COMPLETE MATCHED DATA

The information shown in these tables encompasses all of the surveys that we have received throughout the life of the project from individuals from whom we have both pre and post surveys , including those class taught by Xiao and Schumacher as well class co-taught by two of the professors from Westfield. All comparisons are based on paired-samples t-tests.

On these tables, p-values from the t-tests and effect sizes are color coded. That color coding is done as follows:

P values	$p < .001$ Undesired direction	$.001 \leq p < .01$ Undesired direction	$.01 \leq p < .05$ Undesired direction	$p > .05$	$.01 \leq p < .05$ Desired direction	$.001 \leq p < .01$ Desired direction	$p < .001$ Desired direction
Effect sizes	$ES > .8$ Undesired direction	$.8 > ES > .4$ Undesired direction	$.4 > ES > .2$ Undesired direction	$ES < .2$	$ES > .8$ Desired direction	$.8 > ES > .4$ Desired direction	$.4 > ES > .2$ Desired direction

The common items across the various tables are as follows:

N is the number of respondents
Mean is the mean of these responses
Diff = Post mean – Pre mean
P is the value from the t-test
ES = effect size

The scale for the individual responses is shown for each table where it is not already provided in the column headers.

Demographics

Student demographics – Pre/Post	Total
Female	250
Male	198
Other	0
African American or Black	37
Asian	8
Hispanic, Latino, or Chicano	29
Native American or Alaska Native	8
White	387
Other	4
Freshman/First Year	199
Sophomore/Second Year	150
Junior/Third Year	60
Senior	37

Understanding the Field of Mathematics (Goals 1-4); Student agreement with statements about the field of mathematics.

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q50. Mathematics is something that only really smart people can do	443	8	54	89	234	57	2.38	445	9	36	81	221	97	2.18	-0.20	.000	-.218
Q51. Mathematics requires creativity	440	20	204	134	69	12	3.34	443	66	280	62	27	8	3.84	0.50	.000	.579
Q52. Doing mathematics for its own sake is as valuable as composing music, creating art, or other intellectual endeavors.	438	27	182	173	41	12	3.40	443	76	234	102	22	5	3.81	0.42	.000	.500
Q53. Computers can do all the mathematics that is really needed, so mathematics is not that important anymore.	442	13	51	90	228	59	2.39	443	9	31	75	210	118	2.09	-0.30	.000	-.318
Q54. A major reason why mathematicians engage in mathematicians is because they find it beautiful.	418	38	209	127	29	3	3.62	439	131	238	58	10	0	4.13	0.51	.000	.678
Q55. Mathematics requires curiosity.	439	65	270	83	18	2	3.86	441	134	262	36	7	2	4.19	0.33	.000	.473
Q56. There are debates within mathematics	438	89	287	43	11	3	4.03	444	189	225	24	4	2	4.35	0.31	.000	.466
Q57. Mathematics is more than the arithmetical skills needed in everyday life	442	76	275	70	16	4	3.91	445	143	246	41	11	3	4.16	0.25	.000	.332

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q58. Mathematics is mostly a tool for the sciences.	442	25	161	147	99	9	3.22	442	18	96	139	163	24	2.82	-0.39	.000	-.414
Q59. Mathematics are excited and passionate about their work.	429	102	256	64	2	2	4.07	436	193	208	29	3	2	4.35	0.28	.000	.412
Q60. There is still a lot of mathematics for me to discover.	442	122	234	66	10	7	4.04	441	178	208	42	8	5	4.24	0.21	.000	.259
Q61. Someday, all of mathematics will be figured out.	421	10	33	101	190	79	2.27	428	13	30	68	170	140	2.05	-0.22	.000	-.224
Q62. Mathematics has had and still has an impact on shaping history, culture, logic, philosophy, and knowledge.	442	95	254	78	10	3	3.98	442	147	230	54	3	6	4.16	0.18	.000	.241
Q63. There are still unsolved problems in mathematics.	439	166	229	37	1	1	4.29	444	230	193	16	1	3	4.45	0.17	.000	.258

