

Data Dispositions Preliminary Results Fall 2019

A survey tool designed to measure participants' dispositions towards data was created and implemented at the start and finish of each module. The items on the survey fall into three categories: Fascination, Competencies, and Values. On all items, there are 21 matched pairs of data, with the exception of a few with only 20, which are noted.

Fascination

Fascination, in this context, could be described as a combination of curiosity, engagement, interest, and persistence. Results from the Fascination items show that most participants find data interesting, like doing projects with data, like making sense of graphs, and are curious about the data behind things that they see in the news. For the majority of these items, the statements were true both before and after Data Clubs. In particular items, however, there were changes from pre to post worth mentioning:

- On the statement: "After an activity where I work with data, I keep thinking about it", the percentage of those agreeing (yes or YES!) rose from 53% to 77%.
- For the item: "When I see a headline about a scientific finding, I am curious about the data it is based on", the percentage of those agreeing rose from 71% to 86%.

A. I FIND DATA TO BE:

n=21	Very interesting (1)	Interesting (2)	Boring (3)	Very Boring (4)
Pre	10%	86%	5%	0%
Post	24%	62%	10%	5%

B. IN GENERAL, WHEN I'M DOING A PROJECT THAT INVOLVES DATA, I:

n=21	Love it (1)	Like it (2)	Don't like it (3)	Hate it (4)
Pre	5%	91%	5%	0%
Post	14%	71%	14%	0%

C. AFTER AN ACTIVITY WHERE I WORK WITH DATA, I KEEP THINKING ABOUT IT

n=21	NO! (1)	no (2)	yes (3)	YES! (4)
Pre	0%	48%	48%	5%
Post	5%	19%	67%	10%

D. I LIKE MAKING SENSE OF GRAPHS

n=21	NO! (1)	no (2)	yes (3)	YES! (4)
Pre	5%	5%	67%	24%
Post	0%	10%	67%	24%

E. I'D RATHER HAVE SOMEONE GIVE ME THE CONCLUSION THAN SPEND TIME MAKING SENSE OF A SET OF DATA OR GRAPH MYSELF

n=21	NO!	no	yes	YES!
Pre	14%	57%	24%	5%
Post	14%	52%	33%	0%

F. WHEN I SEE A HEADLINE ABOUT A SCIENTIFIC FINDING, I AM CURIOUS ABOUT THE DATA IT IS BASED ON

n=21	NO!	no	yes	YES!
Pre	5%	24%	47%	24%
Post	0%	14%	67%	19%

Competencies

In this context, Competencies refer to comfort, confidence and knowledge of a variety of skills and approaches to data science. Similar to results on the Fascination items, participants in Data Clubs entered the program with a large degree of competence in their own ability to work with large datasets, interpret graphs, explore problems without one answer, learn new technology, and coming up with questions to explore the data.

Surprisingly, two items, on comfort of working with a large amount of data, and comfort exploring problems without a definite answer, had a smaller percentage of participants agreeing on the post survey than the pre. It is possible that these students came in confident that they

would be comfortable with these tasks, however had never actually been exposed to them, and thus realized they are more challenging than first assumed.

A higher percentage of participants agreed that they can understand visual data displays (81% pre to 90% post) after Data Clubs. Additionally, more participants enthusiastically agreed (YES!) that they are comfortable coming up with questions to use to explore data (5% to 19%).

G. I AM COMFORTABLE WORKING WITH A LARGE AMOUNT OF DATA TO TRY TO UNDERSTAND IT

n=20	NO! (1)	no (2)	Yes (3)	YES! (4)
Pre	0%	15%	55%	30%
Post	5%	19%	57%	19%

H. I CAN UNDERSTAND MOST VISUAL DISPLAYS OF DATA (CHARTS & GRAPHS) THAT ARE INTENDED FOR KIDS MY AGE

n=21	NO!	no	yes	YES!
Pre	0%	19%	52%	29%
Post	0%	10%	57%	33%

I. I AM COMFORTABLE EXPLORING COMPLEX PROBLEMS THAT MAY NOT HAVE A DEFINITE ANSWER

n=21	NO!	no	yes	YES!
Pre	0%	14%	62%	24%
Post	5%	29%	52%	14%

M. I AM CONFIDENT THAT I CAN USE OR LEARN TO USE TECHNOLOGY TO CREATE VISUAL DISPLAYS FOR DATA

n=21	NO!	no	yes	YES!
Pre	0%	19%	48%	33%
Post	5%	10%	48%	38%

N. I PREFER TO HAVE STEP BY STEP INSTRUCTIONS WHEN WORKING WITH DATA, RATHER THAN BEING ABLE TO EXPLORE ON MY OWN

n=21	NO!	no	yes	YES!
Pre	0%	57%	33%	10%
Post	15%	50%	30%	5%

O. I AM COMFORTABLE COMING UP WITH MY OWN QUESTIONS WHEN EXPLORING DATA

n=21	NO!	no	yes	YES!
Pre	0%	19%	76%	5%
Post	0%	19%	62%	19%

P. WHEN I CAN'T FIND PATTERNS IN DATA, IT MAKES ME WANT TO KEEP LOOKING AND DIG DEEPER

n=21	NO!	no	yes	YES!
Pre	5%	24%	62%	10%
Post	5%	24%	62%	10%

Values

The items in the Values section assess participants' understanding of how data is relevant and used in the real world, in their communities, and in science.

Results were mixed in this area. A higher percentage of participants agreed that they understand how data is related to community issues after their participation in Data clubs (86%), than prior to (71%). The percentage enthusiastically agreeing (YES!) that data is necessary for scientific discoveries rose from 47% to 67%, and that working with data is important from 38% to 48%. The final three items did not show the same level of impact.

Q. KNOWING HOW DATA IS USED CAN HELP ME IN UNDERSTANDING ISSUES IN MY COMMUNITY (FOR EXAMPLE, ELECTION RESULTS, WATER QUALITY, SCHOOL RANKINGS)

n=21	NO!	no	yes	YES!
Pre	0%	29%	52%	19%
Post	0%	14%	62%	24%

R. PEOPLE WHO WORK WITH DATA DO IMPORTANT WORK

n=21	NO!	no	yes	YES!
Pre	0%	5%	57%	38%
Post	5%	5%	43%	48%

S. DATA IS NECESSARY FOR SCIENTISTS TO MAKE NEW DISCOVERIES

n=21	NO!	no	yes	YES!
Pre	0%	10%	43%	47%
Post	5%	5%	24%	67%

T. I'D RATHER JUST GOOGLE SOMETHING THAN EXPLORE THE DATA OR GRAPHS ON MY OWN

n=21	NO!	no	yes	YES!
Pre	5%	52%	29%	14%
Post	0%	19%	57%	24%

J. KNOWING HOW DATA IS USED/PRESENTED WILL HELP ME UNDERSTAND HOW THE WORLD WORKS

n=21	All the time (1)	Most of the time (2)	Sometimes (3)	Never (4)
Pre	19%	43%	33%	5%
Post	10%	38%	48%	5%

K. UNDERSTANDING HOW TO WORK WITH DATA WILL HELP ME DO WELL IN:

n=21	All classes (1)	Most classes (2)	Some classes (3)	None of my classes (4)
Pre	19%	48%	33%	0%
Post	10%	38%	38%	14%