Longitudinal/Cross-Sectional Study of the Impact of *Mathematics in Context* on Student Performance

Student Background Data for 1999–2000 (Grades 7 & 8)

(Technical Report #20a, b)

Thomas A. Romberg, Lorene Folgert, Mary C. Shafer, Teresa Arauco

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March 2002

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INTRODUCTION

The purposes of the longitudinal/cross-sectional study of the impact of *Mathematics in Context* (MiC; National Center for Research in Mathematical Sciences Education & Freudenthal Institute, 1997–1998) on student performance are (a) to determine the mathematical knowledge, understanding, attitudes, and levels of student performance as a consequence of studying MiC for over three years; and (b) to compare student knowledge, understanding, attitudes, and levels of performance of students using MiC with those using conventional mathematics curricula. The research model for this study is an adaptation of a structural model for monitoring changes in school mathematics (Romberg, 1987). For this study, information is being gathered on 14 variables over a 3-year period for three groups of students (those in Grades 7 and 8 in 1999). The variables have been organized in five categories (prior, independent, intervening, outcome, and consequent). (See Figure 1 for variables and hypothesized relationships.)

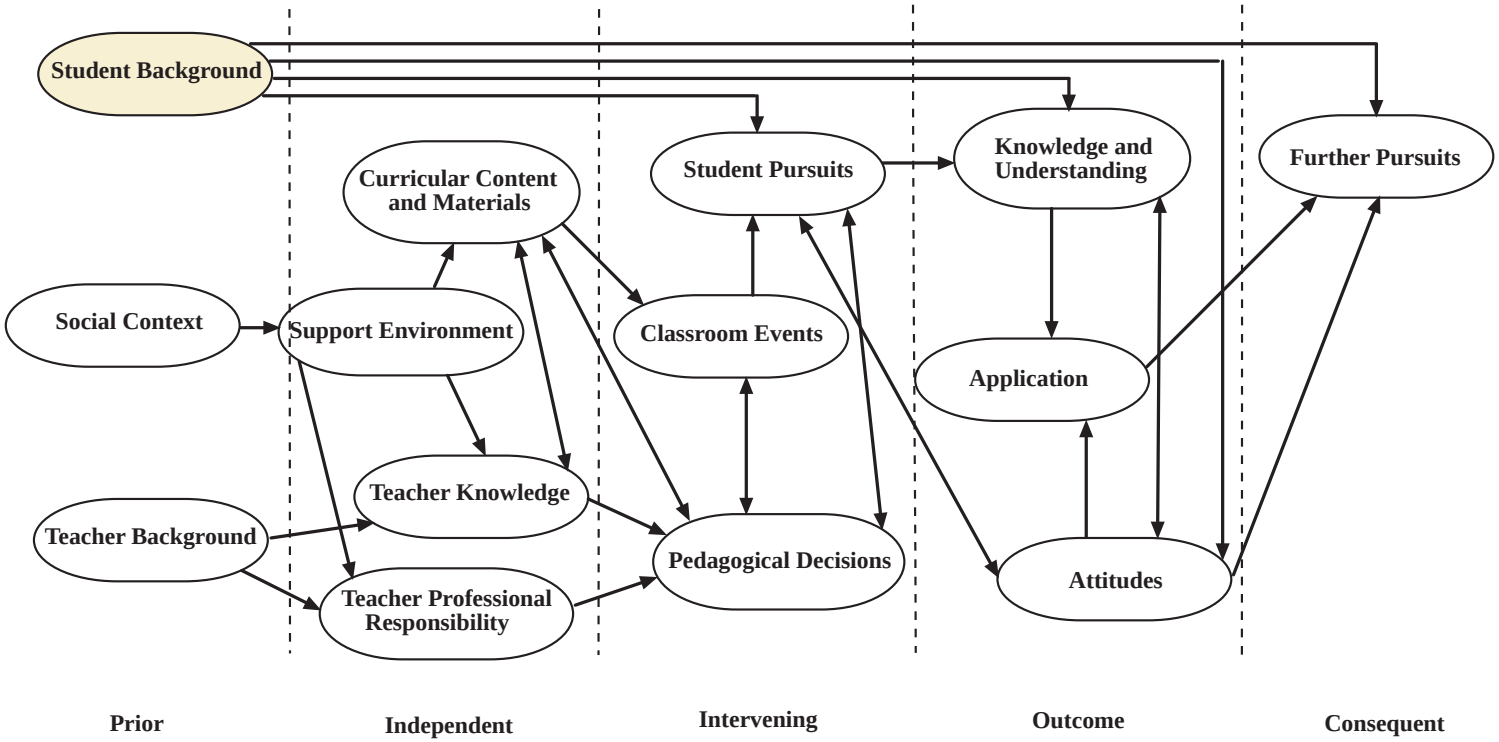

Figure 1. Revised structural model, with variables and hypothesized relationships, for the monitoring of change in school mathematics.

The purpose of this technical paper is to summarize the information of the *Student Background* variable collected in 1999 on seventh-grade classes at the beginning of the longitudinal/cross-sectional study of the impact of *Mathematics in Context* on student performance. The purpose of gathering this information was to describe similarities and differences in seven class characteristics prior to instruction (see Figure 2). Three fixed characteristics for the students in each class—gender, preferred language, and ethnicity—were gathered via a Student Questionnaire (see Appendix A; Shafer, 1997). Three other class characteristics—measures of student mathematical knowledge, student mathematical applications, and disposition toward mathematics—were taken, respectively, from standardized test scores provided by the schools, scores on the project-administered *Collis-Romberg Mathematical Problem-Solving Profiles* (Collis & Romberg, 1992), and student responses to the Student Questionnaire and Student Attitude Inventory (see Appendix B; Shafer, Wagner, & Davis, 1997).

Students of 13 seventh-grade teachers from four school districts participated in the study. Districts are identified by number, and the students by school and teacher (both pseudonyms). Also noted are the type of materials used (MiC materials or a conventional text).

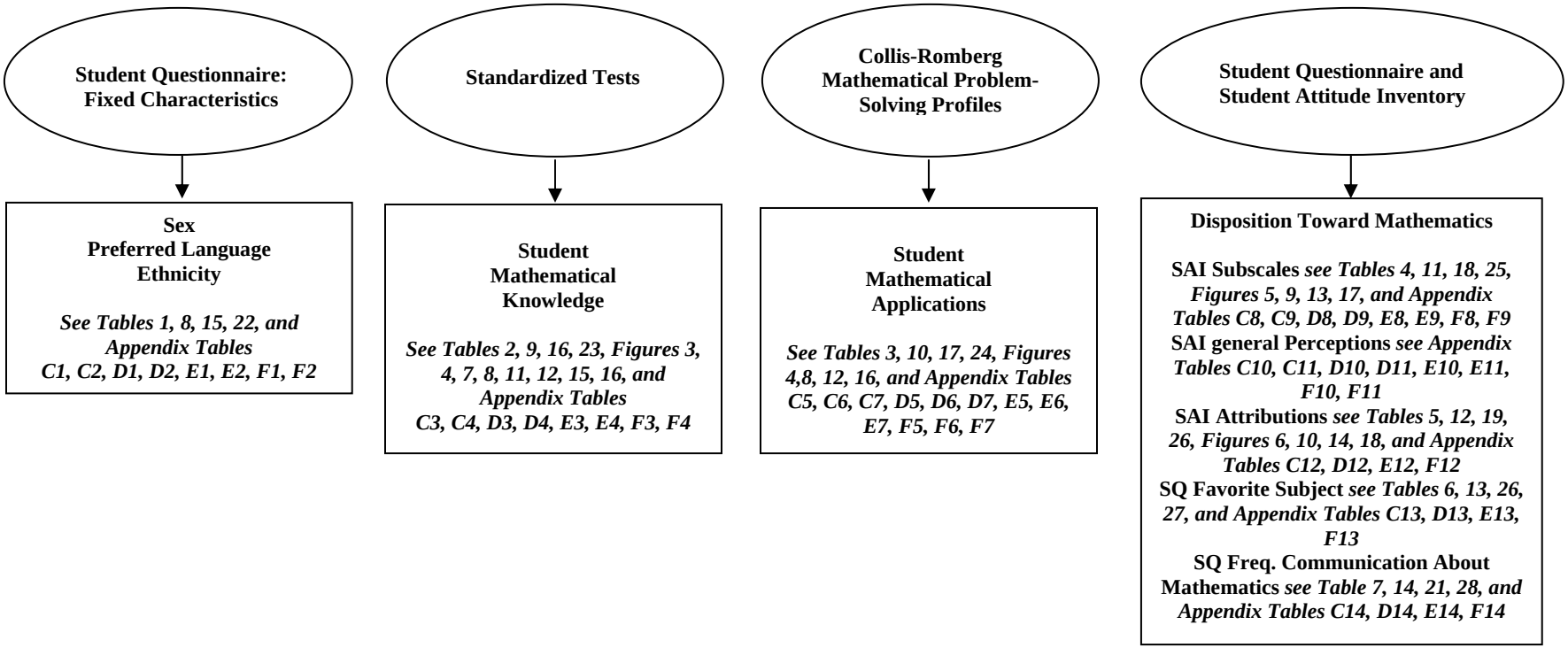

Figure 2. Fixed class characteristics in longitudinal/cross-sectional study of the impact of *Mathematics in Context* on student performance and their sources.

Table 1

Fixed Characteristics for Seventh-Grade Classes in District 1, by Teacher

School-Teacher *(N)*	**Sex *(%)***		**Language Preference *(%)**** *(self-identified)*		**Ethnicity (*%*) **** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
—MiC—									
Addams-St. James (8)	75	25	88	13	38	13	38	13	0
Von Humboldt-Botkin (44)	55	45	77	18	16	9	43	16	16
Von Humboldt-Muldoon (61)	54	46	75	16	20	0	49	16	15
—Conventional—									
Fernwood-Hodge (16)	44	56	88	0	13	13	50	25	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other. (For detailed information, see Tables C1-C2 in Appendix C.)

Table 2

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 1, by Teacher

School-Teacher *(N)*	***(N)***	**TerraNova National Percentile**				
		Mean	**StDev**	**Min**	**Median**	**Max**
		—MiC—				
Addams-St. James (8)	7	37.57	25.99	5	26.0	78
Von Humboldt-Botkin (44)	32	69.75	31.88	5	83.5	99
Von Humboldt-Muldoon (61)	47	64.06	30.43	5	70.0	99
		—Conventional—				
Fernwood-Hodge (16)	9	36.00	24.47	4	35.0	73

(For detailed information, see Tables C3-C4 in Appendix C.)

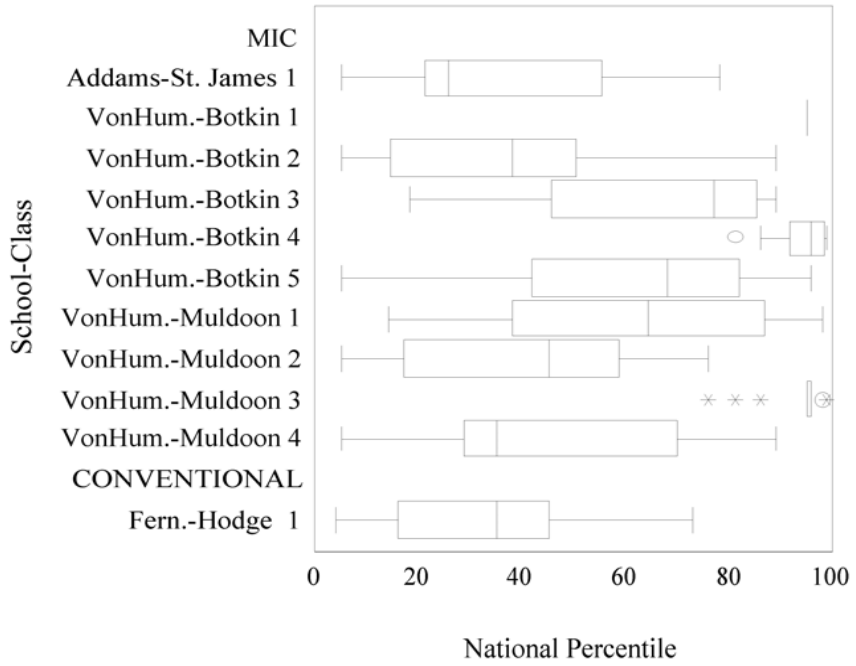

Figure 3. Box plots of class distributions on the *TerraNova* test, Grade 7, District 1.

Table 3

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 1, by Teacher

School-Teacher *(N)*	**Level of Student Performance**				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Addams-St. James (8)	8	3.38	1.50	0.38	0.13
Von Humboldt-Botkin (44)	33	3.64	2.00	0.48	0.03
Von Humboldt-Muldoon (61)	44	3.16	1.45	0.57	0.32
			—Conventional—		
Fernwood-Hodge (16)	12	3.00	1.00	0.25	0.00

(For detailed information, see Tables C5-C7 in Appendix C.)

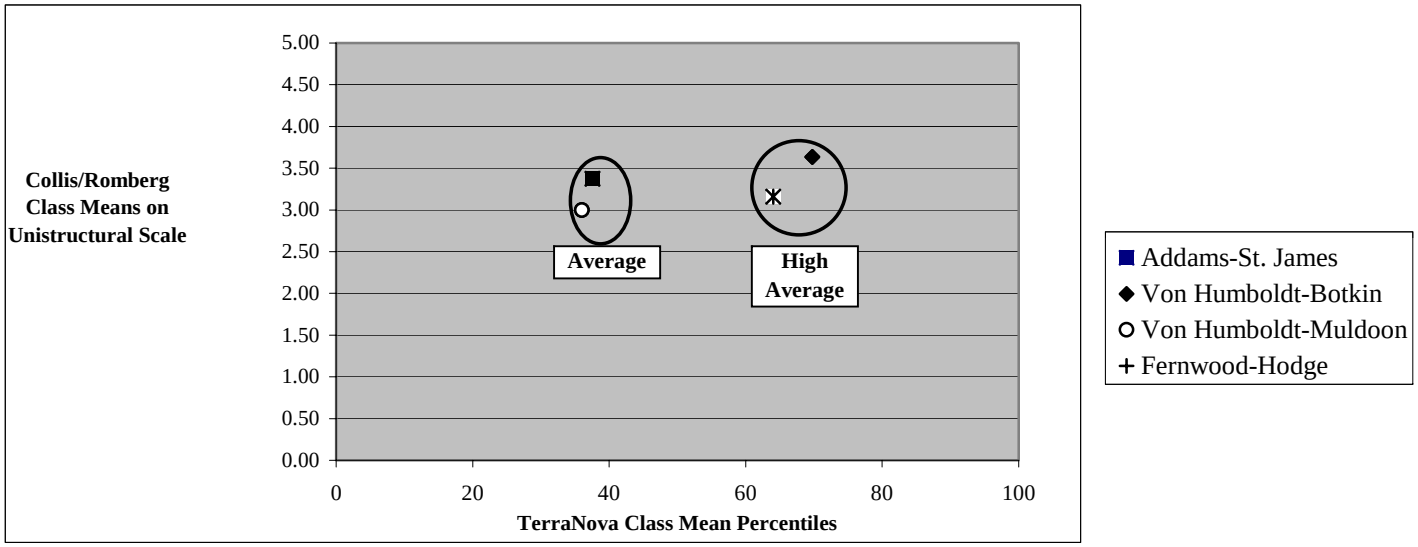

Figure 4. Scatter plot for class mean percentiles on the *TerraNova* test and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 7, District 1.

Table 4

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 1

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Addams-St. James (8)	8	2.02	8	2.05	8	2.20	8	1.57	8	1.88
Von Humboldt-Botkin (44)	35	2.02	35	2.03	35	2.53	35	1.75	35	1.95
Von Humboldt-Muldoon (61)	44	2.12	44	2.04	44	2.52	44	1.87	44	2.14
–Conventional–										
Fernwood-Hodge (16)	13	2.30	13	2.22	13	2.47	13	1.72	13	2.16

(For detailed information, see Tables C8-C9 in Appendix C.)

