is largely white, female, and continuing-generation college student status.

Results from the regression analyses are summarized in Table 3. We found that professional academic majors (when compared to traditional liberal arts academic majors) did not have a statistically significant different effect on six of the eight outcome measures (CAAP, DIT-2, NCS, MGUDS, ODC, and RYFF). This suggests that the growth in these outcomes – critical thinking, moral reasoning, need for cognition, intercultural effectiveness, and psychological well-being – over four years does not differ by major at liberal arts colleges.

Insert Table 3 here

Professional major (when compared to traditional liberal arts academic major) was a significant predictor for positive attitude toward literacy (PATL) and socially responsible leadership (SRLS). Students who majored in professional disciplines had on average a 0.22 decrease in PATL compared to their peers who majored in traditional liberal arts majors, holding all other variables constant ($p < 0.001$). Students who majored in professional disciplines had on average a 0.13 increase in SRLS compared to their peers who majored in traditional liberal arts majors, holding all other variables constant ($p < 0.01$). These findings suggest that students majoring in professional majors are having fewer gains in positive attitudes toward literacy and greater gains in socially responsible leadership than their peers majoring in traditional liberal arts academic majors.

Discussion

These findings suggest that students enrolled in professional majors at liberal arts colleges do not experience decreased gains in educational outcomes after four years in college except in their positive attitude toward literacy. Students in professional majors are conversely more likely than traditional liberal arts majors to experience higher gains in socially responsible leadership over four years of college. Non-findings in four of six outcomes suggest that

academic major is not the most important factor for students' attainment of liberal arts learning outcomes.

Our results support the resource dependence framework's predictions. Rather than abandoning the liberal arts mission, colleges appear to buffer their mission against external economic pressures. Breneman (1994) discusses the unique features of a liberal arts college, including its small size, focus on teaching, selective admissions, and residential campus. These features of a liberal arts education seem integral to educational outcomes at a liberal arts college. Expanding programmatic offerings to include professional majors may in fact protect these components of a liberal arts education. Colleges, rather than having to increase class sizes or the student body size in the face of economic challenges, are able to maintain their small, residential qualities.

We agree with Breneman (1990) and Delucchi (2000) that the liberal arts curriculum is an equally important component of a liberal arts education. A focus on traditional disciplines is important for the benefit of students and more generally for the general benefit of society. Colleges play a crucial role in defending the liberal arts and passing on disciplinary traditions through their students. Certainly, some campuses that introduce professional programs become comprehensive universities. These universities may expand their student bodies and grow class sizes, ultimately adopting a comprehensive university organizational template. We propose, however, that adopting professional and vocational programs can represent an attempt to protect the liberal arts against changing student demands and other environmental pressures. Colleges can use revenues generated from professional and vocational programs to subsidize, protect, and strengthen their disciplinary offerings (Zemsky, et al., 2005).

Research on change processes at liberal arts colleges could provide further insight into motivations for change. Researchers could better ascertain whether or not change was indeed driven by a desire to protect core tenets of the liberal arts college. Improved understanding of change processes could also lead to case comparisons with colleges that did ultimately become universities. Future research could highlight differences between these change processes that ultimately led to different outcomes.

Liberal arts colleges may therefore implement professional and vocational programs that are largely aligned with the liberal arts organizational template. The only differences in outcome gains by major included a gain in positive attitude toward literacy for liberal arts majors and a positive gain in socially responsible leadership for professional majors. These findings could suggest a difference in curricular focus and content for professional and liberal arts majors. This study does not evaluate the administration of different major types, and further analysis could reveal features of each major type that lead to varied outcome gains. Studying program implementation could additionally shed understanding on what components of the curriculum lead to our non-findings.

Because this study focuses on liberal arts colleges, the sample size of professional majors is small. Further analysis could include samples from baccalaureate colleges and comprehensive universities with greater proportions of professional students. Significant differences in liberal arts learning outcomes between professional and liberal arts majors at other college and university types would provide evidence that professional programs at liberal arts colleges are substantively different. We indeed hypothesize that at colleges and universities that provide professional programs outside of the liberal arts organizational template, students in professional majors will experience decreased growth in liberal arts learning outcomes.

