

# Supplementary Information for

## Impact of a first-year place-based learning community on STEM students' academic achievement in their second, third, and fourth years

**Table 1** Full descriptive statistics of all response variables for the first three cohorts of the Klamath Connection place-based learning community (LC) compared to a reference group (REF) disaggregated by underrepresented groups (URG), first-generation, and low-income students.

Response variable	Group	All students			URG			Non-URG			First generation			Low Income		
		mean	SE	n	mean	SE	n	mean	SE	n	mean	SE	n	mean	SE	n
Units earned after 1 year	LC	40.2	0.996	254	39.6	1.708	99	40.5	1.218	155	40.2	1.548	112	40.3	1.700	91
	REF	36.8	0.770	470	32.1	1.123	186	39.9	1.001	284	33.2	0.992	213	33.9	1.050	201
Units earned after 2 years	LC	70.6	1.300	213	70.2	2.252	81	70.9	1.585	132	71.9	2.110	90	68.8	2.243	68
	REF	66.9	0.979	359	62.6	1.312	136	69.5	1.330	223	64.4	1.250	156	64.3	1.336	150
Units earned after 3 years	LC	99.5	1.475	197	97.3	1.664	120	100.8	1.706	124	99.8	2.332	81	98.3	2.663	63
	REF	95.6	1.158	317	89.0	1.664	73	99.6	1.496	197	90.9	1.628	134	93.0	1.600	132
Units earned after 4 years	LC	125.3	1.664	173	121.6	2.966	65	127.6	1.958	108	126.0	2.516	72	122.9	3.214	48
	REF	121.2	1.255	305	114.9	1.918	116	125.1	1.587	189	117.4	1.862	130	119.4	1.961	123
GPA after 1 year	LC	2.912	0.046	254	2.854	0.068	99	2.95	0.062	155	2.94	0.074	112	2.882	0.085	91
	REF	2.801	0.039	470	2.617	0.065	186	2.922	0.048	284	2.658	0.061	213	2.679	0.060	201
GPA after 2 years	LC	3.067	0.038	213	2.981	0.057	81	3.119	0.050	132	3.116	0.059	90	3.01	0.061	68
	REF	3.024	0.029	359	2.912	0.043	136	3.092	0.037	223	2.955	0.039	156	2.926	0.043	150
GPA after 3 years	LC	3.082	0.038	197	2.975	0.059	73	3.145	0.048	124	3.109	0.057	81	3.042	0.060	63
	REF	3.082	0.028	317	2.925	0.046	120	3.178	0.034	197	2.946	0.044	134	3.008	0.045	132
GPA after 4 years	LC	3.134	0.036	173	3.015	0.058	65	3.206	0.046	108	3.122	0.060	72	3.043	0.073	48
	REF	3.118	0.036	173	3.002	0.044	116	3.189	0.035	189	3.009	0.043	130	3.05	0.044	123
Success rate in intro biology	LC	90.5%	143	158	86.2%	56	65	93.5%	87	93	95.6%	65	68	87.5%	49	56
	REF	89.5%	179	200	90.0%	63	70	89.2%	116	130	88.2%	75	85	92.7%	76	82
Success rate in calculus	LC	80.4%	78	97	72.0%	36	50	89.4%	42	47	74.5%	41	55	77.1%	27	35
	REF	74.2%	98	132	72.7%	40	55	75.3%	58	77	76.7%	46	60	74.6%	44	59
Success rate in physics	LC	93.8%	76	81	97.2%	35	36	91.1%	41	45	93.0%	40	43	93.5%	29	31
	REF	95.7%	110	115	92.7%	38	41	97.3%	72	74	94.2%	49	52	95.3%	41	43
Success rate in statistics	LC	82.7%	115	139	78.9%	45	57	85.4%	70	82	86.4%	51	59	78.4%	40	51
	REF	80.4%	127	158	76.9%	50	65	82.8%	77	93	76.8%	53	69	79.7%	51	64
	LC	78.3%	65	83	73.7%	28	38	82.2%	37	45	76.2%	32	42	68.6%	24	35