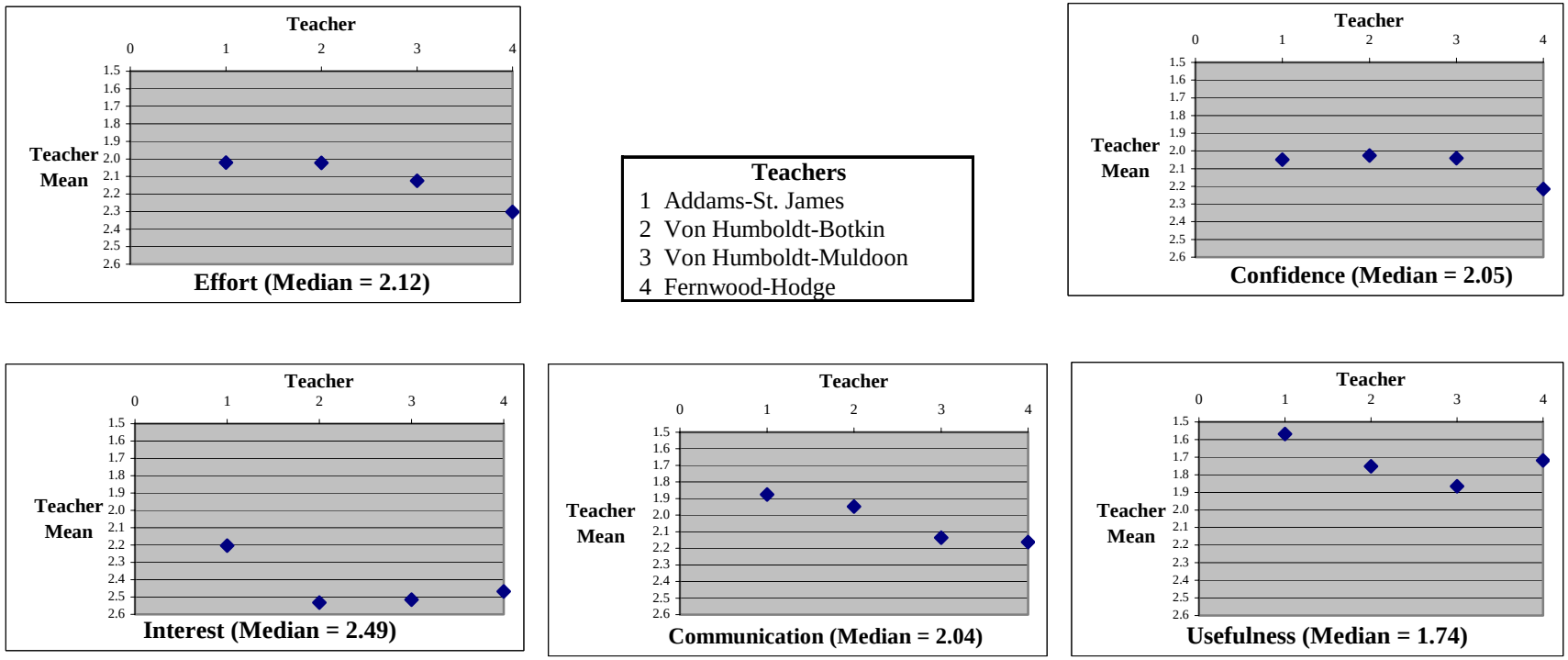

Figure 5. Plots showing class means on student judgments about mathematics, Grade 7, District 1.

Table 5

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 1, by Teacher

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Addams-St. James (8)	8	3.88	8	3.25	8	1.38	8	3.25
Von Humboldt-Botkin (44)	35	3.71	35	2.71	35	1.66	35	3.40
Von Humboldt-Muldoon (61)	44	3.50	44	2.50	44	1.48	44	3.13
–Conventional–								
Fernwood-Hodge (16)	13	3.85	13	2.31	13	1.08	13	3.15

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Addams-St. James (8)	8	3.86	8	3.25	8	2.50	8	3.86
Von Humboldt-Botkin (44)	35	3.69	35	2.94	35	2.17	35	3.43
Von Humboldt-Muldoon (61)	44	3.59	44	3.03	44	2.05	44	3.49
–Conventional–								
Fernwood-Hodge (16)	13	3.46	13	3.08	13	1.5	13	3.54

(For more detailed information, see Table C12 in Appendix C.)

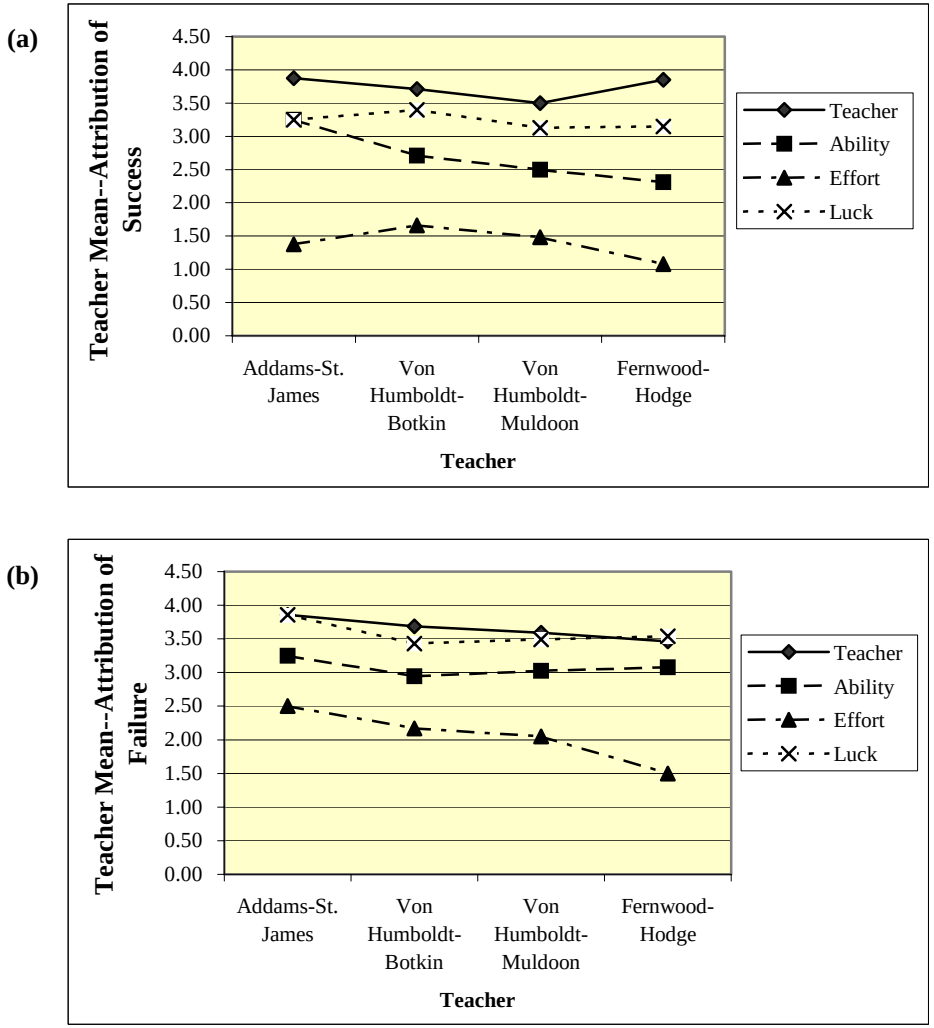

Figure 6. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 7, District 1.

Table 6

Student Preference Ranking of Classes in District 1, Grade 7, by Teacher

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—						
Addams-St. James (8) S[2]	--	--	--	--	--	--	--	--	--	--
Von Humboldt-Botkin (44)	4	4	7	7	0	4	7	36	14	18
Von Humboldt-Muldoon (61)	0	5	10	8	0	5	8	23	26	15
				—Conventional—						
Fernwood-Hodge (16)	0	13	13	7	0	7	0	27	7	27

[1] Other includes mutiple preferences.

[2] Preference data were unavailable.

Note: Response rates designate class mean percents.

(For detailed information, see Tables C13 in Appendix C.)

Table 7

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 1, by Teacher

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— MiC —															
Addams-St. James (8)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Von Humboldt-Botkin (44)	28	25	57	14	4	28	0	50	39	11	28	43	43	14	0
Von Humboldt-Muldoon (61)	38	37	45	11	8	38	13	45	32	11	38	37	45	11	8
—Conventional —															
Fernwood-Hodge (16)	15	19	53	27	0	15	20	53	13	13	15	20	53	13	13

Note: Response rates designate class mean percents.
(For detailed information, see Tables C14 in Appendix C.)

Table 8

Fixed Characteristics for Seventh-Grade Classes in District 2, by Teacher

School-Teacher ***(N)***	**Sex** ***(%)***		**Language Preference** ***(%)**** *(self-identified)*		**Ethnicity (%) **** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
—MiC—									
Guggenheim-Broughton (16)	50	50	100	0	38	25	25	13	0
Guggenheim-Redling (37)	65	35	95	0	11	35	35	19	0
Weir-Flader (19)	72	28	100	0	50	6	0	44	0
—Conventional—									
Von Steuben-Friedman (26)	54	46	81	4	4	23	38	27	8

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other. (For detailed information, see Tables D1-D2 in Appendix D.)

Table 9

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 2, by Teacher

School-Teacher *(N)*	**SAT National Percentile**					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
			—MiC—			
Guggenheim-Broughton (16)	15	37.67	14.79	6	37.0	58
Guggenheim-Redling (37)	33	69.39	23.39	24	73.0	98
Weir-Flader (19)	17	47.35	26.58	10	47.0	81
			—Conventional—			
Von Steuben-Friedman (26)	24	58.58	24.67	6	62.5	98

(For more detailed information, see Tables D3-D4 in Appendix D.)

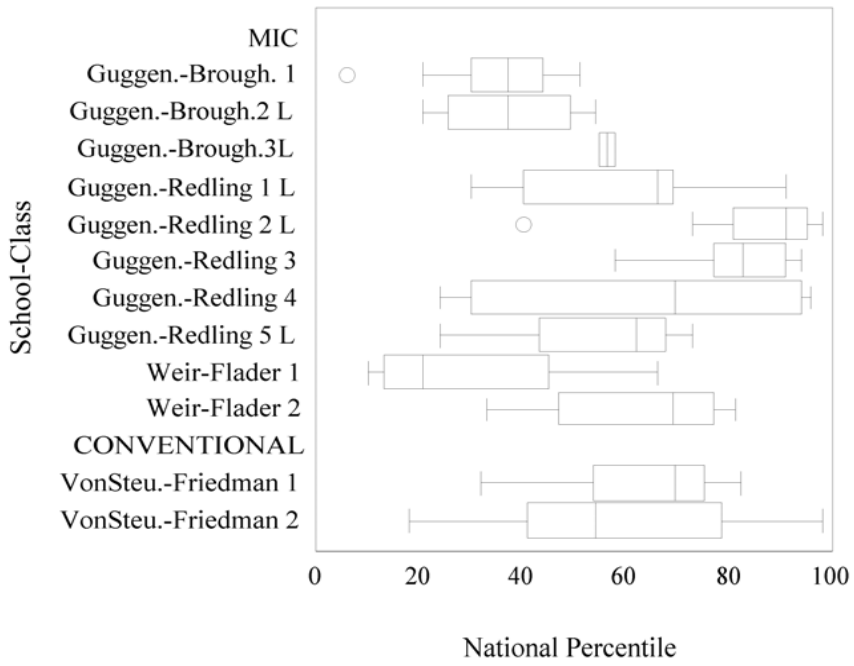

Figure 7. Box plots of class distributions on the *SAT*, Grade 7, District 2.

Table 10

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 2, by Teacher

School-Teacher *(N)*	**Level of Student Performance**				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Guggenheim-Broughton (16)	13	3.23	0.92	0.08	0.00
Guggenheim-Redling (37)	29	3.45	1.62	0.48	0.03
Weir-Flader (19)	15	3.40	1.13	0.13	0.00
			—Conventional—		
Von Steuben-Friedman (26)	18	2.22	0.72	0.17	0.00

(For detailed information, see Tables D5-D7 in Appendix D.)

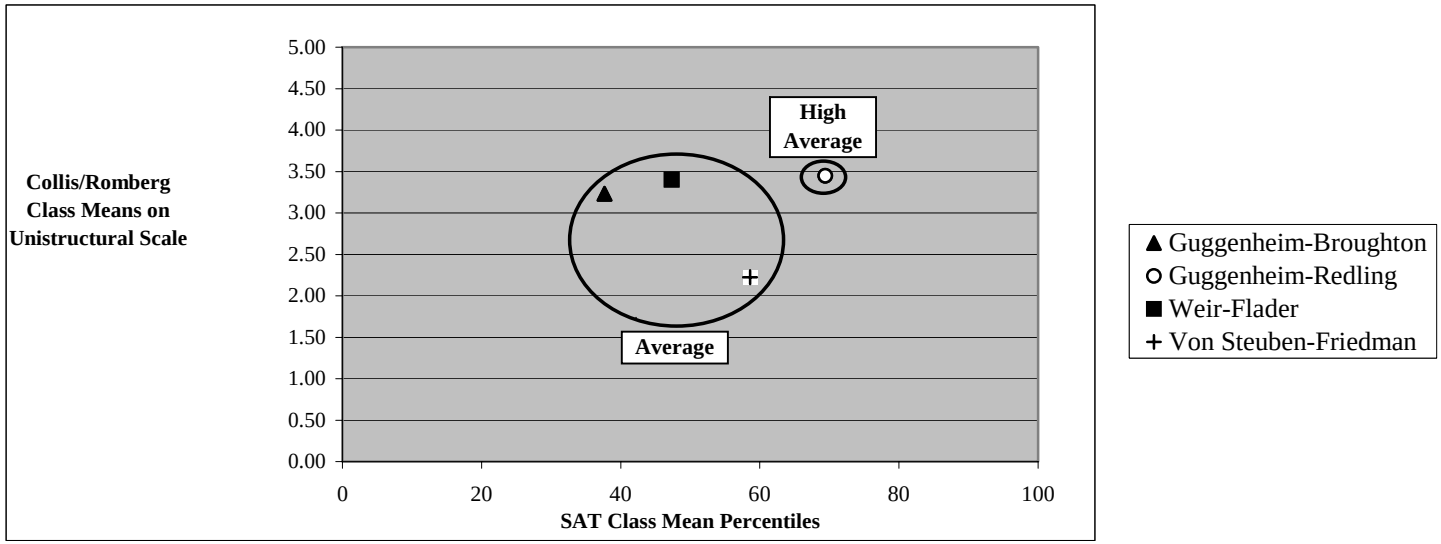

Figure 8. Scatter plot for class mean percentiles on the *SAT* and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 7, District 2.

Table 11

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 2

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Guggenheim-Broughton (16)	15	1.89	15	1.89	15	2.26	15	1.91	15	1.96
Guggenheim-Redling (37)	34	2.13	34	1.98	34	2.49	34	1.86	34	2.14
Weir-Flader (19)	15	1.93	15	1.81	15	1.89	15	1.68	15	1.90
–Conventional–										
Von Steuben-Friedman (26)	16	1.85	16	1.71	16	1.52	16	1.55	16	1.67

(For detailed information, see Tables D8-D9 in Appendix D.)