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Pre							Post							Diff.	P	ES
	N	Almost none	Less than 1,000	1K-10K	10K-1M	1M-10M	More than 10M	Mean	N	Almost none	Less than 1,000	1K-10K	10K-1M	1M-10M	More than 10M	Mean	
Q28. Student responses about the number of mathematicians there are in the world.	446	1	18	90	153	108	76	4.29	444	0	22	61	136	115	110	4.52	0.23	.000	.201

Question	Pre				Post				Diff.	P	ES
	N	Yes	No	Mean	N	Yes	No	Mean			
Q26. Can you name one mathematician, who is still alive and describe what you think he/she does?	446	45	401	0.10	443	247	196	0.56	0.46	.000	1.114
Q27. Can you name or describe a famous unsolved or recently solved problem in mathematics?	443	21	422	0.05	441	229	212	0.52	0.48	.000	1.227
Q29. Can you name or describe a historically important, generally accepted belief or theory that was changed through mathematical thinking?	443	76	367	0.18	384	128	256	0.33	0.15	.000	.349
Q30. Can you name or describe a surprising mathematical aspect of or idea in, your personal environment that you have noticed outside of your mathematics class?	446	47	399	0.11	440	169	271	0.38	0.28	.000	.663

Where Students See Mathematics Playing a Significant Role

Question	Pre				Post				Diff.	P	ES
	N	Yes	No	Mean	N	Yes	No	Mean			
Q31. Visual arts	443	120	314	0.27	443	277	166	0.63	0.35	.000	.760
Q32. Theater	444	65	370	0.15	443	182	261	0.41	0.26	.000	.610
Q33. Music	444	166	270	0.38	443	323	120	0.73	0.35	.000	.759
Q34. Philosophy	444	108	329	0.24	443	206	237	0.47	0.22	.000	.479
Q35. Reasoning/logic	444	317	125	0.71	443	379	64	0.86	0.14	.000	.354
Q36. History	444	105	330	0.24	443	211	232	0.48	0.24	.000	.510
Q37. Games/puzzles	444	371	70	0.84	443	417	26	0.94	0.10	.000	.340
Q38. Language	444	42	393	0.10	443	125	318	0.28	0.18	.000	.486
Q39. Technology	444	390	53	0.88	443	414	29	0.94	0.06	.000	.204
Q40. Science	444	415	29	0.94	443	431	12	0.97	0.04	.008	.175
Q41. Engineering	444	413	29	0.93	443	432	11	0.97	0.04	.002	.206
Q42. Arithmetic	444	372	70	0.84	443	411	32	0.93	0.09	.000	.287
Q43. Architecture	444	384	60	0.87	443	416	27	0.94	0.07	.000	.249
Q44. Literature	444	25	410	0.06	443	112	331	0.25	0.19	.000	.557
Q45. Formal decision making	444	191	251	0.43	443	291	152	0.66	0.23	.000	.469
Q46. Understanding of nature	444	117	319	0.27	443	231	212	0.52	0.26	.000	.540
Q47. Economics	444	392	49	0.89	443	416	27	0.94	0.05	.002	.186
Q48. Dance	444	112	324	0.26	443	247	196	0.56	0.30	.000	.648
Q49. Criminal justice	444	197	242	0.44	443	275	168	0.62	0.18	.000	.362

Students Thinking about Mathematics (Goals 5 & 7); Student relationships with mathematics.

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q02. I like to ask "why" and understand how things work.	444	78	243	97	22	4	3.83	448	102	236	80	28	2	3.91	0.08	.061	.097
Q03. I am able to understand and critique written or spoken mathematical arguments.	440	10	87	180	130	30	2.80	445	34	181	147	65	18	3.34	0.54	.000	.581
Q06. I often think I understand something and later realize that I don't.	443	49	167	132	86	8	3.37	448	49	147	147	92	13	3.29	-0.08	.106	-.085
Q07. I'm often aware of situations where my initial understanding is incomplete.	439	30	209	150	40	2	3.53	447	41	246	107	48	4	3.62	0.09	.043	.113
Q08. Thoughts and ideas that come to me while working on mathematical problems will often get me closer to a solution.	436	28	223	130	43	8	3.51	446	78	264	81	16	5	3.89	0.38	.000	.479
Q10. My thoughts and ideas matter when solving a mathematical problem.	438	41	234	112	37	7	3.62	446	102	271	55	13	5	4.02	0.41	.000	.520
Q13. When I get stuck on a problem, I believe that I will eventually be able to figure it out by myself.	446	9	146	157	117	17	3.03	444	22	183	135	89	15	3.25	0.22	.000	.240
Q14. When I get stuck on a problem, I believe that I will eventually be able to figure it out with the help of my peers.	446	62	296	72	11	3	3.91	446	99	274	59	9	5	4.02	0.11	.005	.157

