

ESTIMATING THE RELATIONSHIP BETWEEN BROADBAND CONNECTIVITY AND PARTICIPATION RATES IN COLLEGE eLEARNING

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ABSTRACT

Online learning, or eLearning, has been touted as a way to educate postsecondary students in a flexible and cost-effective manner. Public institutions in many states, especially those at the two-year level, have steadily increased the number of eLearning credit hours they offer in the past few years. Research on the efficacy of eLearning is limited, however, due to its relatively recent emergence. One concern about the growth of eLearning is that the digital divide between those who have access to higher quality broadband and those who do not may lead to poorer outcomes for those in the latter group who attempt eLearning coursework. This project represents a first step toward an answer to this concern by using census tract-level broadband data gathered from the National Broadband Map, census population data, and institutional-level data taken from IPEDS and the Southern Regional Education Board (SREB) to estimate the association between broadband connectivity and eLearning participation rates at a number of postsecondary institutions in the southern United States.

Using the full sample of institutions ($N = 527$), OLS regression shows that the relative percentage of eLearning credits increases by 1.841% ($p < .10$) for every categorical increase in broadband download speed. Running the same model using a reduced sample that includes only two-year institutions ($N = 329$), the relative percentage of attempted eLearning credits is shown to increase by 1.479% ($p < .01$). Compared to the respective effects of an open admission policy, town and rural locations, and the percentages of part-time students and students aged 25 years and older, the effect of broadband connectivity is comparatively small in both models. The positive direction and statistically significant finding, however, suggest that (1) students respond to broadband connection in their area when attempting eLearning credit hours and/or (2) postsecondary institutions respond to broadband connectivity when offering courses with eLearning components.

DESCRIPTIVE STATISTICS

TABLE 1: DESCRIPTIVE STATISTICS FOR FULL SAMPLE ($N = 527$)

	Mean	SD	Min	Max
% eLearning courses	20.26	14.39	0.00	94.21
% Part-time students	43.91	21.39	0.00	82.70
% Students age 25 or over	33.78	13.80	2.06	82.37
Two-year	0.62	0.48	0.00	1.00
Open admissions	0.67	0.47	0.00	1.00
On-campus housing available	0.47	0.50	0.00	1.00
Urban	0.35	0.48	0.00	1.00
Suburban	0.12	0.33	0.00	1.00
Town	0.24	0.42	0.00	1.00
Rural	0.29	0.45	0.00	1.00
Counties within 20 miles	11.42	3.28	4.00	22.00
States				15
Counties				527
Institutions				527

RESULTS

TABLE 2: eLEARNING PERCENTAGE REGRESSED ON BROADBAND SPEED AND COVARIATES: FULL SAMPLE ($N = 527$)

	Naive	(+) Locale	(+) School
Average wired download speed (Mbps)	1.775 ⁺ (1.13)	1.838* (1.11)	1.841* (0.96)
Suburban		1.302 (1.90)	-1.307 (1.51)
Town		4.084** (1.64)	5.278*** (1.39)
Rural		8.654*** (1.52)	6.701*** (1.49)
Open admissions			5.204** (2.18)
On-campus housing provided			2.943 ⁺ (1.81)
Two-year institution			-6.442*** (2.28)
% of part-time students (tens)			2.531*** (0.54)
% of students age 25 or over (tens)			3.025*** (0.78)
Constant	20.274*** (0.63)	16.674*** (0.90)	16.429*** (1.65)
R^2	0.005	0.066	0.352

Robust standard errors in parentheses

⁺ $p < .15$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ TABLE 3: eLEARNING PERCENTAGE REGRESSED ON BROADBAND AND COVARIATES: TWO-YEAR COLLEGES ($N = 329$)

	Naive	(+) Locale	(+) School
Average wired download speed (Mbps)	1.786*** (0.37)	1.643*** (0.36)	1.479*** (0.35)
Suburban		-1.206 (2.10)	-2.004 (2.05)
Town		2.465 (1.91)	5.560** (2.17)
Rural		5.515*** (1.76)	7.473*** (1.94)
% of part-time students (tens)			2.123*** (0.57)
% of students age 25 or over (tens)			1.238 ⁺ (0.83)
Constant	29.612*** (1.18)	26.529*** (1.56)	24.224*** (1.77)
R^2	0.069	0.106	0.156

Robust standard errors in parentheses

⁺ $p < .15$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$