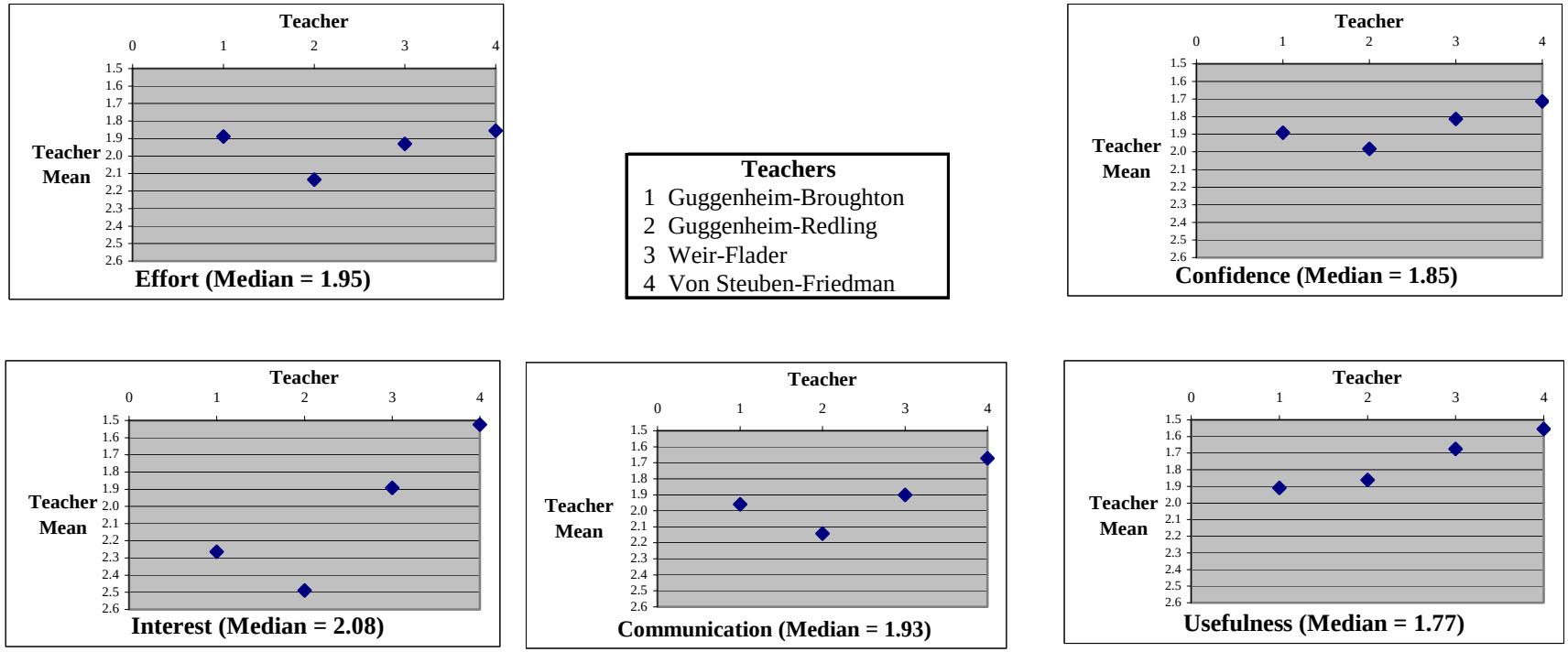

Figure 9. Plots showing class means on student judgments about mathematics, Grade 7, District 2.

Table 12

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 2, by Teacher

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Guggenheim-Broughton (16)	15	3.27	15	1.84	15	1.47	15	3.53
Guggenheim-Redling (37)	34	3.82	34	2.15	34	1.29	34	3.38
Weir-Flader (19)	15	3.80	15	2.73	15	1.20	15	3.40
–Conventional–								
Von Steuben-Friedman (26)	16	3.63	16	2.59	16	1.19	16	3.25

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Guggenheim-Broughton (16)	15	3.87	15	2.93	15	1.67	15	3.27
Guggenheim-Redling (37)	34	3.56	34	2.88	34	1.91	34	3.59
Weir-Flader (19)	15	3.73	15	3.33	15	1.53	15	3.53
–Conventional–								
Von Steuben-Friedman (26)	16	4.00	16	3.06	16	1.81	16	3.56

(For more detailed information, see Table D12 in Appendix D.)

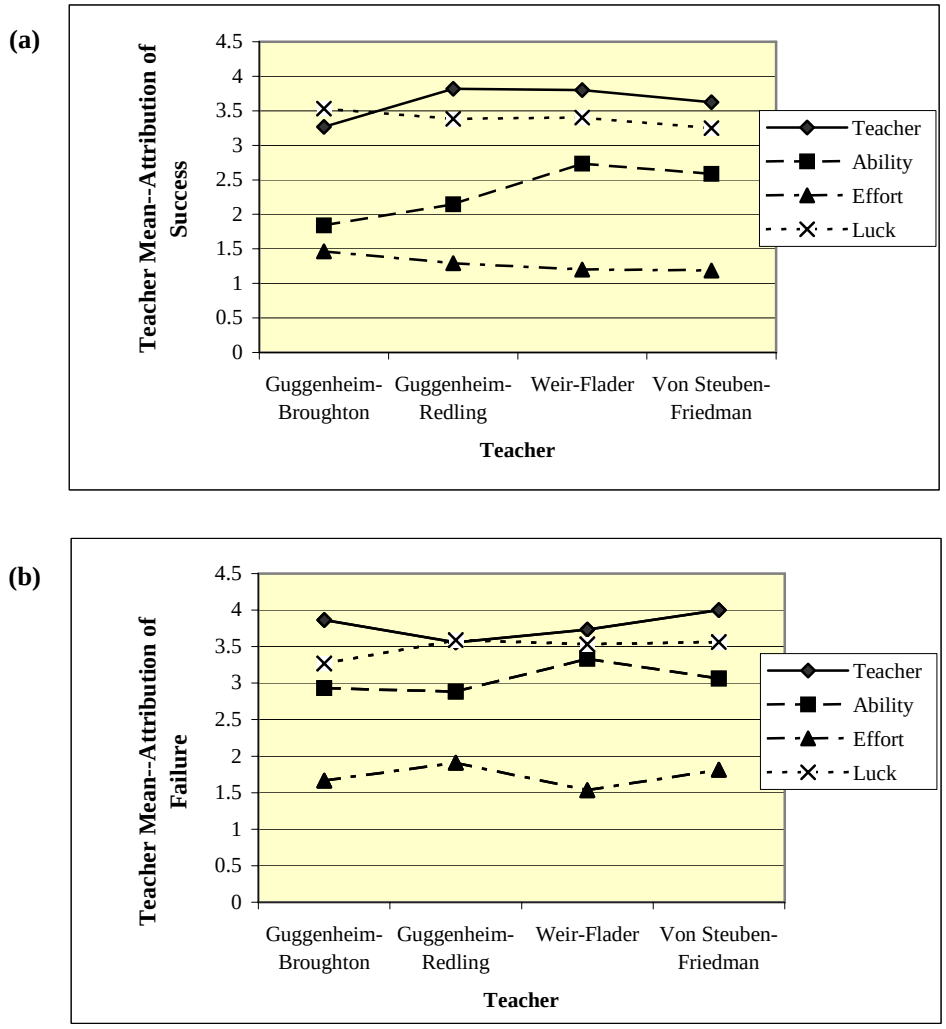

Figure 10. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 7, District 2.

Table 13

Student Preference Ranking of Classes in District 2, Grade 7, by Teacher

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—						
Guggenheim-Broughton (16)	14	0	14	14	7	7	7	7	0	29
Guggenheim-Redling (37)	4	7	4	0	4	11	4	15	0	52
Weir-Flader (19)	11	22	28	11	0	11	11	0	0	6
				—Conventional—						
Von Steuben-Friedman (26) S[2]	--	--	--	--	--	--	--	--	--	--

[1] Other includes mutiple preferences.

[2] Preference data were unavailable.

Note: Response rates designate class mean percents.

(For detailed information, see Tables D13 in Appendix D.)

Table 14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 2, by Teacher

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— MiC —															
Guggenheim-Broughton (16)	14	29	29	29	14	14	7	14	36	43	14	29	21	29	21
Guggenheim-Redling (37)	27	19	63	22	4	27	11	44	33	11	27	41	44	11	4
Weir-Flader (19)	18	22	61	11	6	18	6	33	39	22	18	33	33	11	22
—Conventional —															
Von Steuben-Friedman (26)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-

Note: Response rates designate class mean percents.

(For detailed information, see Tables D14 in Appendix D.)

Table 15

Fixed Characteristics for Seventh-Grade Classes in District 3, by Teacher

School-Teacher ***(N)***	**Sex** ***(%)***		**Language Preference** ***(%)**** *(self-identified)*		**Ethnicity (%) **** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
—MiC—									
Calhoun North-Perry (104)	54	46	99	0	1	3	84	13	0
Calhoun North-Schroeder (2)***	50	50	50	0	0	0	50	50	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and

*** Special education classroom.

(For detailed information, see Tables E1-E2 in Appendix E.)

Table 16

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 3, by Teacher

School-Teacher *(N)*	SAT-9					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
		—MiC—				
Calhoun North-Perry (104)	101	59.75	24.76	11	62.0	99
Calhoun North-Schroeder (2)*	2	21.00	1.41	20	21.0	22

*Special education class

(For more detailed information, see Tables E3-E4 in Appendix E.)

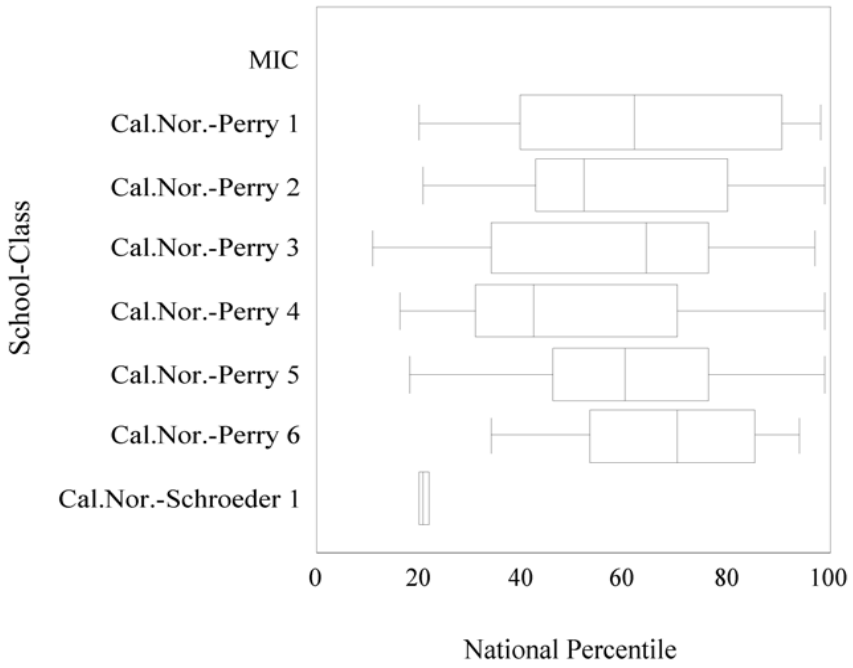

Figure 11. Scatter plot for class mean percentiles on the *SAT-9* and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 7, District 3.

Table 17

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 3, by Teacher

School-Teacher *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
		—MiC—			
Calhoun North-Perry (104)	85	2.94	1.40	0.28	0.02
Calhoun North-Schroeder (2)*	1	0.00	0.00	0.00	0.00

* Special education class

(For detailed information, see Tables E5-E7 in Appendix E.)

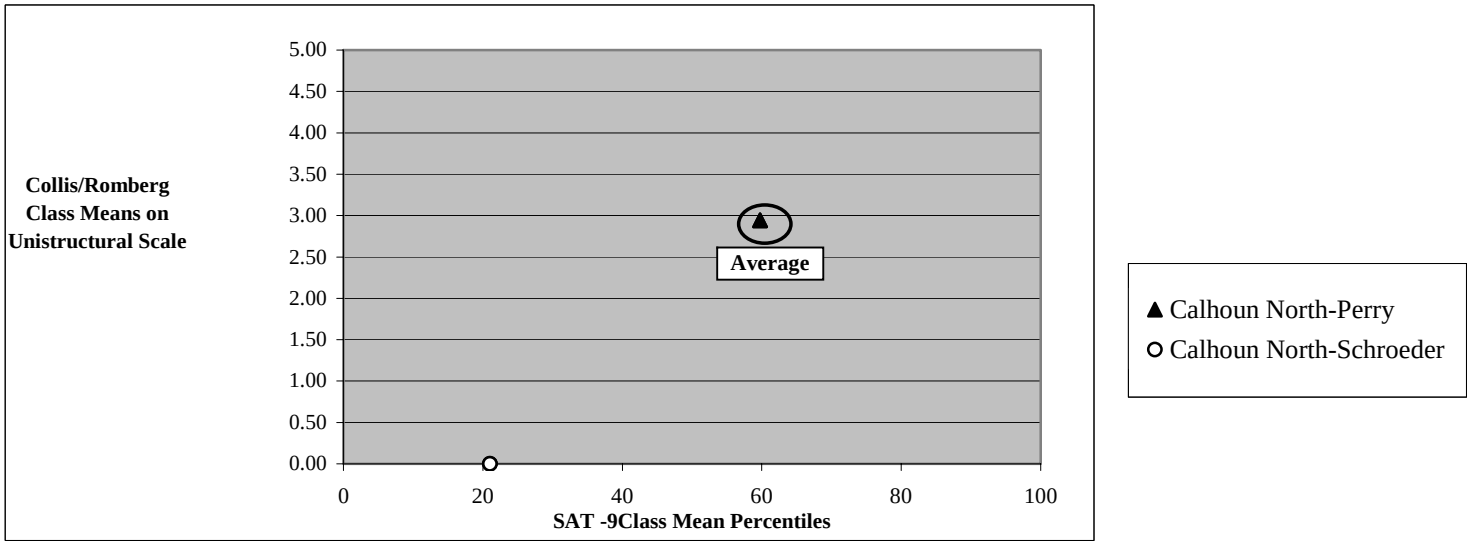

Figure 12. Scatter plot for class mean percentiles on the *SAT-9* and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 7, District 3.

Table 18

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 3

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Calhoun North-Perry (104)	97	1.95	97	1.86	97	2.14	97	1.68	97	1.93
Calhoun North-Schroeder (2)*	2	1.75	2	2.00	2	1.94	2	2.13	2	1.86

* Special education class

(For detailed information, see Tables E8-E9 in Appendix E.)

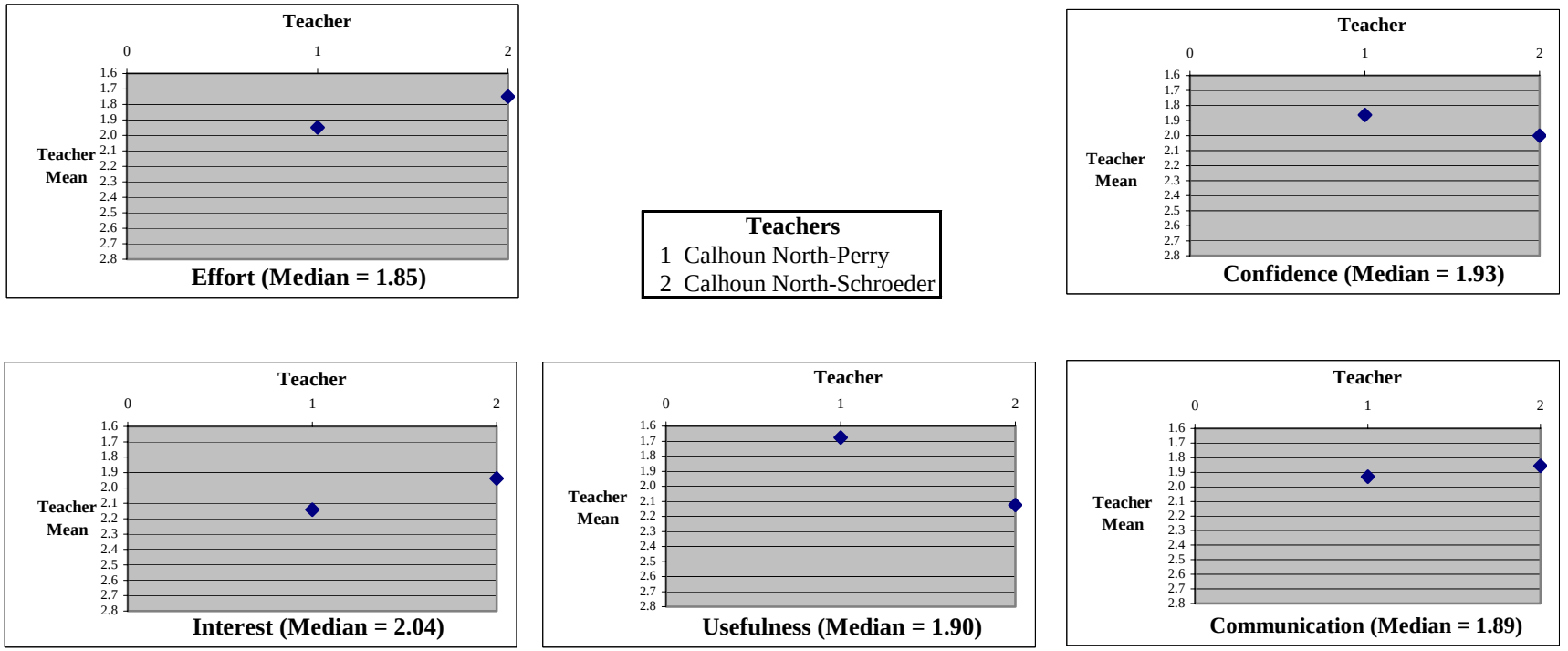

Figure 13. Plots showing class means on student judgments about mathematics, Grade 7, District 3.