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q15. I don't think mathematics can be beautiful.	436	41	118	151	87	30	3.12	442	14	54	129	156	85	2.44	-0.68	.000	-.650
Q16. Making mathematical mistakes is okay because it is a natural part of making sense of mathematics.	443	78	293	53	16	2	3.97	445	134	270	31	8	2	4.19	0.21	.000	.317
Q17. I can't clearly explain my mathematical thinking.	441	35	159	149	88	6	3.29	445	39	125	122	146	11	3.08	-0.22	.000	-.221
Q18. In order to make sense of mathematics, I need to understand the precise meaning of terms.	443	72	232	115	22	1	3.80	443	57	199	135	50	2	3.58	-0.22	.000	-.264
Q19. If I hear a valid argument that is not in line with my reasoning, I am willing to change my thinking.	445	42	290	95	16	1	3.80	446	73	275	82	11	4	3.91	0.10	.006	.151
Q21. I learn mathematics best when I explain ideas to other students.	440	13	113	169	118	21	2.95	442	46	158	150	75	13	3.35	0.40	.000	.426
Q22. I learn mathematics best when I work on problems in small groups.	443	84	200	97	50	10	3.67	445	128	218	68	23	7	4.00	0.33	.000	.355

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Student Feelings about Mathematics (Goals 8 & 9); Student relationships to mathematics

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q01. I don't think doing mathematics is interesting.	444	48	101	161	108	26	3.08	447	21	59	123	167	77	2.51	-0.57	.000	-.538
Q04. Mathematics doesn't make sense to me.	443	34	84	120	168	37	2.80	446	21	57	141	178	49	2.60	-0.20	.000	-.188
Q09. I believe that I can't learn to make sense of mathematics.	442	14	83	74	205	65	2.49	448	15	74	64	198	97	2.35	-0.14	.027	-.131
Q11. I have a positive attitude about mathematics.	443	26	123	177	86	31	3.06	448	46	177	152	52	20	3.40	0.34	.000	.347
Q20. I feel anxious about mathematics.	443	106	127	121	69	18	3.53	445	64	124	122	113	21	3.22	-0.31	.000	-.272

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

How much did you enjoy…

Question	Pre							Post							Diff.	P	ES
	N	SE	-	Ne	-	NE	Mean	N	SE	-	Ne	-	NE	Mean			
Q23. Working on a challenging mathematical problem	446	13	80	101	94	158	2.31	446	25	127	132	84	78	2.86	0.55	.000	.460
Q24. Discovering a new mathematical idea	443	25	90	141	69	117	2.63	444	70	146	129	55	44	3.34	0.71	.000	.591
Q25. Using rigorous reasoning in a math problem	439	13	58	125	97	143	2.32	444	33	118	147	68	77	2.91	0.60	.000	.511

Key: SE = Strong Enjoyment, Ne = Neutral, NE = No Enjoyment; response labels were not included for intermediate responses

Student prediction / reporting of enjoyment

Question	Pre							Post							Diff.	P	ES
	N	VM	S	Ne	NM	NAA	Mean	N	VM	S	Ne	NM	NAA	Mean			
Q77. Do you think you think you will enjoy this class?/Did you enjoy this class?	234	30	121	61	21	1	3.68	442	177	167	60	20	18	3.98	0.30	.000	.304

Key: VM = Very Much, S = Somewhat, Ne = Neutral, NM = Not Much, NAA = Not At All

Question	Post						
	N	SA	A	Ne	D	SD	Mean
Q75. I think I will remember this class 10 years down the road.	441	141	205	65	20	10	4.01

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Post				
	N	Not at all hesitant	Somewhat hesitant	Very hesitant	Mean
Q76. Having taken this class, how hesitant would you be to sign up for another math class?	442	43	192	207	1.63

Interest in Bringing Mathematics into Their Lives (Goal 11); Student relationship to mathematics

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q05. Thinking in a mathematical way will be helpful to me in my life.	439	33	191	150	47	16	3.40	443	62	209	126	36	10	3.63	0.23	.000	.256
Q12. Outside of its everyday uses, nothing I learn about mathematics will impact my daily life.	443	21	88	106	187	40	2.69	442	10	60	95	201	75	2.39	-0.31	.000	-.302

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Changes associated with participation

How have you changed in the following areas due to your participation in this course?

