

TABLE 1**Demographics of students enrolled in an undergraduate cell biology course.**

Characteristics	Total (n)	Percentage
Total number of students	252	
Students who responded to survey	224	88.9
Gender		
Male	89	39.7
Female	135	60.3
Major		
Biological sciences	143*	63.8
Public health sciences	26	11.6
Human biology	16	7.1
Pharmaceutical sciences	9	4
Other	32*	14.3
Ethnicity		
White	36	16.1
Asian	143	63.8
Hispanic/Latino	41	18.3
African American	4	1.8
Average college GPA (\pm SD)	3.18 \pm 0.47	

Note. SD = standard deviation.

TABLE 2**Lecture structure for the undergraduate cell biology course.**

Time frame	Lecture component
Before class	Reading guide (optional) Preclass quiz (graded)
During class	iClicker questions Lecture
After class	Studying (optional) Weekly review quiz (graded)

TABLE 3**Multiple linear regression analysis of the effects of the use of the on-line learning component on online preclass quiz performance.**

Regression coefficient	Estimate ± SE	p value
Model intercept	60.13 ± 4.71	<2e-16***
Online learning component (yes)	7.16 ± 1.25	3.18e-08***
GPA	8.49 ± 1.33	1.16e-09***
Gender (male)	-0.12 ± 1.24	0.92
Ethnicity (African American)	-2.34 ± 4.78	0.62
Ethnicity (Hispanic)	1.77 ± 2.11	0.40
Ethnicity (Asian)	3.03 ± 1.70	0.08
Major (public health)	-7.78 ± 1.90	5.93e-05***
Major (other)	-3.45 ± 2.18	0.11

Note. The reference levels for this model are as follows: (1) did not use the online learning component, (2) female, (3) biological sciences major, and (4) Caucasian. This model included 224 students. SE = standard error.

*** $p < 0.001$

TABLE 4**Multiple linear regression analysis of the effects of the use of the on-line learning component on examination performance.**

Regression coefficient	Estimate ± SE	p value
Model intercept	-3.40 ± 4.72	0.47
Online learning component (yes)	-1.17 ± 1.25	0.35
GPA	21.18 ± 1.34	<2e-16***
Gender (male)	0.98 ± 1.24	0.43
Ethnicity (African American)	0.34 ± 4.79	0.94
Ethnicity (Hispanic)	0.36 ± 2.11	0.87
Ethnicity (Asian)	0.67 ± 1.70	0.69
Major (public health)	-7.07 ± 1.90	2.57e-04***
Major (other)	-0.43 ± 2.18	0.84

Note. The reference levels for this model are as follows: (1) did not use the online learning component, (2) female, (3) biological sciences major, and (4) Caucasian. This model included 224 students. SE = standard error.

*** $p < 0.001$