What is the impact of a first-year experience course and mentoring program on early postsecondary outcomes? Experimental evidence from the Broncos FIRST program

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Background/Context:

First-year experience (FYE) courses are designed to support the academic performance, persistence, and academic and social integration of new college students (Hunter and Linder 2005). They are now offered at the majority of four-year postsecondary institutions and are often mandatory for all first-year students or for certain student populations (Barefoot and Fidler, 1992). Despite the increasing prevalence of FYE courses at two- and four-year colleges and universities, a 2016 What Works Clearinghouse (WWC) review found only four impact studies on FYE courses that met WWC standards, all of which used quasi-experimental methods (U.S. Department of Education, 2016). Two studies provided evidence that FYE courses positively impact students' persistence through college (Clouse, 2012; Wilkerson, 2008), one study found positive impacts on degree attainment (Clouse, 2012), and one study found positive impacts of FYEs on GPA (Jamelske, 2009).

Purpose/Objective/Research Question:

The primary research question of this study is "What is the impact of the Broncos FIRST program (first-year experience course and mentoring) on students' academic success, as measured by GPA, credits earned, good academic standing, and persistence into the second year of college?"

Setting:

The study takes place at Western Michigan University (WMU), a public research university located in Kalamazoo, Michigan with a total enrollment of approximately 24,000 students.

Population/Participants/Subjects:

The study population consists of 317 Pell-eligible, first-year college students. The study sample is 69% female, 55% non-white, and has an average high school GPA of 3.27. The study sample is fairly similar to the population of Pell-eligible students at WMU, except it is more likely to be female and has a lower average college entrance exam score. The study sample is more likely to be female and non-white and has a lower average high school GPA and college entrance exam score than first-year WMU students as a whole.

The study population includes two cohorts of students, first-year students in the 2016-17 school year (Cohort 2) and the 2017-18 school year (Cohort 3). Students from 2015-16 (Cohort 1), a pilot year, were not included in this study.

Intervention/Program/Practice:

Students enrolled in the Broncos FIRST program participate in a specialized first-year experience course, University 1030, designed to address areas where low-income students need extra support, such as financial literacy, reading and writing strategies, and acclimation to the college culture. Students also receive mentoring from either a community mentor (CM) or a member of a professional learning community (PLC). Community mentors are local professionals recruited in collaboration with a local economic development organization. PLC mentors are WMU faculty/staff engaged in action research projects designed to help the university better serve the needs of low-

income students. The PLC mentoring is intended to be reciprocal mentoring, since students have the opportunity to provide feedback to faculty/staff, in addition to receiving mentoring from faculty/staff. The University 1030 course and the associated mentoring last the entire academic year and are worth 2 credit hours in the fall and 1 credit hour in the spring.

Research Design:

The study employs a random assignment design to estimate the impact of Broncos FIRST on student outcomes. A total of 317 students agreed to participate in the study and were randomly assigned across Cohorts 2 and 3. Random assignment resulted in 215 students in the treatment group (PLC or CM FYE sections), and 102 students in the control group.

Data Collection and Analysis:

All study data were obtained from Western Michigan University's administrative databases. Missing baseline data on HS GPA, standardized college entrance exam score, and non-white are imputed using the single mean imputation method (Puma et al., 2009).

The analytic samples only include students for whom outcome data are available; due to different levels of missing data for different outcomes, there are two analytic samples: analytic sample 1 is for GPA, good academic standing, credits earned, and analytic sample 2 is for first-year persistence. For analytic sample 1, the overall attrition rate was 15.1%, and differential attrition between the treatment and control groups was 6.4%. There was no attrition for analytic sample 2. For both analytic samples, there are no statistically significant differences between the treatment and control groups on baseline characteristics.

The primary analysis uses an intent-to-treat (ITT) framework, in which students are analyzed in the group to which they are randomly assigned, regardless of whether they actually received the treatment or the extent of their exposure to the treatment. We use the following multivariate linear model to estimate the program impacts:

$$Y = \beta_0 + \beta_1 T + \beta_2 T C_3 + \beta_3 C_3 + \sum_{j=1}^{20} \beta_{4+j} B_j + \sum_{k=1}^{4} \beta_{24+k} X_k + \sum_{l=1}^{20} \beta_{28+l} B_l C_3$$

$$+ \sum_{m=1}^{4} \beta_{48+m} X_m C_3 + \varepsilon$$

where Y is the outcome, T is the treatment indicator (=1 if randomized to the PLC or CM group, =0 if randomized to the control group), B_k is the indicator for the kth randomization block, C_3 is an indicator for cohort 3, X_j is the jth student standardized covariate including high school GPA, female gender, nonwhite race or Hispanic ethnicity, and college entrance exam score, and ε is the idiosyncratic error term. Robust standard errors were estimated. A correction for multiple hypothesis testing is made for similar outcomes (GPA and good academic standing; credits earned and first-year persistence) using the Benjamini-Hochberg procedure (Benjamini & Hochberg, 1995). In this model, β_1 represents the impact of the Broncos FIRST intervention for

cohort 3 (C_3=1) and β_2 the differential impact for cohort 3; the overall treatment effect is computed as the average marginal effect of the treatment overall, adjusting for covariates.

Findings/Results:

Exhibit 5 shows that the impacts for GPA, good academic standing, and credits earned are positive but are not statistically significant. The estimate for first-year persistence is negative, but not statistically significant. Finally, there is no statistically significant difference in impacts between Cohorts 2 and 3.

Exhibit 5. Intent-to-treat (ITT) estimates, adjusting for covariates.

Outcome	Control Group Mean (SD) [N]	Treatment Group Model-adjusted Mean (SD) [N]	Treatment – Control Difference	Standardized Difference	p-value	Differential Impact in Cohort 3	p-value
GPA	2.84 (0.87) [91]	2.93 (0.79) [178]	0.10	0.12	0.30	-0.07	0.71
Good Standing	0.73 (0.45) [91]	0.82 (0.40) [178]	0.09	0.22	0.08	-0.12	0.25
Credits Earned	24.99 (6.65) [91]	26.42 (7.22) [178]	1.43	0.20	0.05	-0.04	0.98
First-Year Persistence	0.75 (0.44) [102]	0.72 (0.46) [215]	-0.02	-0.05	0.67	0.07	0.51

Benjamini-Hochberg-adjusted significance levels

* $p < 0.025$, ** $p < 0.005$, *** $p < 0.0005$

Standard significance levels

† $p < 0.05$, †† $p < 0.01$, ††† $p < 0.001$

Standardized Difference = Estimated treatment-control difference divided by the pooled treatment and control group SD

Model adjusted treatment group mean = control group mean + estimated treatment – control difference

Conclusions:

As the first random assignment study of an FYE course, this study makes an important contribution to the literature. While previous quasi-experimental studies indicate positive outcomes of FYE courses, this study finds null results, casting doubt on the validity of previous findings from less

rigorous study designs. A limitation of this paper is the low sample size and thus limited power to detect small program impacts.

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