Question	Post							
	N	Increased a lot	Increased a little	No change (stayed high)	No change (stayed low)	Decreased a little	Decreased a lot	Percent Increase
Q64. My ability to think and reason more effectively	440	162	221	40	14	2	1	87%
Q65. My ability to express myself clearly when talking	439	93	231	78	35	1	1	74%
Q66. My ability to express myself in writing	440	113	194	92	39	1	1	70%
Q67. My ability to read and understand mathematical problems	440	120	228	49	36	5	2	79%
Q68. Likelihood that I will read mathematics papers or books	441	29	103	77	196	19	17	30%
Q69. Likelihood that I will talk about mathematics with others outside of a math class	441	54	137	64	161	10	15	43%
Q70. Likelihood that I will go to a talk or watch a video about mathematics not associated with a math class	441	45	122	73	177	8	16	38%
Q71. My curiosity about the world around me has…	439	138	177	97	23	1	3	72%
Q72. My awareness of how I approach and solve problems has…	441	147	207	56	26	3	2	80%
Q73. My sense of empowerment as a learner has…	441	119	191	86	34	7	4	70%
Q74. My confidence in my ability to take responsibility for my own learning has…	441	140	176	91	21	9	4	72%

COMPLETE UNMATCHED DATA

The information shown in these tables encompasses all of the surveys that we have received throughout the life of the project, including those class taught by Xiao and Schumacher as well class co-taught by two of the professors from Westfield. All comparisons are based on independent-samples t-tests.

The information shown in these tables encompasses the surveys that we have received throughout the life of the project from individuals from whom we have both pre and post surveys as taught by the professors from Westfield in Fall 2015 and Spring 2016. Data from Xiao and Schumacher are not included. All comparisons are based on paired-samples t-tests.

On these tables, p-values from the t-tests and effect sizes are color coded. That color coding is done as follows:

	$p < .001$ Undesired direction	$.001 \leq p < .01$ Undesired direction	$.01 \leq p < .05$ Undesired direction		$.01 \leq p < .05$ Desired direction	$.001 \leq p < .01$ Desired direction	$p < .001$ Desired direction
P values				$p > .05$			
Effect sizes	$ES > .8$ Undesired direction	$.8 > ES > .4$ Undesired direction	$.4 > ES > .2$ Undesired direction	$ES < .2$	$ES > .8$ Desired direction	$.8 > ES > .4$ Desired direction	$.4 > ES > .2$ Desired direction

The common items across the various tables are as follows:

N is the number of respondents
Mean is the mean of these responses
Diff = Post mean – Pre mean
P is the value from the t-test
ES = effect size

The scale for the individual responses is shown for each table where it is not already provided in the column headers.

Demographics

Student demographics - Pre	Total
Female	397
Male	382
Other	2
African American or Black	57
Asian	16
Hispanic, Latino, or Chicano	67
Native American or Alaska Native	7
White	677
Other	7
Freshman/First Year	314
Sophomore/Second Year	277
Junior/Third Year	118
Senior	73
Student demographics - Post	**Total**
Female	339
Male	288
Other	2
African American or Black	38
Asian	13
Hispanic, Latino, or Chicano	48
Native American or Alaska Native	9
White	549
Other	6
Freshman/First Year	262
Sophomore/Second Year	227
Junior/Third Year	83
Senior	57

Understanding the Field of Mathematics (Goals 1-4); Student agreement with statements about the field of mathematics.