Table 19

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 3, by Teacher

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Calhoun North-Perry (104)	97	3.77	97	2.54	97	1.39	97	3.23
Calhoun North-Schroeder (2)*	2	4.00	2	2.00	2	1.00	2	4.00

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Calhoun North-Perry (104)	97	3.73	97	2.97	97	2.06	97	3.46
Calhoun North-Schroeder (2)*	2	4.00	2	3.00	2	3.50	2	4.00

* Special education class

(For more detailed information, see Table E12 in Appendix E.)

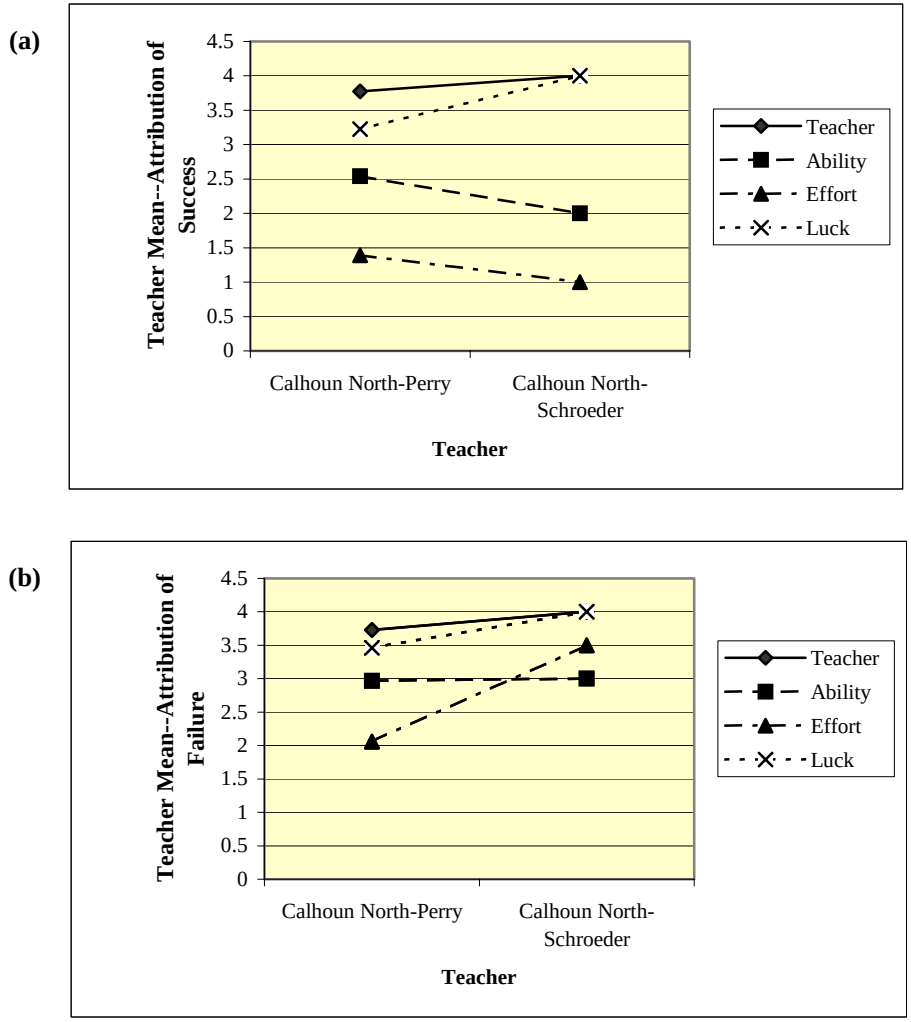

Figure 14. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 7, District 3.

Table 20

Student Preference Ranking of Classes in District 3, Grade 7, by Teacher

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—						
Calhoun North-Perry (104)	8	12	13	4	4	34	1	19	1	4
Calhoun North-Schroeder (2) [2]	0	0	100	0	0	0	0	0	0	0

[1] Other includes mutiple preferences.

[2] Special education class.

Note: Response rates designate class mean percents.

(For detailed information, see Tables E13 in Appendix E.)

Table 21

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 3, by Teacher

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— *MiC* —									
Calhoun North-Perry (104)	100	23	59	15	3	100	7	39	37	17	100	38	48	8	6
Calhoun North-Schroeder 1 (2)*	2	0	50	50	0	2	0	50	50	0	2	0	100	0	0

* Special education class

Note: Response rates designate class mean percents.

(For detailed information, see Tables E14 in Appendix E.)

Table 22

Fixed Characteristics for Seventh-Grade Classes in District 4, by Teacher

School-Teacher *(N)*	**Sex *(%)***		**Language Preference *(%)**** *(self-identified)*		**Ethnicity *(%)*** ** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
—MiC—									
Kelvyn Park-Kane (14)	36	64	86	0	14	14	14	57	0
Kelvyn Park-Lux (13)	54	46	100	0	46	15	0	38	0
Kelvyn Park-Woodward (17)	59	41	100	0	18	24	0	59	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and (

(For detailed information, see Tables F1-F2 in Appendix F.)

Table 23

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 4, by Teacher

School-Teacher *(N)*	*(N)*	TerraNova - City CTB Mathematics Test National Percentile				
		Mean	**StDev**	**Min**	**Median**	**Max**
—MiC—						
Kelvyn Park-Kane (14)	14	57.79	17.74	20	57.5	83
Kelvyn Park-Lux (13)	13	45.00	13.49	18	46.0	64
Kelvyn Park-Woodward (17)	16	45.88	15.65	23	45.0	81

(For more detailed information, see Tables F3-F4 in Appendix F.)

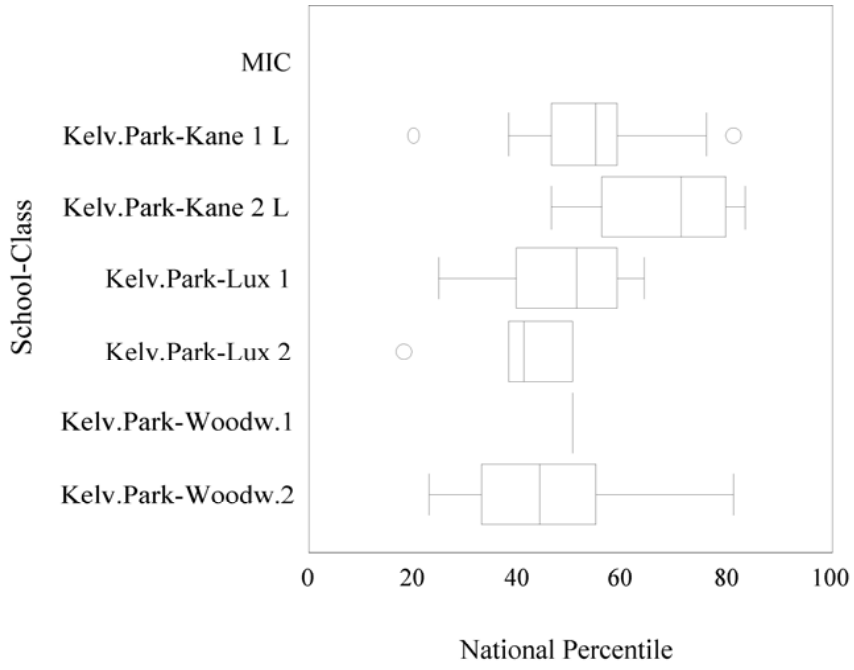

Figure 15. Box plots of class distributions on *TerraNova - City CTB Mathematics Test* , Grade 7, District 4.

Table 24

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 4, by Teacher

School-Teacher *(N)*	Level of Student Performance				
	(N)	Unistructural Average	Multistructural Average	Relational Average	Extended Abstract Average
—MiC—					
Kelvyn Park-Kane (14)	14	2.71	1.00	0.21	0.00
Kelvyn Park-Lux (13)	11	3.27	0.64	0.18	0.00
Kelvyn Park-Woodward (17)	15	2.13	0.53	0.00	0.00

(For detailed information, see Tables F5-F7 in Appendix F.)

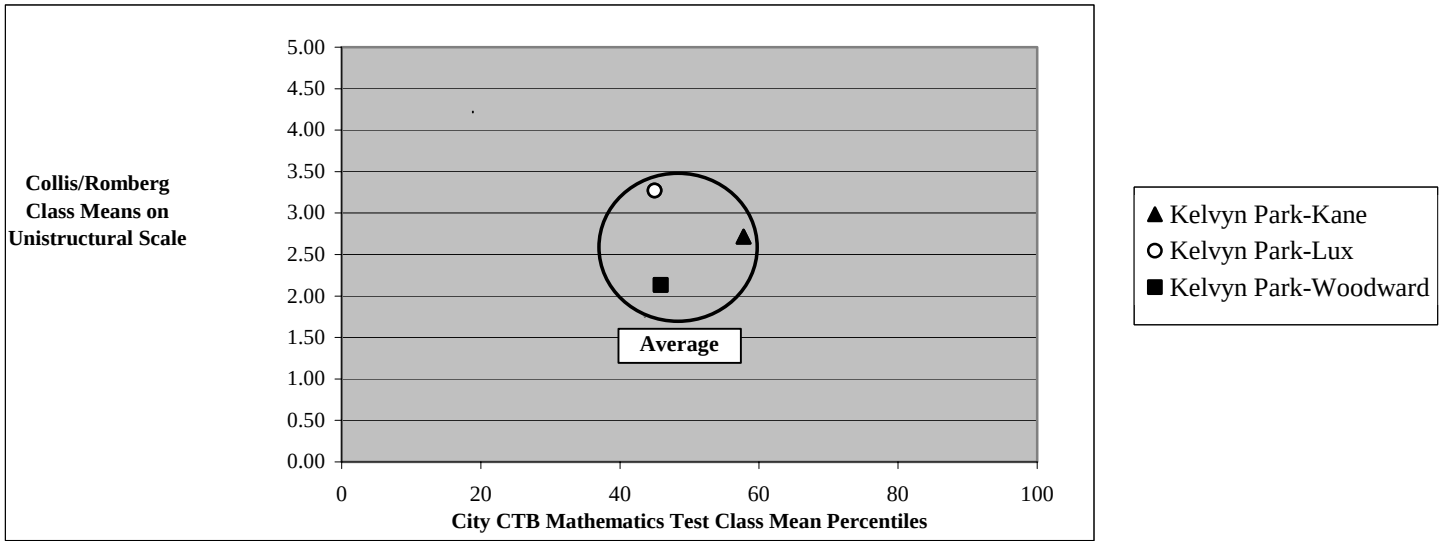

Figure 16. Scatter plot for class mean percentiles on *TerraNova - City CTB Mathematics Test* and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 7, District 4.

Table 25

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 4

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Kelvyn Park-Kane (14)	13	1.47	13	1.71	13	1.86	13	1.51	13	1.64
Kelvyn Park-Lux (13)	11	1.92	11	2.05	11	2.06	11	1.59	11	2.11
Kelvyn Park-Woodward (17)	15	1.73	15	2.12	15	1.86	15	1.83	15	2.02

(For detailed information, see Tables F8-F9 in Appendix F.)

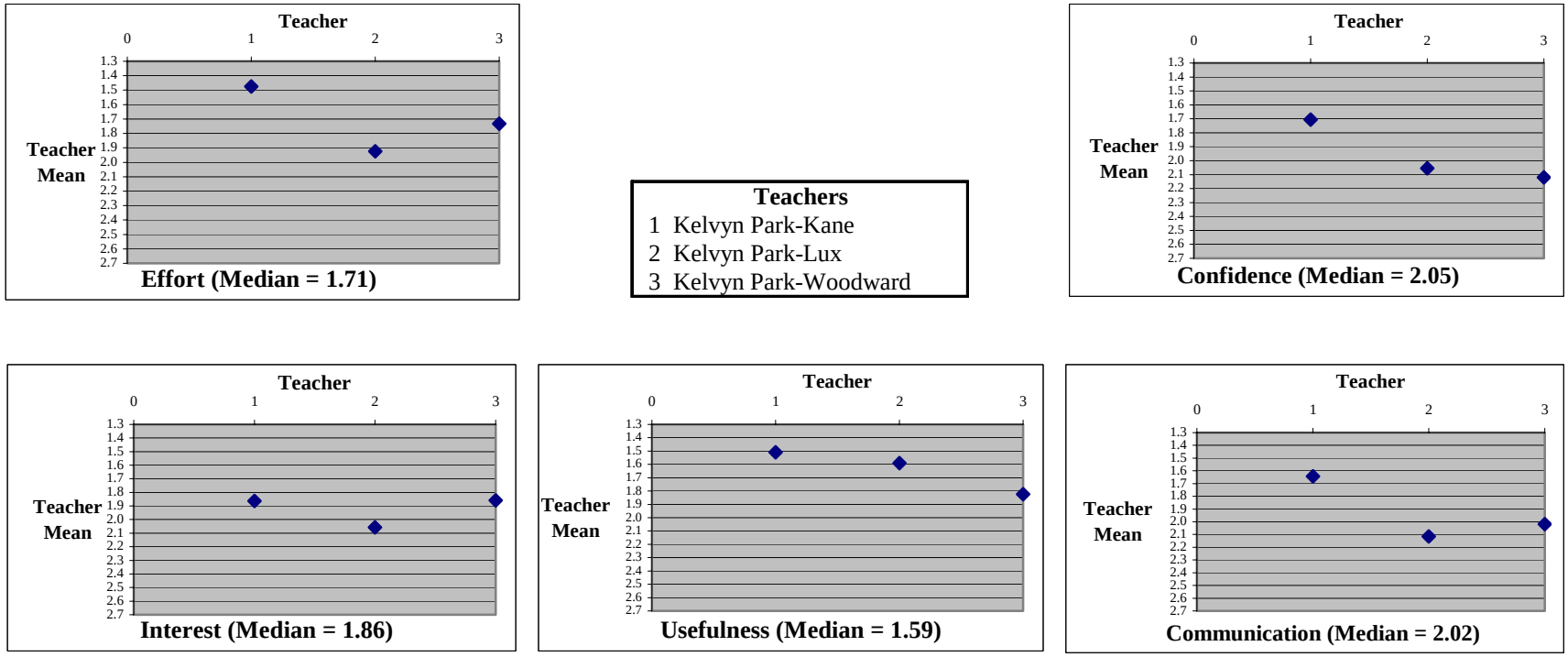

Figure 17. Plots showing class means on student judgments about mathematics, Grade 7, District 4.

Table 26

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 4

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Kelvyn Park-Kane (14)	13	3.77	13	2.85	13	1.35	13	3.65
Kelvyn Park-Lux (13)	11	4.00	11	2.91	11	1.36	11	3.55
Kelvyn Park-Woodward (17)	15	3.67	15	3.43	15	1.33	15	3.53

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Kelvyn Park-Kane (14)	13	3.48	13	3.23	13	2.11	13	3.65
Kelvyn Park-Lux (13)	11	3.82	11	2.73	11	2.18	11	3.73
Kelvyn Park-Woodward (17)	15	3.60	15	2.87	15	2.00	15	3.78

(For more detailed information, see Table F12 in Appendix F.)