Success rate in genetics	REF	81.9%	86	105	68.3%	28	41	90.6%	58	64	68.5%	37	54	72.1%	31	43
Success rate in plant taxonomy	LC	88.1%	52	59	88.9%	16	18	87.8%	36	41	90.0%	27	30	85.0%	17	20
	REF	88.1%	59	67	90.9%	20	22	86.7%	39	45	83.3%	20	24	84.0%	21	25
Success rate in mammalogy	LC	75.9%	41	54	61.9%	13	21	84.8%	28	33	71.4%	20	28	59.1%	13	22
	REF	76.5%	39	51	66.7%	14	21	83.3%	25	30	68.2%	15	22	84.2%	16	19
Success rate in organic chemistry	LC	97.8%	44	45	100.0%	17	17	96.4%	27	28	100.0%	21	21	100.0%	16	16
	REF	93.3%	56	60	90.0%	18	20	95.0%	38	40	86.2%	25	29	84.6%	22	26
Institutional retention after 1 year <sup>A</sup>	LC	81.5%	220	270	81.0%	85	105	81.8%	135	165	76.7%	92	120	74.5%	73	98
	REF	72.6%	369	508	70.1%	141	201	74.3%	228	307	69.4%	161	232	71.0%	157	221
Institutional retention after 2 years	LC	75.9%	205	270	70.5%	74	105	79.4%	131	165	67.5%	81	120	66.3%	65	98
	REF	63.6%	323	508	60.2%	121	201	65.8%	202	307	58.2%	135	232	59.7%	132	221
Institutional retention after 3 years	LC	69.6%	188	270	63.8%	67	105	73.3%	121	165	65.0%	78	120	63.3%	62	98
	REF	62.2%	316	508	58.2%	117	201	64.8%	199	307	56.9%	132	232	57.5%	127	221
STEM retention after 1 year <sup>A</sup>	LC	76.7%	207	270	76.2%	80	105	77.0%	127	165	72.5%	87	120	67.3%	66	98
	REF	64.0%	325	508	59.7%	120	201	66.8%	205	307	59.1%	137	232	58.8%	130	221
STEM retention after 2 years	LC	67.4%	182	270	64.8%	68	105	69.1%	114	165	63.3%	76	120	60.2%	59	98
	REF	53.0%	269	508	48.3%	97	201	56.0%	172	307	47.0%	109	232	48.0%	106	221
STEM retention after 3 years	LC	60.7%	164	270	57.1%	60	105	63.0%	104	165	60.0%	72	120	48.0%	47	98
	REF	48.4%	246	508	41.3%	83	201	53.1%	163	307	40.5%	94	232	38.5%	85	221
Institutional 4-year graduation	LC	30.7%	83	270	24.8%	26	105	34.5%	57	165	28.3%	34	120	25.5%	25	98
	REF	22.4%	114	508	15.4%	31	201	27.0%	83	307	16.4%	38	232	19.5%	43	221
STEM 4-year graduation	LC	27.0%	73	270	21.9%	23	105	30.3%	50	165	26.7%	32	120	24.5%	24	98
	REF	15.9%	81	508	10.0%	20	201	19.9%	61	307	10.3%	24	232	12.2%	27	221
Institutional “continuation” <sup>A</sup>	LC	21.9%	59	270	27.6%	29	105	18.2%	30	165	22.5%	27	120	23.5%	23	98
	REF	15.9%	81	508	16.9%	34	201	15.3%	47	307	15.1%	35	232	14.0%	31	221
STEM “continuation” <sup>A</sup>	LC	18.1%	49	270	21.0%	22	105	16.4%	27	165	18.3%	22	120	18.4%	18	98
	REF	13.6%	69	508	13.4%	27	201	13.7%	42	307	12.1%	28	232	10.9%	24	221

<sup>A</sup> Continuation described the percentage of students that had not graduated in 4 years but were still enrolled into their fifth year (institutional or STEM-specific enrollment).

**Table 2** Analytical statistics of all response variables for the first three cohorts of the Klamath Connection place-based learning community compared to a reference group disaggregated by underrepresented groups (URG), first-generation (FG), and low-income (LI) students. Hedges’s *g* effect sizes and ANOVA statistics of the main effect of learning community participation (*F*, *df*, and *P*) are shown for continuous response variables (the first eight), and Cox’s *d* effect sizes and logistic regression statistics of the main effect of learning community participation (*z*, *P*) are shown for the remaining 18 binary variables. Bolded values indicate a small or medium (if also italicized) effect size, and a significant (*P* < 0.05) main effect of learning community participation.