Research on program implementation and research comparing different types of colleges and universities may demonstrate that professional programs can exist within the liberal arts organizational template. If this is the case, then the introduction of professional programs could represent evolution in the liberal arts organizational template. The liberal arts have expanded and changed since Harvard's founding in 1636 and since the Yale faculty issued their report in 1828. The liberal arts, once comprising only the classics, now include social sciences, modern languages, natural sciences, and physical sciences. Professional majors could represent change in the liberal arts, rather than abandonment of the liberal arts. At the very least, we propose that the adoption of professional and liberal arts majors, in some cases, are a defense of the liberal arts.

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Table 1. Correlation Matrix of Independent Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Black	1.00														
2. Asian	-0.04	1.00													
3. Hispanic	-0.04	-0.05	1.00												
4. Male	-0.03	-0.01	-0.03	1.00											
5. ACT Composite Score	-0.21	0.05	-0.15	0.03	1.00										
6. First Generation Status	0.08	0.04	0.15	-0.03	-0.30	1.00									
7. High School GPA	-0.09	-0.01	-0.05	-0.05	0.34	-0.06	1.00								
8. Precollege Educational Aspirations	0.05	0.05	0.03	0.06	0.16	-0.05	0.18	1.00							
9. Precollege Academic Motivation	0.06	0.03	0.05	-0.12	0.06	0.04	0.18	0.25	1.00						
10. Institutional Selectivity	-0.11	0.08	-0.04	0.01	0.62	-0.26	0.27	0.16	0.06	1.00					
11. Academic Honors Program	0.00	0.00	0.01	-0.11	-0.03	0.01	0.08	0.03	0.10	-0.18	1.00				
12. Co-Curricular Involvement	-0.02	-0.03	-0.06	0.15	-0.01	-0.06	0.03	0.03	-0.01	0.03	0.01	1.00			
13. Professional/Career Success Scale	0.10	0.07	0.04	0.14	-0.25	0.08	-0.13	0.07	0.07	-0.16	0.04	0.10	1.00		
14. Meaningful Interactions with Diverse Peers	0.09	0.10	0.13	0.01	-0.05	0.00	-0.04	0.09	0.12	0.07	-0.01	0.08	0.10	1.00	
15. Professional Major	-0.02	-0.04	-0.03	-0.06	-0.21	0.08	-0.05	-0.19	-0.06	-0.24	0.05	-0.02	0.04	-0.13	1.00

Table 2.

Descriptive Statistics on Precollege and College Experience Variables by Academic Major using the Wabash National Study of Liberal Arts Education

	Professional Major (n=304)						Traditional Liberal Arts Major (n=2,317)					
Variables	Mean	SD	Freq.	%	Min.	Max.	Mean	SD	Freq.	%	Min.	Max.
Senior-Year Level of Critical Thinking	63.78	4.16			53	72	65.53	5.36			47	73
Precollege Level of Critical Thinking	60.68	4.76			51	73	63.65	5.15			48	81.22
	3.10						1.88					
Senior-Year Level of Moral Reasoning	38.38	14.43			1.82	68.06	46.45	15.07			-2.02	81.01
Precollege Level of Moral Reasoning	30.24	13.33			0.27	63.47	38.64	15.37			-8.84	81.22
	8.14						7.81					
Senior-Year Level of Positive Attitude toward Literacy	3.08	0.8			1	5	3.54	0.73			1	5
Precollege Level of Positive Attitude toward Literacy	3.09	0.69			1	5	3.45	0.71			1	5
	-0.01						0.090					
Senior-Year Level of Need for Cognition	3.59	0.59			1.5	4.72	3.78	0.59			1.17	5
Precollege Level of Need for Cognition	3.29	0.55			1.67	4.67	3.59	0.58			1.44	5
	0.30						0.19					
Senior-Year Level of Openness to Diversity/Challenge	3.76	0.7			1	5	3.96	0.66			1	5
Precollege Level of Openness to Diversity/Challenge	3.76	0.61			1.29	5	4.01	0.6			1	5
	0.00						-0.05					
Senior-Year Level of MGUDS	4.6	0.65			2.53	5.93	4.75	0.64			1.33	6
Precollege Level of MGUDS	4.44	0.63			2.6	5.8	4.67	0.63			1.33	6
	0.16						0.08					
Senior-Year Level of Psychological Well-Being	4.75	0.55			3.22	5.93	4.69	0.6			1.37	6
Precollege Level of Psychological Well-Being	4.49	0.54			3.24	5.85	4.52	0.57			1.65	5.91
	0.26						0.17					
Senior-Year Level of Socially Responsible Leadership	4.17	0.42			1.57	4.99	4.12	0.47			1.05	5
Precollege Level of Socially Responsible Leadership	3.97	0.4			1.88	4.93	4	0.44			1.00	5
	0.20						0.12					
Covariates												
Black			8	2.63	0	1			83	3.58		
Asian			8	2.63	0	1			121	5.22		
Hispanic			9	2.96	0	1			115	4.96		
Male			101	33.22	0	1			997	43.03		
ACT Composite Score	24.58	3.88			15	33	27.34	4.14			8	36
High School GPA	4.61	0.51			3	5	4.69	0.49			1	5
First Generation Status			97	31.91	0	1			509	21.97	1	0
Precollege Educational Aspirations	3.91	0.88			2	6	4.59	1.14			1	5
Precollege Academic Motivation	3.56	0.52			2.38	5	3.66	0.54			1.25	5
Institutional Selectivity	25.27	2.04			21.13	30.93	27.25	2.59			21.12	31.76
Academic Honors Program			94	30.92	0	1			570	24.6	0	1
Co-Curricular Involvement	3.01	1.69			1	5	3.12	1.79			1	8
Professional/Career Success Scale	2.35	0.71			1	4	2.27	0.69			1	4
Meaningful Interactions with Diverse Peers	-0.27	0.82			-1.86	1.66	0.07	0.84			-1.86	1.74