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q50. Mathematics is something that only really smart people can do	782	15	92	175	407	93	2.70	632	10	55	119	324	124	2.21	-0.19	.000	-.209
Q51. Mathematics requires creativity	778	31	348	249	129	21	3.31	631	95	378	110	39	9	3.81	0.50	.000	.584
Q52. Doing mathematics for its own sake is as valuable as composing music, creating art, or other intellectual endeavors.	768	44	310	311	78	25	3.35	628	101	331	150	37	9	3.76	0.41	.000	.481
Q53. Computers can do all the mathematics that is really needed, so mathematics is not that important anymore.	776	22	88	182	388	96	2.52	632	16	51	111	297	157	2.16	-0.36	.000	-.376
Q54. A major reason why mathematicians engage in mathematicians is because they find it beautiful.	716	70	365	226	50	5	3.62	618	176	337	87	16	2	4.08	0.46	.000	.602
Q55. Mathematics requires curiosity.	775	101	491	145	34	4	3.84	628	186	375	53	12	2	4.16	0.32	.000	.457
Q56. There are debates within mathematics	762	143	505	88	20	6	4.00	628	248	332	43	5	-	4.31	0.31	.000	.465
Q57. Mathematics is more than the arithmetical skills needed in everyday life	779	127	478	137	32	5	3.89	632	203	344	70	13	2	4.16	0.27	.000	.369

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q58. Mathematics is mostly a tool for the sciences.	780	42	262	266	197	13	3.16	626	28	143	197	223	35	2.85	-0.31	.000	-.327
Q59. Mathematics are excited and passionate about their work.	757	172	445	129	7	4	4.02	621	262	298	53	8	-	4.31	0.29	.000	.422
Q60. There is still a lot of mathematics for me to discover.	777	210	407	131	20	9	4.02	628	244	292	71	15	6	4.20	0.18	.000	.224
Q61. Someday, all of mathematics will be figured out.	725	16	64	183	332	130	2.32	598	14	46	106	242	190	2.08	-0.24	.000	-.247
Q62. Mathematics has had and still has an impact on shaping history, culture, logic, philosophy, and knowledge.	774	162	450	141	16	5	3.97	628	199	332	84	7	6	4.13	0.16	.000	.217
Q63. There are still unsolved problems in mathematics.	762	281	399	75	4	3	4.25	631	309	287	31	3	1	4.43	0.18	.000	.275

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Pre							Post							Diff.	P	ES
	N	Almost none	Less than 1,000	1K-10K	10K-1M	1M-10M	More than 10M	Mean	N	Almost none	Less than 1,000	1K-10K	10K-1M	1M-10M	More than 10M	Mean			
Q28. Student responses about the number of mathematicians there are in the world.	795	7	38	158	269	202	121	4.24	634	1	33	99	205	157	139	4.42	0.18	.003	.158

Question	Pre				Post				Diff.	P	ES
	N	Yes	No	Mean	N	Yes	No	Mean			
Q26. Can you name one mathematician, who is still alive and describe what you think he/she does?	793	71	722	0.09	632	322	310	0.51	0.42	.000	1.062
Q27. Can you name or describe a famous unsolved or recently solved problem in mathematics?	787	40	747	0.05	628	295	333	0.47	0.42	.000	1.133
Q29. Can you name or describe a historically important, generally accepted belief or theory that was changed through mathematical thinking?	789	140	649	0.18	553	172	381	0.31	0.13	.000	.312
Q30. Can you name or describe a surprising mathematical aspect of or idea in, your personal environment that you have noticed outside of your mathematics class?	790	86	704	0.11	629	222	407	0.35	0.24	.000	.609