Response variable	Hedge’s <i>g</i> or Cox’s <i>d</i> effect sizes					Test statistics and <i>P</i>		
	All	URG	Non-URG	FG	LI	<i>F</i> or <i>z</i>	<i>df</i>	<i>P</i>
Units earned after 1 year	<b>0.207</b>	<b>0.470</b>	0.037	<b>0.461</b>	<b>0.42</b>	<b>6.832</b>	<b>1,718</b>	<b>0.009</b>
Units earned after 2 years	0.198	<b>0.437</b>	0.073	<b>0.431</b>	<b>0.26</b>	4.652	1,566	<b>0.031</b>
Units earned after 3 years	0.189	<b>0.491</b>	0.059	<b>0.451</b>	<b>0.27</b>	4.357	1,507	<b>0.037</b>
Units earned after 4 years	0.187	<b>0.305</b>	0.117	<b>0.403</b>	0.16	3.849	1,472	<b>0.050</b>
GPA after 1 year	0.137	<b>0.288</b>	0.035	<b>0.329</b>	<b>0.24</b>	2.761	1,717	<b>0.097</b>
GPA after 2 years	0.078	0.136	0.048	<b>0.312</b>	0.16	0.486	1,565	0.493
GPA after 3 years	0.000	0.099	-0.066	<b>0.318</b>	0.07	0.004	1,507	0.949
GPA after 4 years	0.034	0.027	0.035	0.226	-0.01	0.055	1,471	0.815
Success rate in intro biology	0.068	<b>-0.222</b>	<b>0.338</b>	<i>0.640</i>	<b>-0.357</b>	0.809		0.130
Success rate in calculus	<b>0.214</b>	-0.022	<i>0.610</i>	-0.069	0.084	0.942		0.346
Success rate in physics	<b>-0.223</b>	<i>0.610</i>	<b>-0.756</b>	-0.122	<b>-0.208</b>	-1.789		0.074
Success rate in statistics	0.095	0.071	0.116	<b>0.394</b>	-0.046	0.172		0.863
Success rate in genetics	-0.136	0.157	<b>-0.444</b>	<b>0.232</b>	-0.101	-1.764		0.078
Success rate in plant taxonomy	0.004	-0.133	0.061	<b>0.351</b>	0.045	0.024		0.981
Success rate in mammalogy	-0.018	-0.123	0.068	0.092	<b>-0.776</b>	0.208		0.835
Success rate in organic chemistry	<i>0.689</i>	na	0.211	na	na	0.205		0.837
Institutional retention after 1 year <sup>A</sup>	<b>0.306</b>	<b>0.358</b>	<b>0.269</b>	<b>0.224</b>	0.105	1.869		0.062
Institutional retention after 2 years	<b>0.358</b>	<b>0.276</b>	<b>0.420</b>	<b>0.242</b>	0.172	<b>3.100</b>		<b>0.002</b>
Institutional retention after 3 years	<b>0.201</b>	0.143	<b>0.242</b>	<b>0.206</b>	0.147	1.888		0.059
STEM retention after 1 year <sup>A</sup>	<b>0.373</b>	<b>0.466</b>	<b>0.308</b>	<b>0.365</b>	0.222	<b>2.433</b>		<b>0.015</b>
STEM retention after 2 years	<b>0.368</b>	<b>0.410</b>	<b>0.340</b>	<b>0.404</b>	<b>0.300</b>	<b>3.330</b>		<b>0.001</b>
STEM retention after 3 years	<b>0.302</b>	<b>0.387</b>	<b>0.248</b>	<b>0.477</b>	<b>0.235</b>	<b>2.703</b>		<b>0.007</b>
Institutional 4-year graduation	<b>0.259</b>	<b>0.357</b>	<b>0.214</b>	<b>0.425</b>	<b>0.211</b>	1.724		0.085
STEM 4-year graduation	<b>0.405</b>	<b>0.563</b>	<b>0.340</b>	<b>0.694</b>	<b>0.512</b>	2.684		<b>0.007</b>
Institutional “continuation” <sup>B</sup>	0.235	<b>0.380</b>	0.125	<b>0.297</b>	<b>0.382</b>	2.648		<b>0.008</b>
STEM “continuation” <sup>B</sup>	0.208	<b>0.324</b>	0.127	<b>0.298</b>	<b>0.371</b>	3.167		<b>0.002</b>

<sup>A</sup> Continuation described the percentage of students that had not graduated in 4 years but were still enrolled into their fifth year (institutional or STEM-specific enrollment).