Student Interest is the Strongest Determinant of Success in Introductory College Courses Related to Environmental Science

Nick Balster, Melanie Spero, Mark Banghart

University of Wisconsin – Madison

Less than *40%* students entering college intend to study in STEM fields. *(pcast 2013)*

American workforce to face a deficit of *1 Million* college graduated in STEM over next decade. *(pcast 2012)*

More than *50%* population lives in urban centers with little direct access to nature. *(WU 2008)*

Students that perform poorly in *introductory courses* tend to leave STEM majors. *(Chen 2013)*

Most STEM students come from *urban backgrounds*
– studies show they underperform rural students. *(Mousel et al. 2006)*

How has/is the problem being addressed?
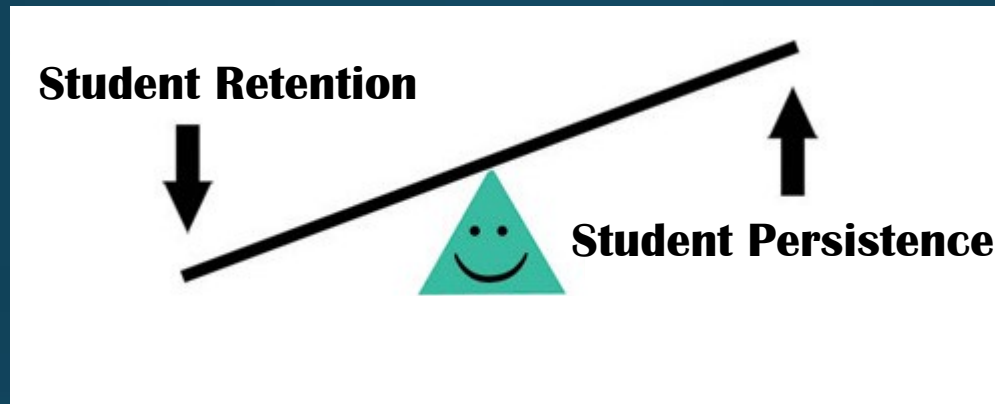
Improve student experience

What aspects of student background are the strongest determinants of success in introductory environmental science college courses?
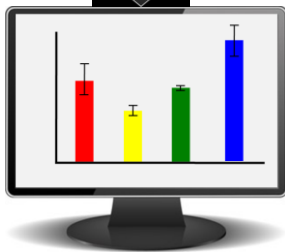
- Interest in the environment
- Previous environmental science education
- Childhood exposure to nature
- Childhood residence setting

- 23-question survey: 4-5 questions each aspect

- 13 intro environmental science college courses in 2013

- Collected 783 surveys;48% response rate

- Assessed to the student's final grade

- Academic success: *A final course grade that is ≥ median grade of the surveyed population within course*

- Logistic regression modeling used to determine coefficient values from survey results; likelihood ratio tests to determine best fit and significant predictors of academic success.

- Best fit model normalized relative to baseline case: Freshman growing up in an urban environment not interested in natural environment.

grade level   interest   residence setting

	Survey Response	Low (95%)	Coefficient Value	High (95%)
Intercept		0.07	**0.20**	0.54
Grade level	Freshman		**1.00**	
	Sophomore	0.89	**1.40**	2.22
	Junior	1.06	**1.74**	2.86
	Senior	1.09	**1.85**	3.15
Interest (in the natural environment)	Not interested		**1.00**	
	Indifferent	1.41	**3.71**	11.05
	Interested	1.86	**4.69**	13.47
	Very Interested	2.68	**6.86**	19.92
Residence Setting	Urban		**1.00**	
	Suburban	0.82	**1.24**	1.90
	Rural	1.11	**1.76**	2.78

Example: *Sophomore (1.40), Not interested (1.00), Suburban Residence (1.24)*

Example: A Freshman's Probability of Academic Success

Interest in the natural environment??

	Not Interested	Indifferent	Interested	Very Interested
Urban	**17%**	**43%***	**48%***	**58%***
Suburban	**20%**	**48%***	**54%***	**63%***
Rural	**26%***	**57%***	**62%***	**71%***

Spend the majority of your childhood??

* indicates that a student's probability of academic success is significantly different from the baseline student (not interested, urban), $p<0.05$

Conclusions & Implications:

Greater likelihood of academic success in introductory environmental science based coursework if…

In order of significance

> ➢ Interest in natural environment (7-fold increase)

> ➢ Higher class rank *(Bonello 1984; Watts et al. 1989)*

> ➢ Rural Childhood *(Greene 2004; Mousel et al. 2006)*

Previous environmental science education and childhood exposure to the environment did not alter a student's odds of academic success.

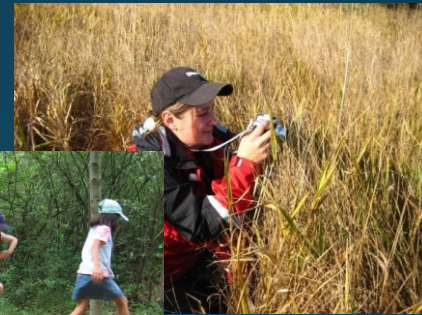# What can we do?

"Indifferent"
43-57% increase

Informal Interaction w/ Envir.

Introductory Courses KEY!

9 Introductory Courses
to Take This Fall

edX

Thanks for attention!

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