Where Students See Mathematics Playing a Significant Role

Question	Pre				Post				Diff.	P	ES
	N	Yes	No	Mean	N	Yes	No	Mean			
Q31. Visual arts	785	219	566	0.28	632	384	248	0.61	0.33	.000	.706
Q32. Theater	785	111	674	0.14	632	250	382	0.40	0.26	.000	.623
Q33. Music	785	310	475	0.39	632	458	174	0.72	0.33	.000	.701
Q34. Philosophy	785	179	606	0.23	632	288	344	0.46	0.23	.000	.504
Q35. Reasoning/logic	785	556	229	0.71	632	528	104	0.84	0.13	.000	.310
Q36. History	785	182	603	0.23	632	286	346	0.45	0.22	.000	.481
Q37. Games/puzzles	785	639	146	0.81	632	583	49	0.92	0.11	.000	.323
Q38. Language	785	80	705	0.10	632	179	453	0.28	0.18	.000	.478
Q39. Technology	785	697	88	0.89	632	588	44	0.93	0.04	.005	.138
Q40. Science	785	729	56	0.93	632	614	18	0.97	0.04	.000	.177
Q41. Engineering	785	728	57	0.93	632	612	20	0.97	0.04	.000	.269
Q42. Arithmetic	785	648	137	0.83	632	583	49	0.92	0.09	.000	.269
Q43. Architecture	785	674	111	0.86	632	594	38	0.94	0.08	.000	.263
Q44. Literature	785	40	745	0.05	632	153	479	0.24	0.19	.000	.576
Q45. Formal decision making	785	330	455	0.42	632	388	244	0.61	0.19	.000	.387
Q46. Understanding of nature	785	202	583	0.26	632	312	320	0.49	0.23	.000	.493
Q47. Economics	785	682	103	0.87	632	585	47	0.93	0.06	.000	.196
Q48. Dance	785	196	589	0.25	632	335	297	0.53	0.28	.000	.604
Q49. Criminal justice	785	333	452	0.42	632	381	251	0.60	0.18	.000	.365

Students Thinking about Mathematics (Goals 5 & 7); Student relationships with mathematics.

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q02. I like to ask "why" and understand how things work.	804	162	417	174	41	10	3.85	642	147	335	111	41	8	3.89	0.04	.318	.047
Q03. I am able to understand and critique written or spoken mathematical arguments.	786	17	160	325	221	63	2.81	638	45	254	214	101	24	3.31	0.50	.000	.535
Q06. I often think I understand something and later realize that I don't.	798	79	307	247	148	17	3.35	641	73	222	209	122	15	3.34	-0.01	.732	-.010
Q07. I'm often aware of situations where my initial understanding is incomplete.	777	51	382	275	64	5	3.53	637	62	344	164	63	4	3.62	0.09	.023	.114
Q08. Thoughts and ideas that come to me while working on mathematical problems will often get me closer to a solution.	781	48	381	254	84	14	3.47	635	104	365	129	29	8	3.83	0.36	.000	.440
Q10. My thoughts and ideas matter when solving a mathematical problem.	783	74	411	219	66	13	3.60	637	135	381	95	19	7	3.97	0.37	.000	.461
Q13. When I get stuck on a problem, I believe that I will eventually be able to figure it out by myself.	798	24	260	275	207	32	3.05	635	31	247	199	134	24	3.20	0.15	.002	.161
Q14. When I get stuck on a problem, I believe that I will eventually be able to figure it out with the help of my peers.	795	96	534	135	22	8	3.87	637	130	388	98	16	5	3.98	0.11	.003	.156

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q15. I don't think mathematics can be beautiful.	767	82	208	282	150	45	3.17	625	28	85	192	213	107	2.54	-0.63	.000	-.596
Q16. Making mathematical mistakes is okay because it is a natural part of making sense of mathematics.	788	137	508	113	26	4	3.95	634	180	378	57	16	3	4.13	0.18	.000	.255
Q17. I can't clearly explain my mathematical thinking.	786	70	283	273	150	10	3.32	633	55	185	176	197	20	3.09	-0.23	.000	-.236
Q18. In order to make sense of mathematics, I need to understand the precise meaning of terms.	787	111	419	209	46	2	3.75	634	85	286	185	73	5	3.59	-0.16	.000	-.194
Q19. If I hear a valid argument that is not in line with my reasoning, I am willing to change my thinking.	791	78	506	178	27	2	3.80	636	106	385	122	19	4	3.90	0.10	.008	.145
Q21. I learn mathematics best when I explain ideas to other students.	775	21	190	303	217	44	2.91	629	59	228	207	115	20	3.30	0.39	.000	.411
Q22. I learn mathematics best when I work on problems in small groups.	785	143	349	192	80	21	3.65	634	181	305	109	30	9	3.98	0.33	.000	.353

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Student Feelings about Mathematics (Goals 8 & 9); Student relationships to mathematics