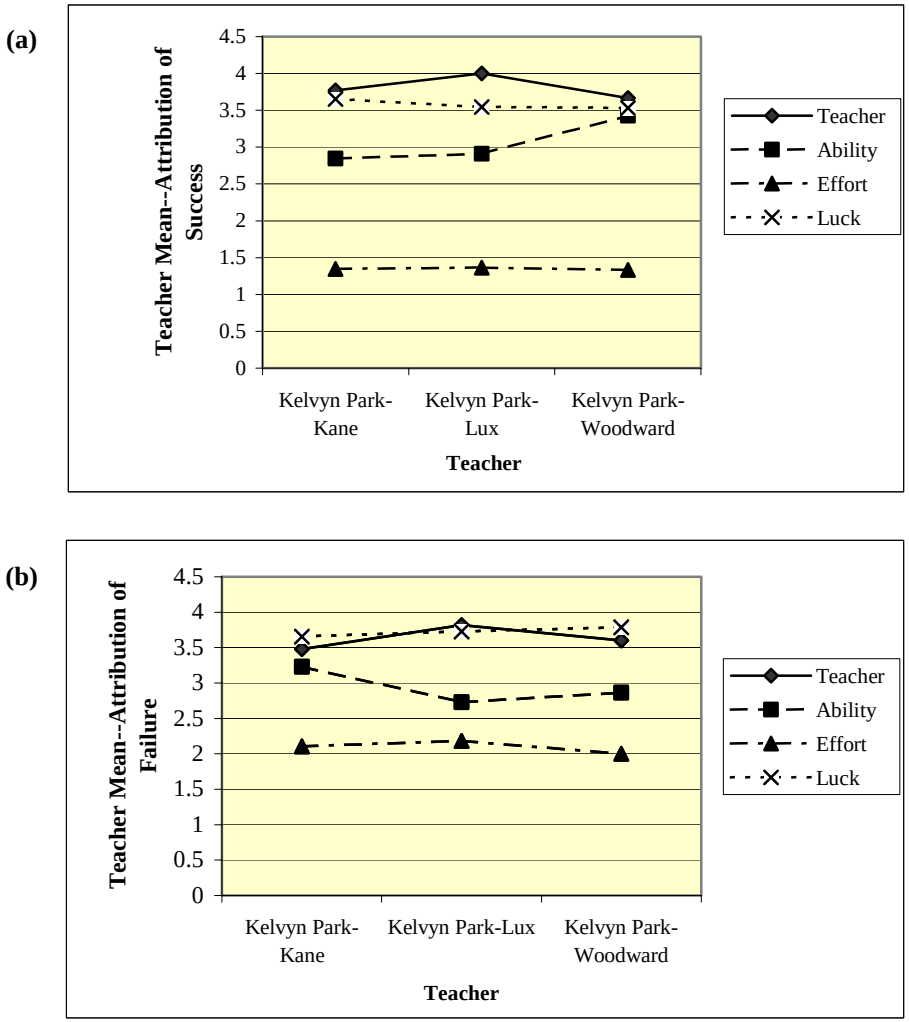

Figure 18. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 7, District 4.

Table 27

Student Preference Ranking of Classes in District 4, Grade 7

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—						
Kelvyn Park-Kane (14)	15	8	38	15	0	8	0	15	0	0
Kelvyn Park-Lux (13)	17	0	8	8	8	8	0	42	0	8
Kelvyn Park-Woodward (17)	7	14	43	0	0	7	7	21	0	0

[1] Other includes mutiple preferences.

Note: Response rates designate class mean percents.

(For detailed information, see Tables F13 in Appendix F.)

Table 28

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 4, by Teacher

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— *MiC* —									
Kelvyn Park-Kane (14)	13	38	46	17	0	13	0	46	31	23	13	0	23	4	6
Kelvyn Park-Lux (13)	12	8	83	8	0	12	17	17	58	8	12	17	25	33	25
Kelvyn Park-Woodward (17)	14	7	57	14	21	14	14	29	36	21	14	7	36	43	14

Note: Response rates designate class mean percents.

(For detailed information, see Tables F14 in Appendix F.)

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Longitudinal/Cross-Sectional Study of the Impact of *Mathematics in Context* on Student Performance

Student Background Data for 1999–2000 (Grade 8)

(Technical Report #20b)

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University of Wisconsin–Madison

March 2002

Romberg, T. A., Folgert, L., Shafer, M. C., & Arauco, T. (2002). *Student Background Data for 1999-2000 (Grade 8)*. (*Mathematics in Context* Longitudinal/Cross-Sectional Study Technical Report No. 20b). Madison, WI: University of Wisconsin–Madison.

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INTRODUCTION

The purposes of the longitudinal/cross-sectional study of the impact of *Mathematics in Context* (MiC; National Center for Research in Mathematical Sciences Education & Freudenthal Institute, 1997–1998) on student performance are (a) to determine the mathematical knowledge, understanding, attitudes, and levels of student performance as a consequence of studying MiC for over three years; and (b) to compare student knowledge, understanding, attitudes, and levels of performance of students using MiC with those using conventional mathematics curricula. The research model for this study is an adaptation of a structural model for monitoring changes in school mathematics (Romberg, 1987). For this study, information is being gathered on 14 variables over a 3-year period for three groups of students (those in Grades 7 and 8 in 1999). The variables have been organized in five categories (prior, independent, intervening, outcome, and consequent). (See Figure 1 for variables and hypothesized relationships.)

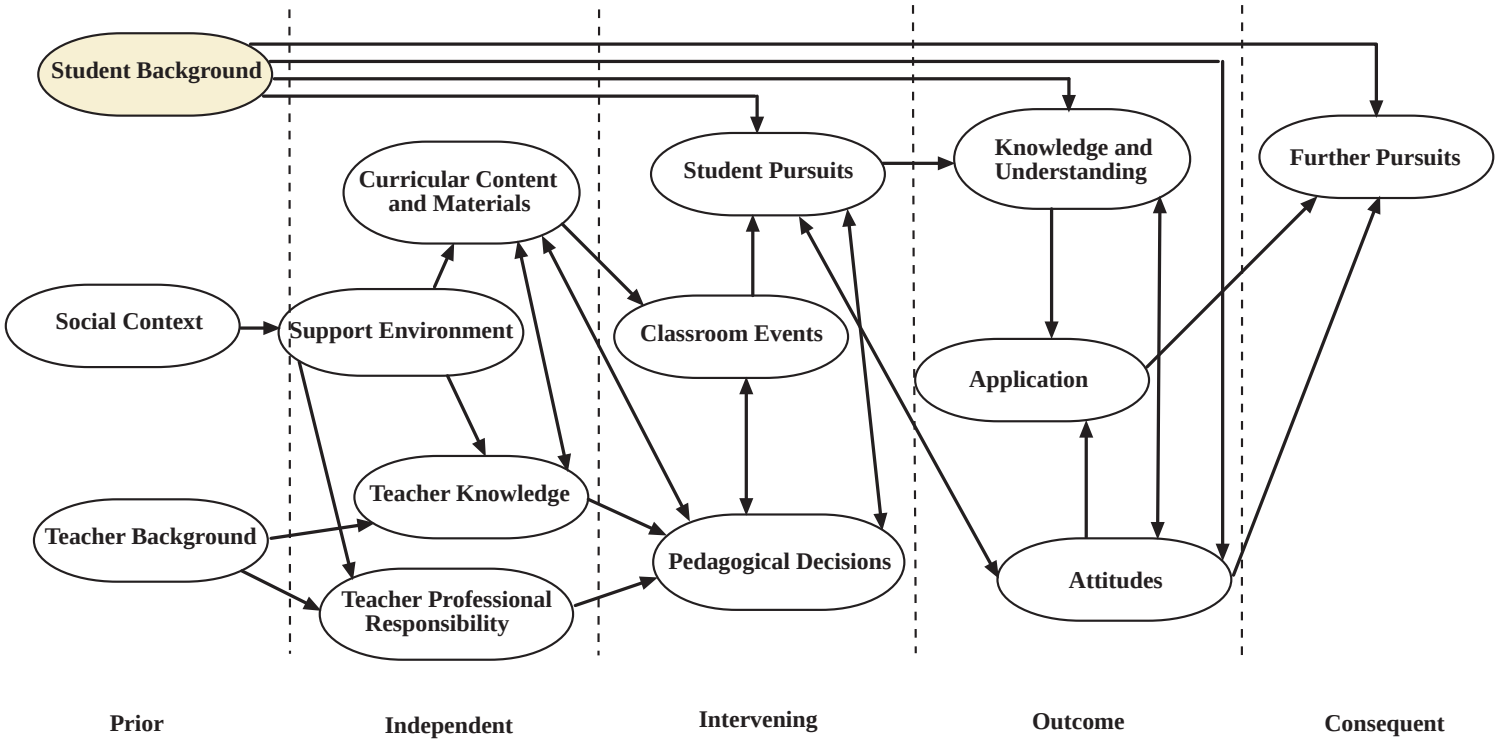


Figure 1. Revised structural model, with variables and hypothesized relationships, for the monitoring of change in school mathematics.

The purpose of this technical paper is to summarize the information of the *Student Background* variable collected in 1999 on eighth-grade classes at the beginning of the longitudinal/cross-sectional study of the impact of *Mathematics in Context* on student performance. The purpose of gathering this information was to describe similarities and differences in six class characteristics prior to instruction (see Figure 2). Three fixed characteristics for the students in each class—gender, preferred language, and ethnicity—were gathered via a Student Questionnaire (see Appendix A; Shafer, 1997). Three other class characteristics—measures of student mathematical knowledge, student mathematical applications, and disposition toward mathematics—were taken, respectively, from standardized test scores provided by the schools, scores on the project-administered *Collis-Romberg Mathematical Problem-Solving Profiles* (Collis & Romberg, 1992), and student responses to the Student Questionnaire and Student Attitude Inventory (see Appendix B; Shafer, Wagner, & Davis, 1997).

Students of 14 eighth-grade teachers from four school districts participated in the study. Districts are identified by number, and the students by school and teacher (both pseudonyms). Also noted are the type of materials used (MiC materials or a conventional text).

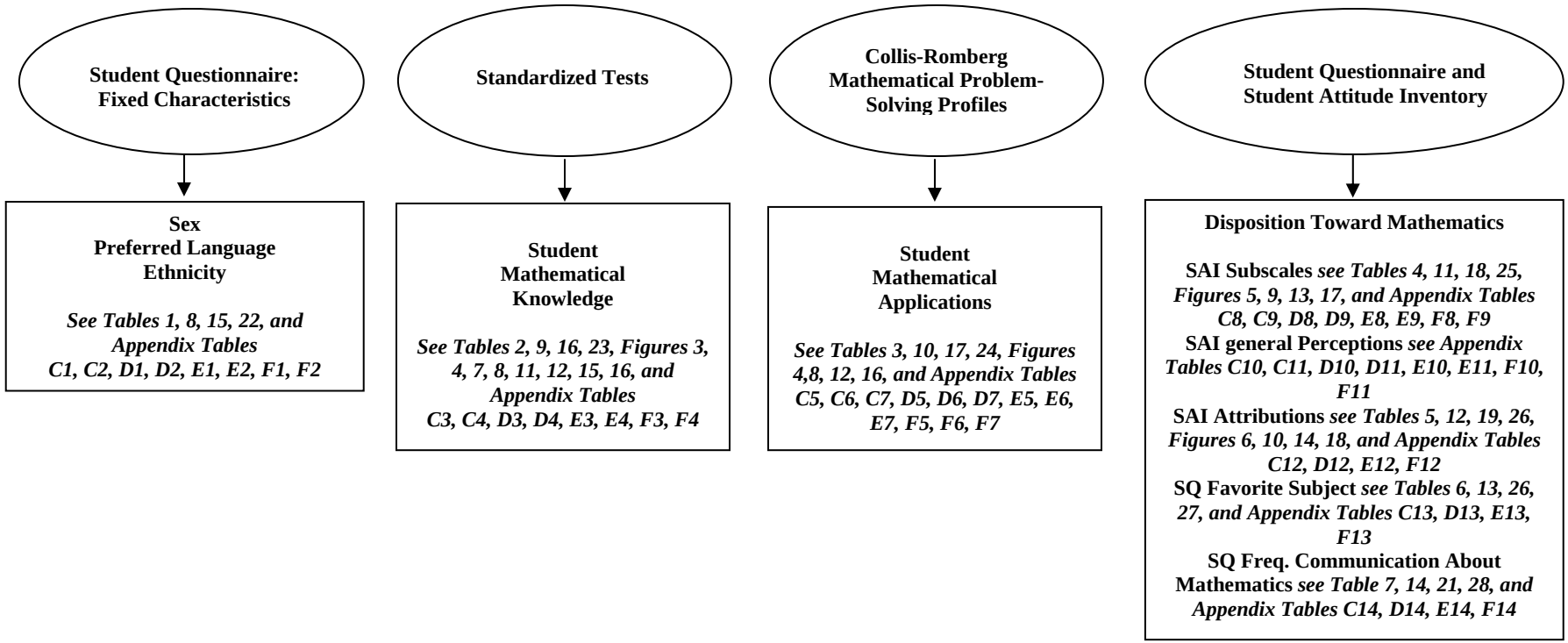


Figure 2. Fixed class characteristics in longitudinal/cross-sectional study of the impact of *Mathematics in Context* on student performance and their sources.

Table 1

Fixed Characteristics for Eighth-Grade Classes in District 1, by Teacher

School-Teacher *(N)*	Sex *(%)*		Language Preference *(%)** *(self-identified)*		Ethnicity (*%*) ** *(self-identified)*				
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Multi-Other	Non-Response
—MiC—									
Fernwood-Dunn (26)	42	58	92	0	4	15	50	27	4
Von Humboldt-Reichers (60)	62	38	90	8	27	0	62	10	2
Von Humboldt-Waters (43)	56	44	88	5	28	0	47	16	9
—Conventional—									
Addams-Wolfe (50)	58	42	100	0	4	2	86	8	0
Fernwood-Pimm (5)	20	80	80	0	20	20	60	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial a

(For detailed information, see Tables C1-C2 in Appendix C.)

Table 2

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 1, by Teacher

School-Teacher ***(N)***	***(N)***	**TerraNova National Percentile**				
		Mean	**StDev**	**Min**	**Median**	**Max**
		—MiC—				
Fernwood-Dunn (26)	14	22.29	15.11	3	22.5	52
Von Humboldt-Reichers (60)	47	37.98	25.45	4	29.0	98
Von Humboldt-Waters (43)	34	39.06	25.17	7	35.0	96
		—Conventional—				
Addams-Wolfe (50)	41	69.66	22.06	13	74.0	99
Fernwood-Pimm (5)	3	50.00	23.52	27	49.0	74

(For detailed information, see Tables C3-C4 in Appendix C.)

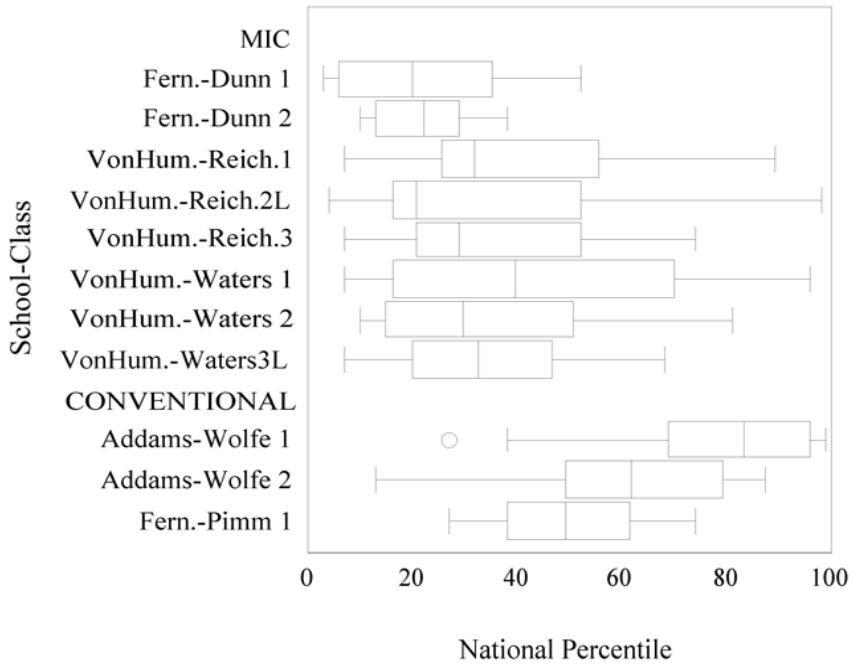


Figure 3. Box plots of class distributions on the *TerraNova* test, Grade 8, District 1

Table 3

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 1, by Teacher

School-Teacher *(N)*	**Level of Student Performance**				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Fernwood-Dunn (26)	20	3.40	1.30	0.35	0.05
Von Humboldt-Reichers (60)	39	3.21	1.36	0.46	0.00
Von Humboldt-Waters (43)	26	2.92	1.04	0.15	0.00
			—Conventional—		
Addams-Wolfe (50)	46	3.80	2.37	1.07	0.11
Fernwood-Pimm (5)	3	3.00	1.00	0.33	0.33

(For detailed information, see Tables C5-C7 in Appendix C.)