Table 3. The Estimated Effects of Academic Major at Liberal Arts Colleges on Student Learning Outcomes Using Wabash National Study Data

	Critical Thinking	Moral Reasoning	Need for Cognition	Positive Attitude Towards Literacy	Openness to Diversity	M-GUDS	Psychological Wellbeing	Socially Responsible Leadership
	n=1202	n=1261	n=2574	n=2615	n=2617	n=2497	n=2511	n=2563
	Coef	Coef	Coef	Coef	Coef	Coef	Coef	Coef
Black	-0.1168	-0.0571	-0.0963	-0.1070	-0.0328	-0.0829	-0.1250	0.0139
Asian	0.0437	0.0428	-0.1645	-0.1705	0.0290	0.0973	-0.0730	0.0075
Hispanic	0.0473	-0.1509	0.0524	-0.1489*	0.0742	0.1136	0.0490	0.0871
Male	0.0228	-0.2433***	0.0889*	0.0322	-0.0900*	-0.1353**	-0.0873*	-0.1031**
ACT Composite Score	0.2113***	0.2136***	0.1159***	0.0964***	-0.0052	0.0149	-0.0109	0.0318
First Generation Status	0.1173**	-0.0683	0.0134	-0.0429	0.0358	-0.0147	-0.0009	0.0044
High School GPA	0.0361	0.0236	0.0212	-0.0086	0.0336*	0.0115	0.0171	0.0166
Precollege Educational Aspirations	0.0260	-0.0122	0.0110	0.0355*	-0.0127	-0.0052	0.0081	-0.0147
Precollege Academic Motivation	-0.0111	0.0066	-0.0104	-0.0474	-0.0388**	0.0141	-0.0102	0.0550*
PRETEST	0.5333***	0.4336***	0.5499***	0.5364***	0.3146***	0.4650***	0.4757***	0.2875***
Institutional Selectivity	-0.0220	-0.0006	-0.0205	-0.0061	-0.0126	-0.0101	-0.0158	-0.0127
Academic Honors Program	-0.0746	0.0637	0.0712	0.0250	0.0621*	0.0570	0.0635	0.0779
Co-Curricular Involvement	-0.0212	-0.0159	-0.0032	-0.0103	0.0106	-0.0163	0.0531*	0.0760**
Professional/Career Success Scale	-0.1108**	-0.0864***	0.0580**	-0.0153	0.0196	-0.0565**	0.0203	0.0229
Meaningful Interactions with Diverse Peers	0.0214	0.0691*	0.1372***	0.1736***	0.4320***	0.3011***	0.1028***	0.1431***
Professional Major	0.0434	-0.0936	0.0481	-0.2263***	-0.0415	0.0501	0.0841	0.1289**
	R^2 =0.5368	R^2 =0.4527	R^2 =0.3871	R^2 =0.3994	R^2 =0.3476	R^2 =0.4179	R^2 =0.2831	R^2 =0.1694

Note: *p<0.05, **p<0.01, ***p<0.001.