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q01. I don't think doing mathematics is interesting.	804	93	176	294	190	51	3.09	641	34	99	174	233	101	2.58	-0.51	.000	-.470
Q04. Mathematics doesn't make sense to me.	802	78	149	209	294	72	2.83	639	26	94	203	251	65	2.63	-0.20	.000	-.187
Q09. I believe that I can't learn to make sense of mathematics.	799	29	138	154	351	127	2.49	638	23	104	108	275	128	2.40	-0.09	.135	-.084
Q11. I have a positive attitude about mathematics.	799	49	231	299	149	71	3.05	640	59	235	231	79	36	3.32	0.27	.000	.265
Q20. I feel anxious about mathematics.	790	175	231	219	136	29	3.49	632	88	182	179	154	29	3.23	-0.26	.000	-.233

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

How much did you enjoy…

Question	Pre							Post							Diff.	P	ES
	N	SE	-	Ne	-	NE	Mean	N	SE	-	Ne	-	NE	Mean			
Q23. Working on a challenging mathematical problem	798	20	134	197	165	282	2.30	639	31	172	193	114	129	2.78	0.48	.000	.405
Q24. Discovering a new mathematical idea	790	44	153	262	129	202	2.63	636	89	200	186	86	75	3.22	0.59	.000	.489
Q25. Using rigorous reasoning in a math problem	784	18	95	240	175	256	2.29	633	47	154	203	100	129	2.83	0.54	.000	.465

Key: SE = Strong Enjoyment, Ne = Neutral, NE = No Enjoyment; response labels were not included for intermediate responses

Student prediction / reporting of enjoyment

Question	Pre							Post							Diff.	P	ES
	N	VM	S	Ne	NM	NAA	Mean	N	VM	S	Ne	NM	NAA	Mean			
Q77. Do you think you think you will enjoy this class?/Did you enjoy this class?	470	66	229	124	44	7	3.64	631	234	229	101	37	30	3.95	0.31	.000	.307

Key: VM = Very Much, S = Somewhat, Ne = Neutral, NM = Not Much, NAA = Not At All

Question	Post						
	N	SA	A	Ne	D	SD	Mean
Q75. I think I will remember this class 10 years down the road.	630	192	273	105	40	20	3.92

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Question	Post				
	N	Not at all hesitant	Somewhat hesitant	Very hesitant	Mean
Q76. Having taken this class, how hesitant would you be to sign up for another math class?	630	277	285	68	1.67

Interest in Bringing Mathematics into Their Lives (Goal 11); Student relationship to mathematics

Question	Pre							Post							Diff.	P	ES
	N	SA	A	Ne	D	SD	Mean	N	SA	A	Ne	D	SD	Mean			
Q05. Thinking in a mathematical way will be helpful to me in my life.	790	61	327	275	100	27	3.37	632	80	294	180	60	18	3.57	0.20	.000	.216
Q12. Outside of its everyday uses, nothing I learn about mathematics will impact my daily life.	787	34	168	197	328	60	2.73	631	19	87	146	278	101	2.44	-0.29	.000	-.286

Key: SA = Strongly Agree, A = Agree, Ne = Neutral, D = Disagree, SD = Strongly Disagree

Changes associated with participation

How have you change in the following areas due to your participation in this course?

Question		Post						
	N	Increased a lot	Increased a little	No change (stayed high)	No change (stayed low)	Decreased a little	Decreased a lot	Percent Increase
Q64. My ability to think and reason more effectively	628	218	312	71	23	2	2	0.84
Q65. My ability to express myself clearly when talking	628	128	316	126	56	1	1	0.71
Q66. My ability to express myself in writing	625	146	270	148	58	1	2	0.67
Q67. My ability to read and understand mathematical problems	628	163	327	70	56	9	3	0.78
Q68. Likelihood that I will read mathematics papers or books	630	43	146	103	282	27	29	0.30
Q69. Likelihood that I will talk about mathematics with others outside of a math class	630	72	201	85	227	17	28	0.43
Q70. Likelihood that I will go to a talk or watch a video about mathematics not associated with a math class	630	63	181	93	252	12	29	0.39
Q71. My curiosity about the world around me has…	627	183	255	145	36	3	5	0.70
Q72. My awareness of how I approach and solve problems has…	628	196	296	86	41	3	6	0.78
Q73. My sense of empowerment as a learner has…	630	163	273	125	50	9	10	0.69
Q74. My confidence in my ability to take responsibility for my own learning has…	630	183	253	138	33	12	11	0.69