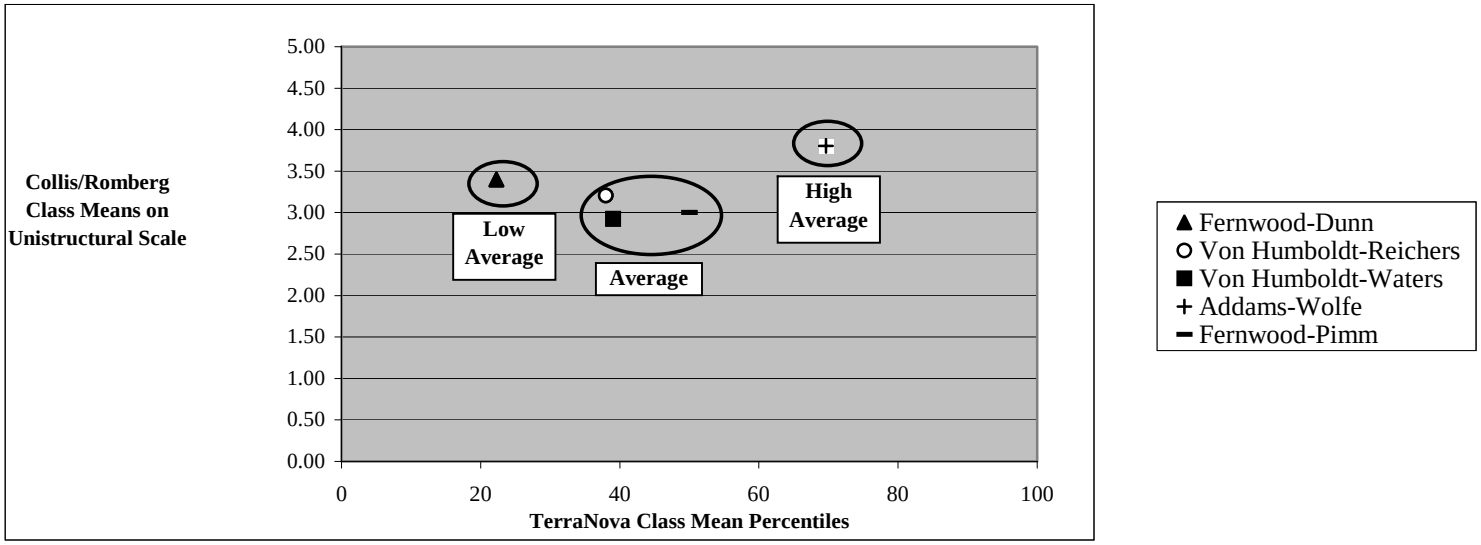


Figure 4. Scatter plot for class mean percentiles on the *TerraNova* test and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 8, District 1.

Table 4

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 1

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Fernwood-Dunn (26)	26	2.01	26	2.03	26	2.07	26	1.73	26	1.92
Von Humboldt-Reichers (60)	54	2.31	54	2.14	54	2.66	54	1.96	54	2.23
Von Humboldt-Waters (43)	34	2.25	34	2.16	34	2.64	34	1.97	34	2.25
–Conventional–										
Addams-Wolfe (50)	48	2.11	48	1.98	48	2.26	48	1.69	48	1.98
Fernwood-Pimm (5)	5	2.00	5	2.20	5	2.15	5	1.95	5	2.14

(For detailed information, see Tables C8-C9 in Appendix C.)

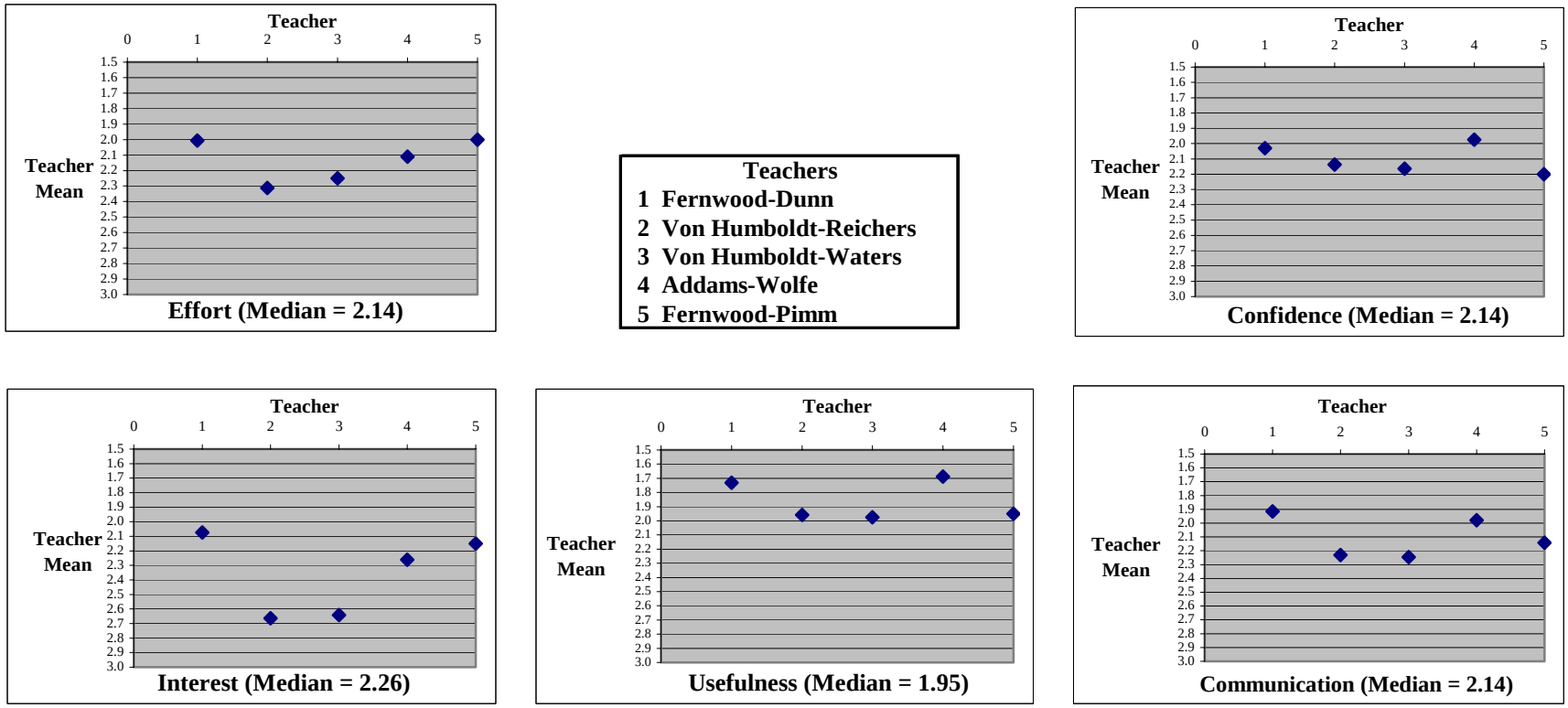


Figure 5. Plots showing class means on student judgments about mathematics, Grade 8, District 1.

Table 5

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 1

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Fernwood-Dunn (26)	26	3.92	26	2.68	26	1.35	26	3.15
Von Humboldt-Reichers (60)	54	3.78	54	2.94	54	1.53	54	3.05
Von Humboldt-Waters (43)	34	3.71	34	2.59	34	1.53	34	3.09
–Conventional–								
Addams-Wolfe (50)	48	3.73	48	2.69	48	1.27	48	3.29
Fernwood-Pimm 1 period 6 (5) S	5	3.40	5	2.20	5	1.40	5	3.20

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Fernwood-Dunn (26)	26	3.69	26	2.88	26	2.15	26	3.19
Von Humboldt-Reichers (60)	54	3.47	54	2.82	54	1.83	54	3.45
Von Humboldt-Waters (43)	34	3.65	34	2.82	34	2.21	34	3.36
–Conventional–								
Addams-Wolfe (50)	48	3.69	48	3.13	48	1.67	48	3.58
Fernwood-Pimm 1 period (5)	5	3.20	5	2.80	5	2.40	5	3.60

(For more detailed information, see Table C12 in Appendix C.)

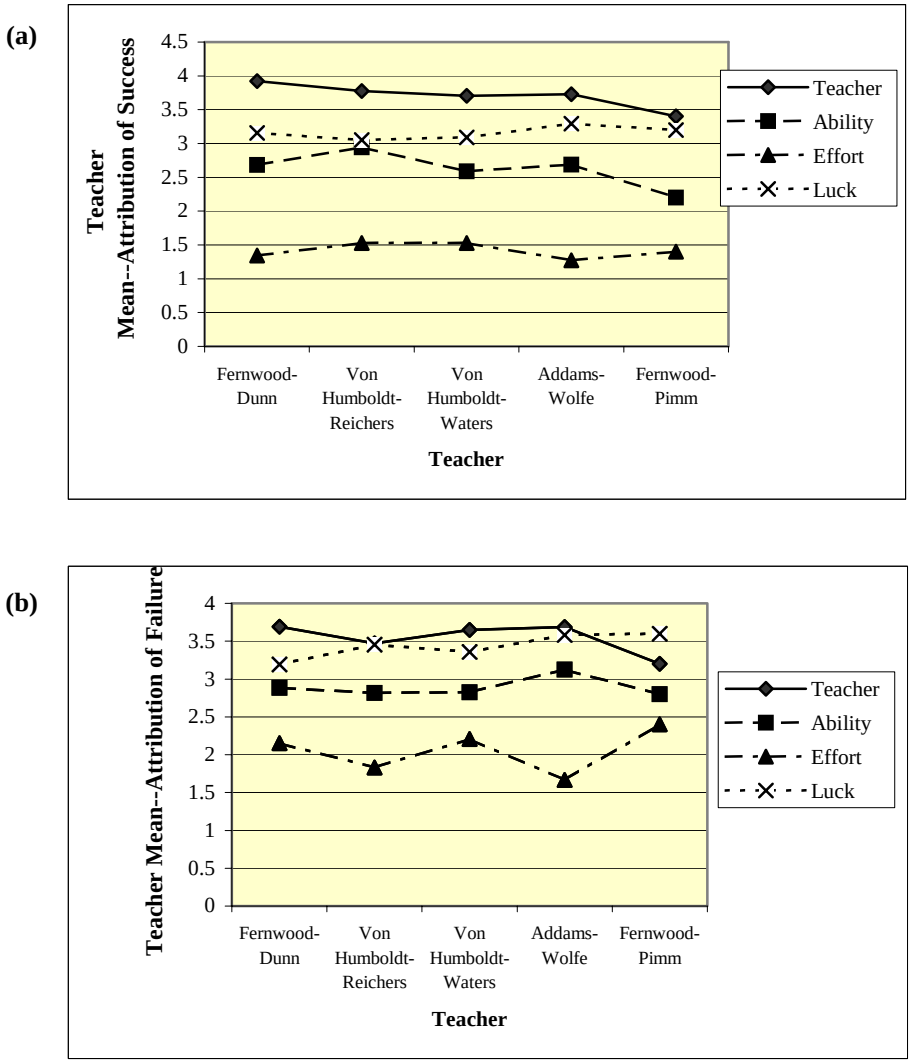


Figure 6. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 8, District 1

Table 6

Student Preference Ranking of Classes in District 1, Grade 8

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				–MiC–						
Fernwood-Dunn (26)	0	12	16	0	0	12	8	52	0	0
Von Humboldt-Reichers (60)	25	4	7	2	5	4	5	12	9	28
Von Humboldt-Waters (43)	25	7	7	0	0	4	4	25	14	14
				—Conventional—						
Addams-Wolfe (50)	0	19	15	0	2	13	10	4	0	38
Fernwood-Pimm (5)	0	20	0	0	0	0	0	80	0	0

[1] Other includes mutiple preferences.

[2] Preference data were unavailable.

Note: Response rates designate class mean percents.

(For detailed information, see Tables C13 in Appendix C.)

Table 7

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 1

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— MiC —															
Fernwood-Dunn (26)	25	12	68	16	4	25	12	36	48	4	25	28	36	24	12
Von Humboldt-Reichers (60)	54	26	52	19	4	54	7	41	43	9	54	39	43	11	7
Von Humboldt-Waters (43)	28	29	46	18	7	28	11	46	32	11	28	32	43	11	14
—Conventional —															
Addams-Wolfe (50)	48	29	54	8	8	48	8	38	31	23	48	40	38	13	10
Fernwood-Pimm (5)	5	0	80	20	0	5	0	60	0	40	5	0	20	60	20

Note: Response rates designate class mean percents.
(For detailed information, see Tables C14 in Appendix C.)

Table 8

Fixed Characteristics for Eighth-Grade Classes in District 2, by Teacher

School-Teacher ***(N)***	**Sex** ***(%)***		**Language Preference** ***(%)**** *(self-identified)*		**Ethnicity (%) **** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
—MiC—									
Guggenheim-Carlson (57)	35	65	88	5	30	33	23	12	2
Guggenheim-Dillard (20)	50	50	100	0	0	25	25	50	0
Weir-Gallardo (23)	57	43	61	26	57	30	0	13	0
Weir-Shepard (19)	53	47	79	11	63	11	0	26	0
—Conventional—									
(none)									

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multira

(For detailed information, see Tables D1-D2 in Appendix D.)

Table 9

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 2, by Teacher

School-Teacher ***(N)***	**SAT National Percentile**					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
			—MiC—			
Guggenheim-Carlson (57)	50	33.78	23.49	1	29.0	85
Guggenheim-Dillard (20)	18	47.56	27.46	3	54.5	94
Weir-Gallardo (23)	22	49.41	29.49	3	49.0	91
Weir-Shepard (19)	18	27.50	20.22	3	24.5	69
			—Conventional—			
(none)						

(For more detailed information, see Tables D3-D4 in Appendix D.)

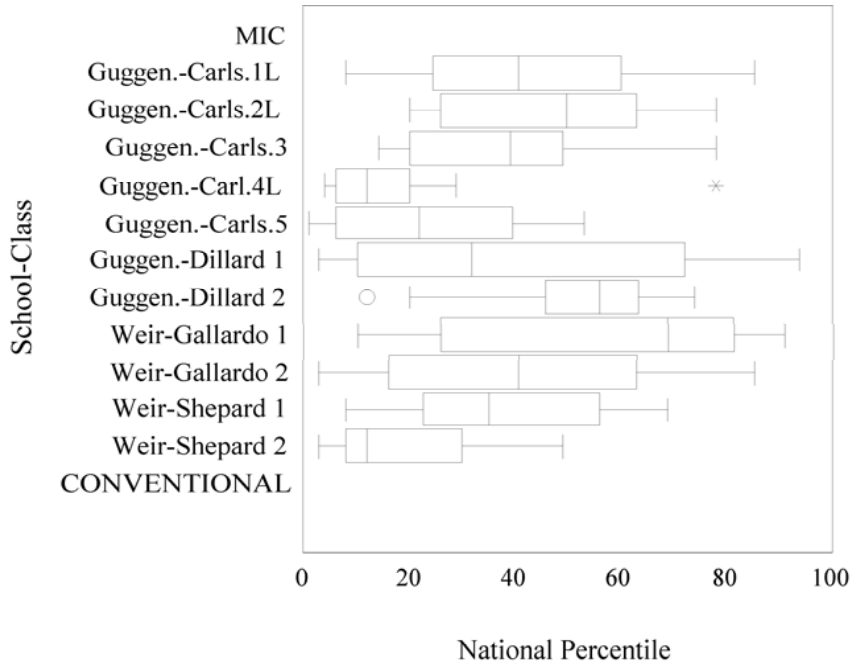


Figure 7. Box plots of class distributions on the *SAT*, Grade 8, District 2

Table 10

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 2, by Teacher

School-Teacher *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
—MiC—					
Guggenheim-Carlson (57)	46	2.61	0.91	0.22	0.00
Guggenheim-Dillard (20)	16	3.13	1.50	0.31	0.00
Weir-Gallardo (23)	10	2.40	1.00	0.30	0.00
Weir-Shepard (19)	5	1.80	0.40	0.00	0.00
—Conventional—					
(none)					

(For detailed information, see Tables D5-D7 in Appendix D.)

