

Supplemental Material

CBE—Life Sciences Education

Cotner *et al.*

Appendix 1. Survey items, sources, and results of Standard Least-Squares multiple regression.

Significant predictors are noted by shading and asterisks; *p<0.05; **p<0.01; ***p<0.001.

Are there differences in how students see themselves? (Likert-scale responses ranging from 1=not at all like me to 5=very much like me)	majors vs non	Gender	Ethnicity	ACT
A Science Person ^a	***	***		***
A Creative Person ^a				
An Artistic Person ^a	***	***		
An Athletic Person ^a		***	***	
A People Person ^a				
A Spiritual Person ^a			**	***

Are there confidence differences? (Likert-scale responses ranging from 1=not confident to 4=very confident)	majors vs non	Gender	Ethnicity	ACT
Understand and evaluate scientific literature (i.e. papers written by scientists published in scientific journals). ^b	***	***		***
Analyze a set of observations, tables, or graphs to identify possible patterns. ^b	***	***		***
Pose questions about observations that can be answered with an experiment. ^b	**	***		***
Develop a hypothesis related to a question that has been posed. ^b	**			***
Design a well-controlled experiment to test a hypothesis. ^b		***		***
Make predictions about the results I could expect to get from an experiment. ^b		***	*	**
Collect, organize and display the results of an experiment. ^b	**			***
Use statistics or other appropriate methods to analyze the results of an experiment. ^b	***	***		***
Draw conclusions about a hypothesis based the results of the experiment. (taking into account possible sources of error in the experiment). ^b	***	**		***
Explain an experiment, the results, and analysis orally. ^b	**	**		***
Explain an experiment, the results, and analysis in writing. ^b	***			***

Are there confidence differences? (Likert-scale responses ranging from 1=strongly disagree to 5=strongly agree)	majors vs non	Gender	Ethnicity	ACT
Even if I forget the facts, I'll still be able to use scientific thinking to solve problems. ^c	***	**		***
I can do well in science courses. ^c	***	***	**	***
I can understand and evaluate the science related to a current issue, such as climate change. ^c	***	***		***
I can use my understanding of science to judge the quality of scientific studies. ^d	***	*		***
I could never be a successful scientist. ^a	***	***	*	***

Differences in perceptions of science and scientists? (Likert-scale responses ranging from 1=strongly disagree to 5=strongly agree)	majors vs non	Gender	Ethnicity	ACT
You can rely on scientific results to be true and correct. ^c		**		
When scientific results conflict with my personal experience, I follow my personal experience in making choices. ^c	**			***
A science course is a valuable part of a complete undergraduate education, regardless of major. ^c	***			***
I wish science instructors would just tell us what we need to know so we can learn it. ^c	*			***
Creativity does not play a role in science. ^c	**			***
Science is not connected to non-science fields such as history, literature, economics, or art. ^c		***		***
When experts disagree on a science question, it's because they don't know all the facts yet. ^c	*	*		
I get personal satisfaction when I solve a scientific problem by figuring it out myself. ^c	***			***
Since nothing in science is known for certain, all scientific conclusions are equally valid. ^c	***		***	***
Science is mostly an accumulation of facts, rules, and formulas. ^c	***			***
Scientists don't follow the scientific method in a straight line. ^c	***			***
There is too much emphasis in science courses on figuring things out for yourself. ^c			*	***

Scientists know what the results of their experiments will be before they start. ^c	*	*		*
Explaining science ideas to others has helped me understand the ideas better. ^c	***			***
The main job of instructors in science courses is to structure the work so that we can learn it ourselves. ^d		**		
Scientists play with statistics to support their own ideas. ^d		**		***
Course labs are used to confirm information studied in that science course. ^d	***			
If an experiment shows that something doesn't work, the experiment was a failure. ^d	***			***
When making an important personal decision, I use scientific processes, such as evaluating the available evidence. ^d				***
Science is a process of gathering and interpreting evidence (for example, making observations to explain the natural world). ^d	***			***
Science can be used in a person's daily life. ^d	***			***
I use science in my daily life. ^d				***
I think that science often has more negative impacts on society than positive impacts. ^d	**			***
I think that science is extremely valuable for society. ^d	***			***
Solving scientific problems is interesting. ^a	***			***
Scientific topics do not interest me. ^a	***			***
I am interested in the way science can be used to help people. ^a	***	*		**
I am interested in the way science can be used to solve problems. ^a	***			***
I am not interested in using science to help others. ^a	***	*		***
	majors vs non	Gender	Ethnicity	ACT

Sources: a. Cole, S. (2012). Loyola eCommons The Development of Science Identity : An Evaluation of Youth Development Programs at the Museum of Science and Industry , Chicago; b. Seymour, E., Hunter, A. B., Laursen, S. L., & Deantoni, T. (2004). Establishing the benefits of research experiences for undergraduates in the sciences: First findings from a three-year study. *Science Education*, 88(4), 493–534. <http://doi.org/10.1002/sce.10131>; c. Lopatto, D. (2004). Survey of Undergraduate Research Experiences (SURE): first findings. *Cell Biology Education*, 3(4), 270–277. <http://doi.org/10.1187/cbe.04-07-0045>; d. generated in-house.