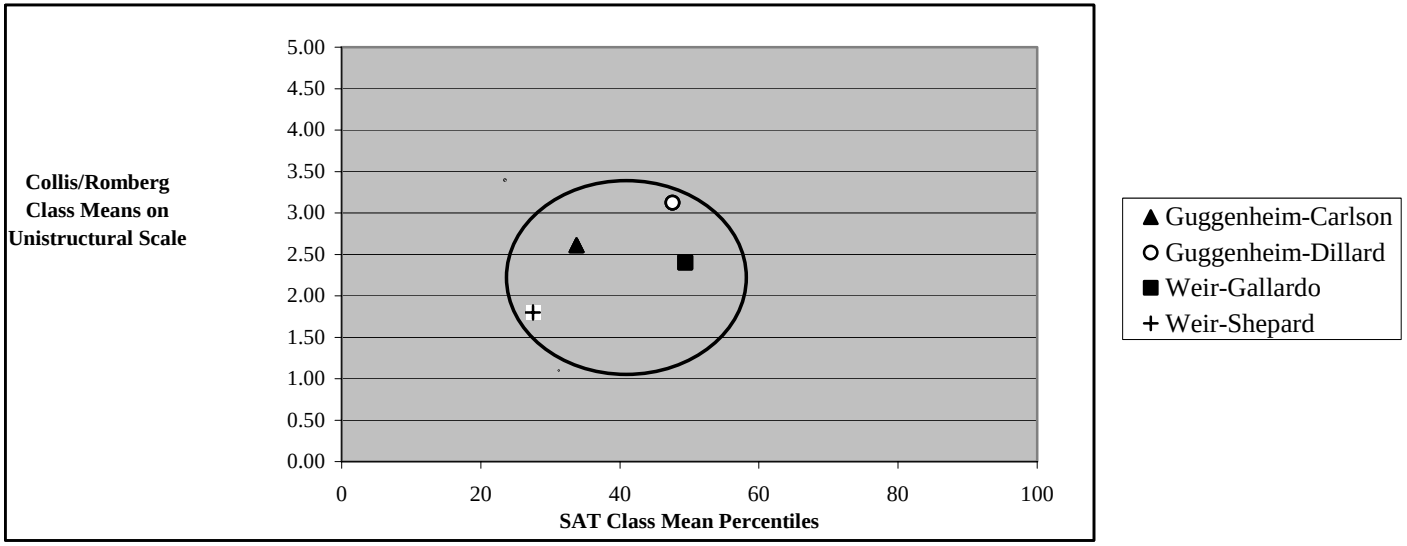


Figure 8. Scatter plot for class mean percentiles on the *SAT* and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 8, District 2

Table 11

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 2

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Guggenheim-Carlson (57)	52	2.15	52	2.20	52	2.26	52	1.82	52	2.04
Guggenheim-Dillard (20)	16	1.98	16	2.05	16	2.08	16	1.61	16	1.91
Weir-Gallardo (23)	21	1.96	21	2.00	21	2.25	21	1.89	21	2.03
Weir-Shepard (19)	15	1.77	15	1.93	15	2.10	15	1.67	15	1.98
–Conventional–										
(none)										

(For detailed information, see Tables D8-D9 in Appendix D.)

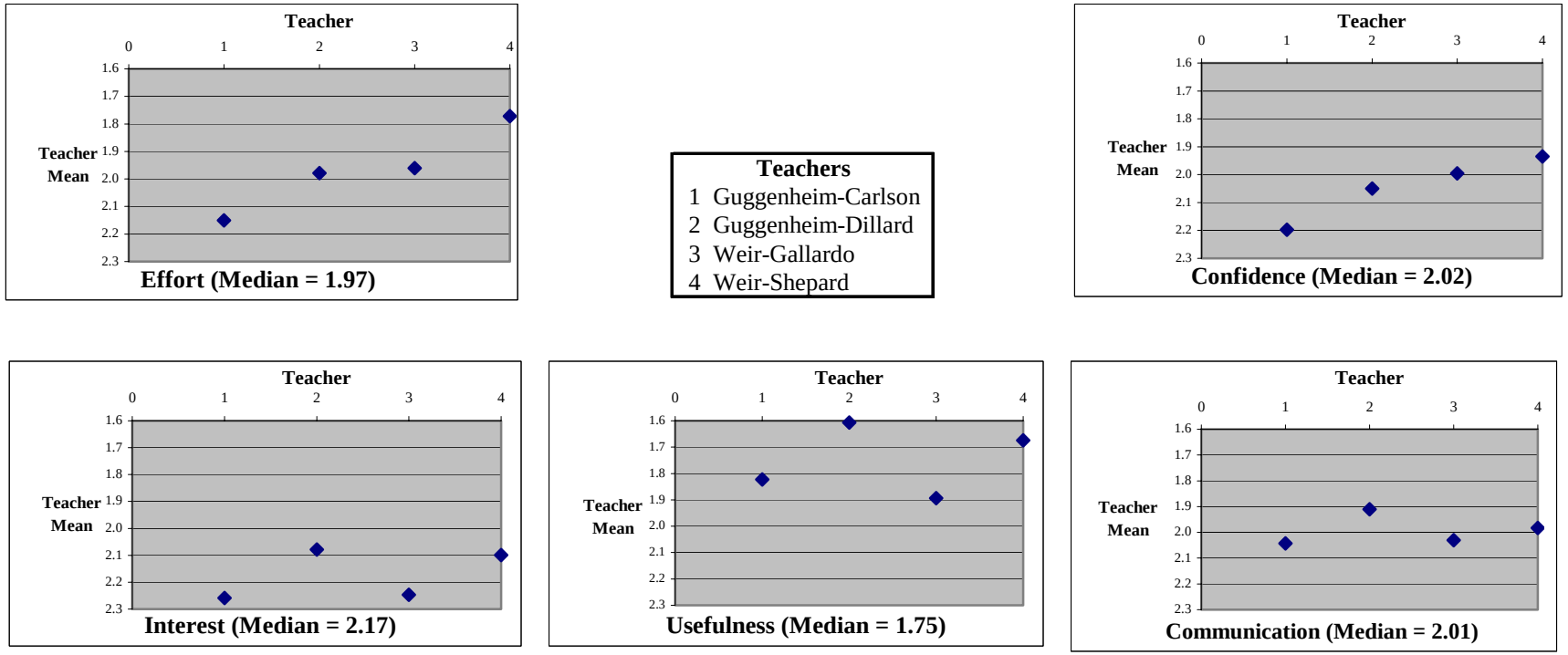


Figure 9. Plots showing class means on student judgments about mathematics, Grade 8, District 2

Table 12

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Guggenheim-Carlson (57)	52	3.33	52	2.35	52	1.54	52	3.15
Guggenheim-Dillard (20)	16	3.94	16	2.38	16	1.56	16	3.44
Weir-Gallardo (23)	21	3.71	21	2.33	21	1.68	21	3.30
Weir-Shepard (19)	15	3.67	15	2.61	15	1.14	15	3.80

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Guggenheim-Carlson (57)	52	3.48	52	2.75	52	1.76	52	3.25
Guggenheim-Dillard (20)	16	3.38	16	2.63	16	2.19	16	3.63
Weir-Gallardo (23)	21	3.65	21	3.26	21	1.95	21	3.63
Weir-Shepard (19)	15	3.51	15	2.87	15	1.61	15	3.58

(For more detailed information, see Table D12 in Appendix D.)

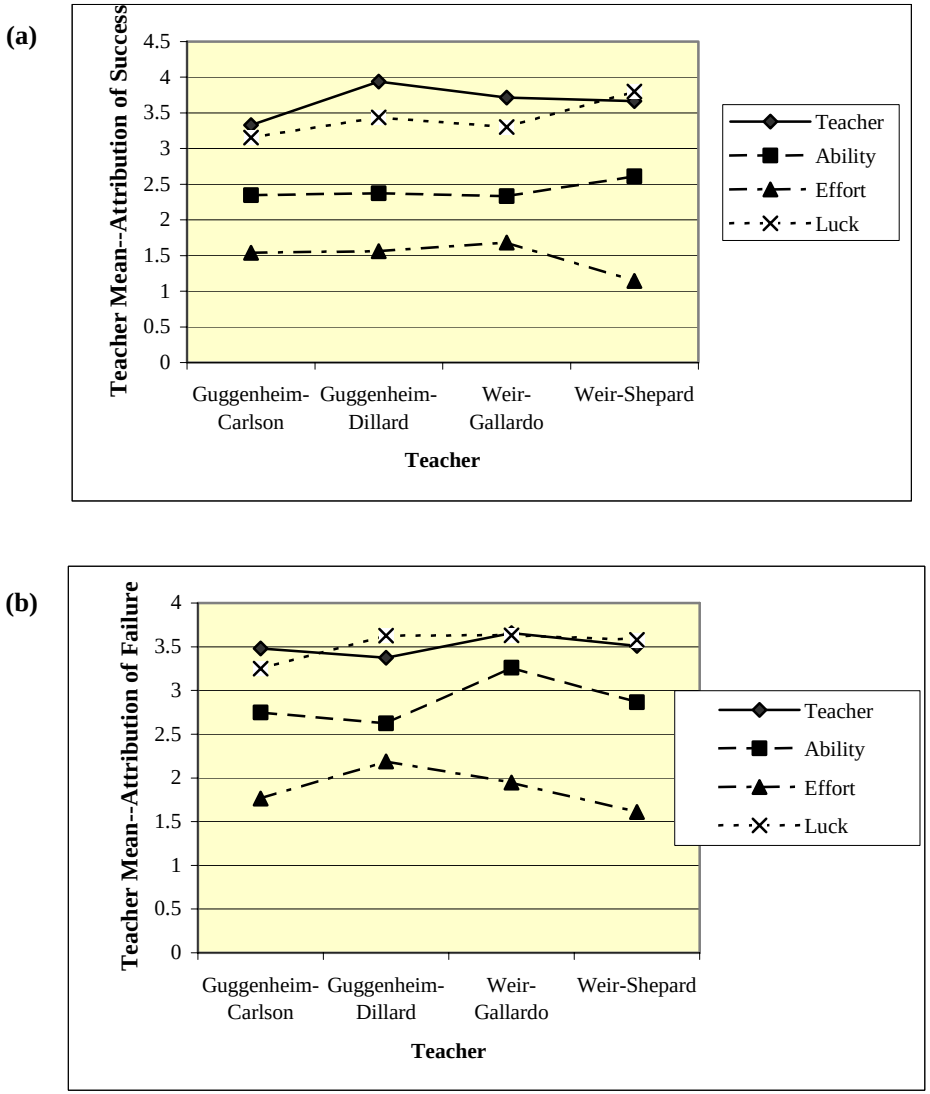


Figure 10. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 8, District 2

Table 13

Student Preference Ranking of Classes in District 2, Grade 8

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—					
Guggenheim-Carlson (57)	13	17	15	4	0	4	0	13	7	26
Guggenheim-Dillard (20)	11	16	11	11	11	11	5	5	5	16
Weir-Gallardo (23)	15	15	15	0	8	8	0	8	8	23
Weir-Shepard (19)	7	27	7	0	13	20	0	7	7	13

[1] Other includes mutiple preferences.

[2] Preference data were unavailable.

Note: Response rates designate class mean percents.

(For detailed information, see Tables D13 in Appendix D.)

Table 14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 2

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— MiC —									
Guggenheim-Carlson (57)	45	8	53	29	13	45	7	40	44	9	45	24	33	24	18
Guggenheim-Dillard (20)	19	21	37	37	5	19	5	42	32	21	19	26	37	26	11
Weir-Gallardo (23)	13	15	54	15	15	13	0	31	38	31	13	46	31	15	8
Weir-Shepard (19)	14	7	43	36	14	15	20	33	20	27	15	53	13	13	20
						—Conventional —									
(none)															

Note: Response rates designate class mean percents.

(For detailed information, see Tables D14 in Appendix D.)

Table 15

Fixed Characteristics for Eighth-Grade Classes in District 3, by Teacher

School-Teacher ***(N)***	**Sex** ***(%)***		**Language Preference** ***(%)**** *(self-identified)*		**Ethnicity (%) **** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
—MiC—									
Calhoun North-Wells (49)	45	55	96	0	0	2	94	2	2
Calhoun North-Schroeder 2 (7)***	43	57	100	0	0	0	71	29	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** Special education classroom.

(For detailed information, see Tables E1-E2 in Appendix E.)

Table 16

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 3, by Teacher

School-Teacher *(N)*	SAT-9					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
			—MiC—			
Calhoun North-Wells (49)	45	39.62	16.95	6	40.0	77
Calhoun North-Schroeder (7)*	5	18.14	15.86	7	11.0	52

*Special education class

(For more detailed information, see Tables E3-E4 in Appendix E.)

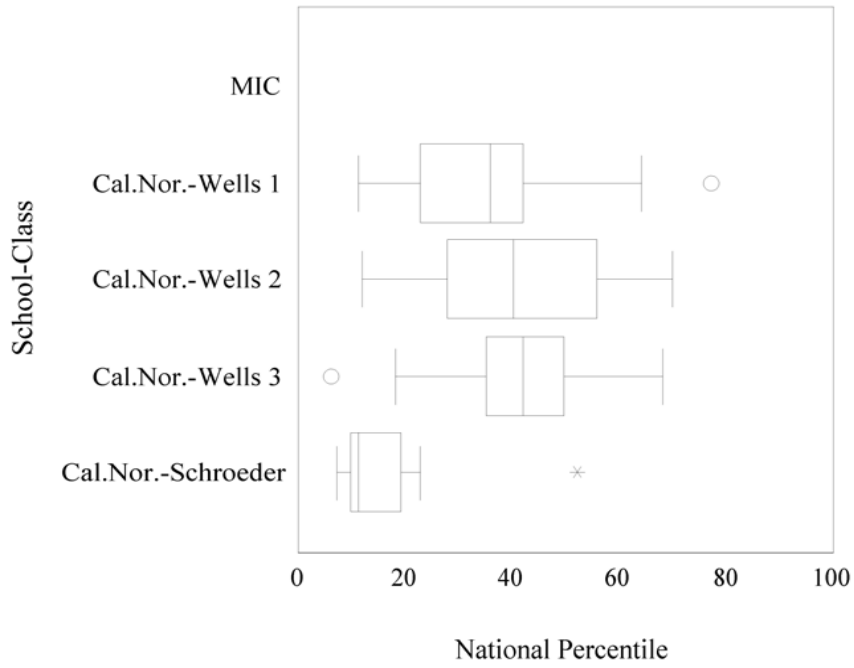


Figure 11. Box plots of class distributions on the *SAT-9* , Grade 8, District 3

Table 17

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 3, by Teache

School-Teacher *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Calhoun North-Wells (49)	44	2.80	1.32	0.18	0.02
Calhoun North-Schroeder (7)*	7	2.00	0.57	0.00	0.00

*Special education class

(For detailed information, see Tables E5-E7 in Appendix E.)

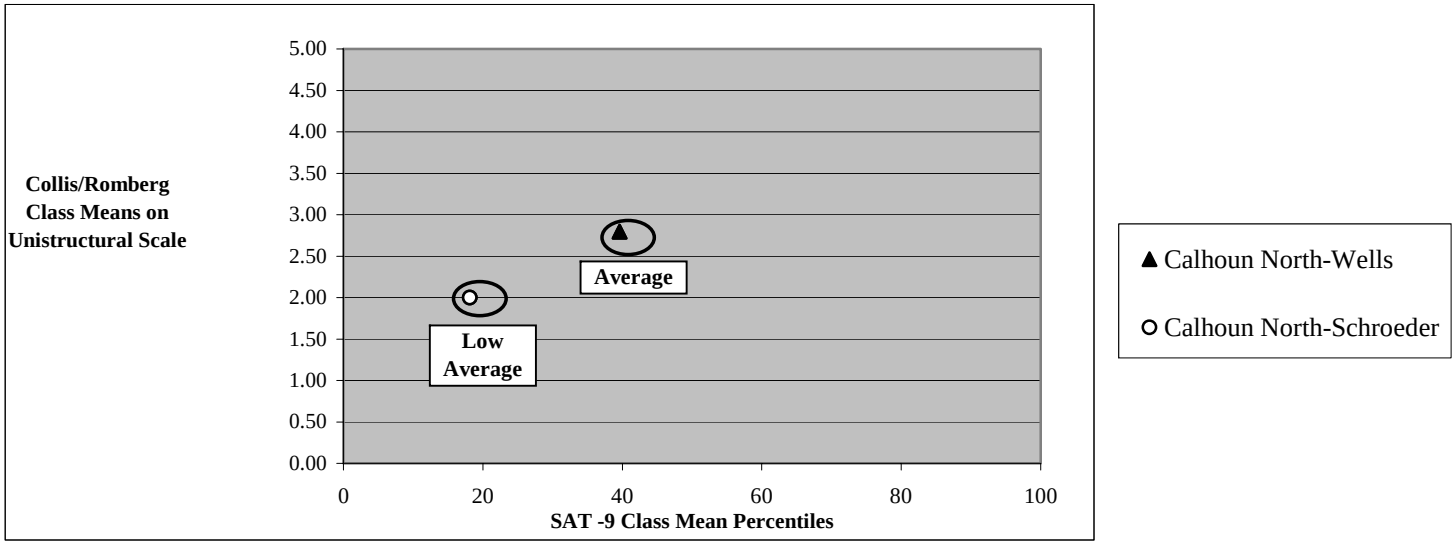


Figure 12. Scatter plot for class mean percentiles on the *SAT* and the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 8, District 3

Table 18

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory, by Teacher, in District 3

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
					–MiC–					
Calhoun North-Wells (49)	40	2.43	40	2.38	40	2.85	40	2.12	40	2.30
Calhoun North-Schroeder (7)*	7	1.88	7	1.97	7	2.03	7	1.79	7	1.55

* Special education class

(For detailed information, see Tables E8-E9 in Appendix E.)

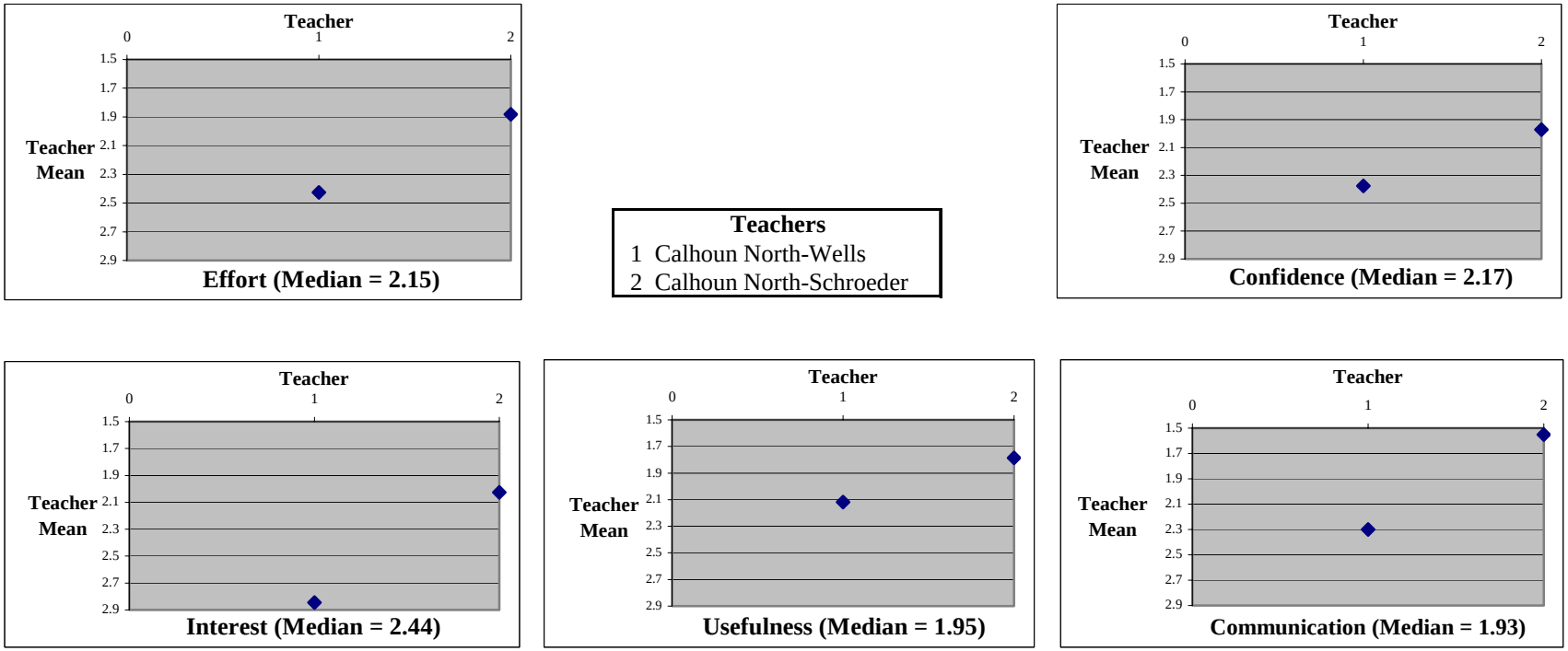


Figure 13. Plots showing class means on student judgments about mathematics, Grade 8, District 3.

Table 19

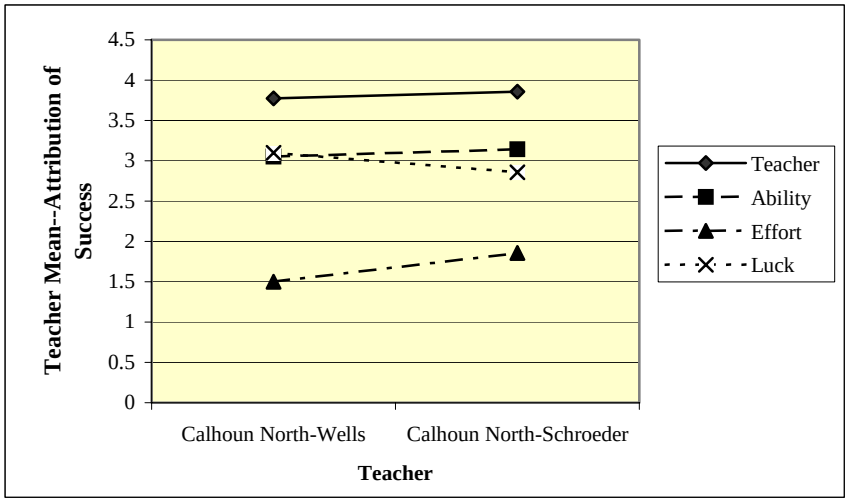
Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 3

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Calhoun North-Wells (49)	40	3.78	40	3.05	40	1.50	40	3.10
Calhoun North-Schroeder (7)	7	3.86	7	3.14	7	1.86	7	2.86

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Calhoun North-Wells (49)	40	3.51	40	2.78	40	2.38	40	3.48
Calhoun North-Schroeder (7)	7	3.57	7	2.71	7	1.14	7	3.14

(For more detailed information, see Table E12 in Appendix E.)

(a)



(b)

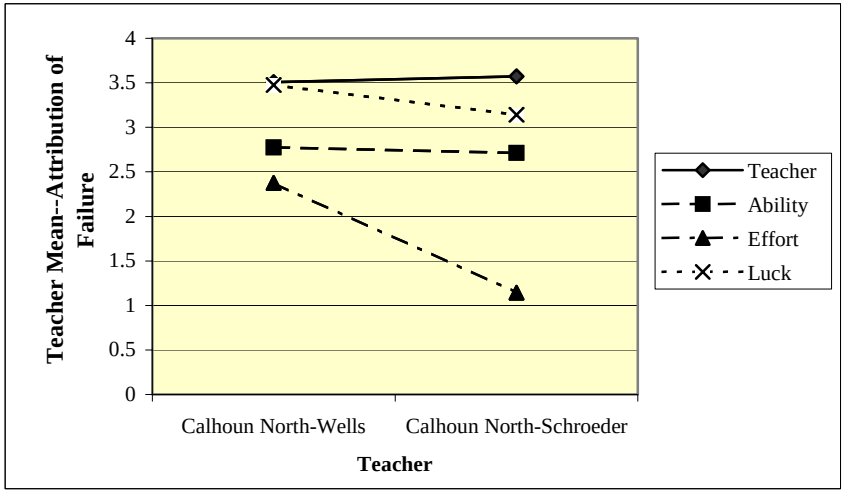


Figure 14. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 8, District 3

Table 20

Student Preference Ranking of Classes in District 3, Grade 8

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—					
Calhoun North-Wells (49)	--	--	--	--	--	--	--	--	--	--
Calhoun North-Schroeder (7)[3]	0	14	0	0	0	29	0	0	0	57

[1] Other includes mutiple preferences.

[2] Preference data was not available.

[3] Special education class

Note: Response rates designate class mean percents.

(For detailed information, see Tables E13 in Appendix E.)

Table 21

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 3

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— *MiC* —									
Calhoun North-Wells (49)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Calhoun North-Schroeder 2 (7)*	7	0	100	0	0	7	0	57	29	14	7	29	71	1	0

*Special education class

Note: Response rates designate class mean percents.

(For detailed information, see Tables E14 in Appendix E.)

Table 22

Fixed Characteristics for Eighth-Grade Classes in District 4, by Teacher

School-Teacher ***(N)***	**Sex** ***(%)***		**Language Preference** ***(%)**** *(self-identified)*		**Ethnicity (%) **** *(self-identified)*				
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Multi-Other**	**Non-Response**
MiC									
Kelvyn Park-Downer (21)	33	67	95	0	29	14	5	52	0
Kelvyn Park-Novak (38)	61	39	82	11	37	21	3	26	13
Kelvyn Park-Woods (20)	75	25	80	0	15	55	0	25	5

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

(For detailed information, see Tables F1-F2 in Appendix F.)

Table 23

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 4, by Teacher

School-Teacher *(N)*	*(N)*	TerraNova - City CTB Mathematics Test National Percentile				
		Mean	StDev	Min	Median	Max
		—MiC—				
Kelvyn Park-Downer (21)	20	47.30	19.68	9	50.5	78
Kelvyn Park-Novak (38)	28	54.50	25.22	22	60.0	91
Kelvyn Park-Woods (20)	18	53.78	18.83	14	56.0	88

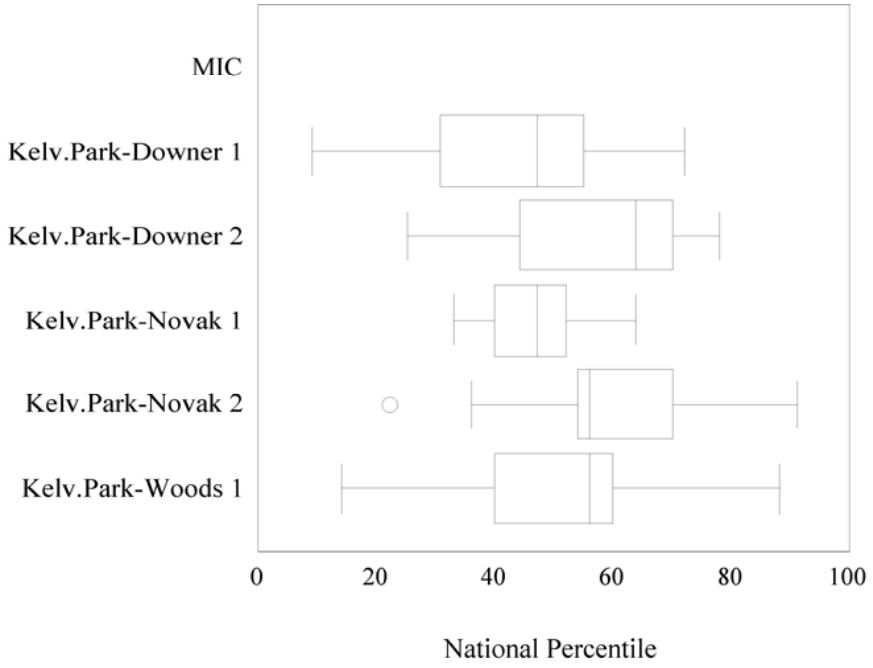


Figure 15. Box plots of class distributions on the *TerraNova* -City CTB Mathematics Test, Grade 8, District 4

Table 24

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 4, by Teache

School-Teacher *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Kelvyn Park-Downer (21)	11	2.82	0.73	0.09	0.00
Kelvyn Park-Novak (38)	18	3.33	1.50	0.39	0.06
Kelvyn Park-Woods (20)	9	3.22	1.33	0.22	0.00

(For detailed information, see Tables F5-F7 in Appendix F.)

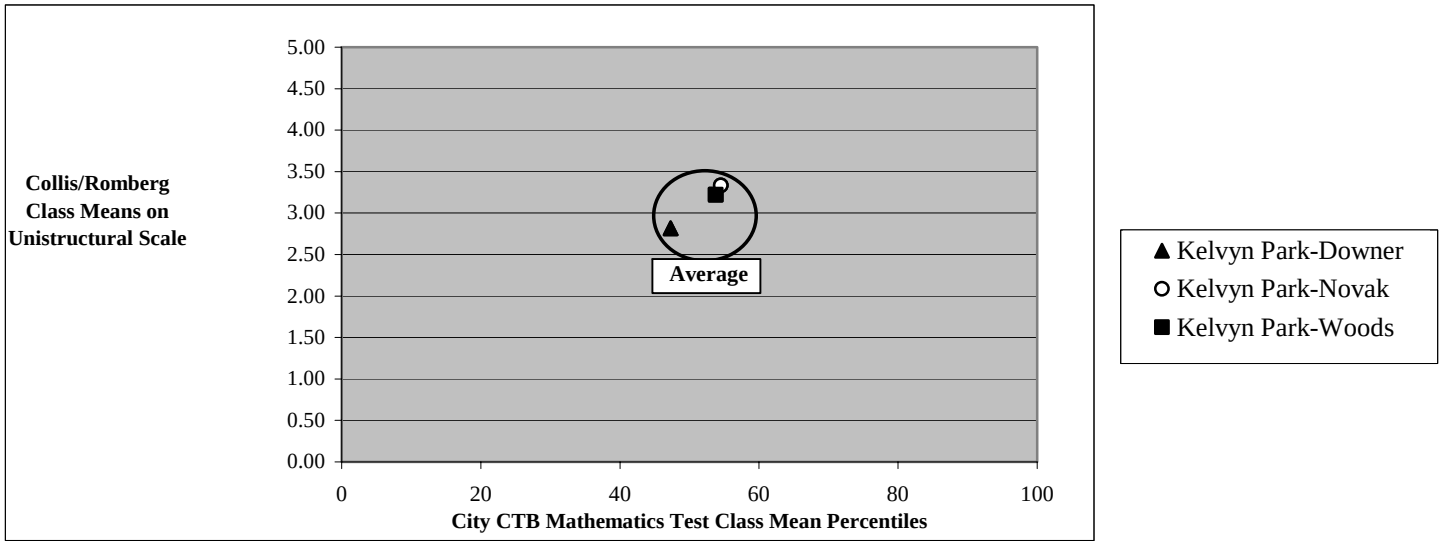


Figure 16. Scatter plot for class mean percentiles on the *TerraNova*- City CTB Mathematics Testand the class means on the unistructural scale of the Collis/Romberg reasoning test, Grade 8, District 4

Table 25

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics, by Teacher, in District 4

School-Teacher (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
					–MiC–					
Kelvyn Park-Downer (21)	20	2.19	20	2.20	20	2.40	20	2.05	20	1.98
Kelvyn Park-Novak (38)	28	2.01	28	1.96	28	2.07	28	1.77	28	2.04
Kelvyn Park-Woods (20)	19	2.27	19	1.93	19	2.28	19	1.85	19	2.07

(For detailed information, see Tables F8-F9 in Appendix F.)

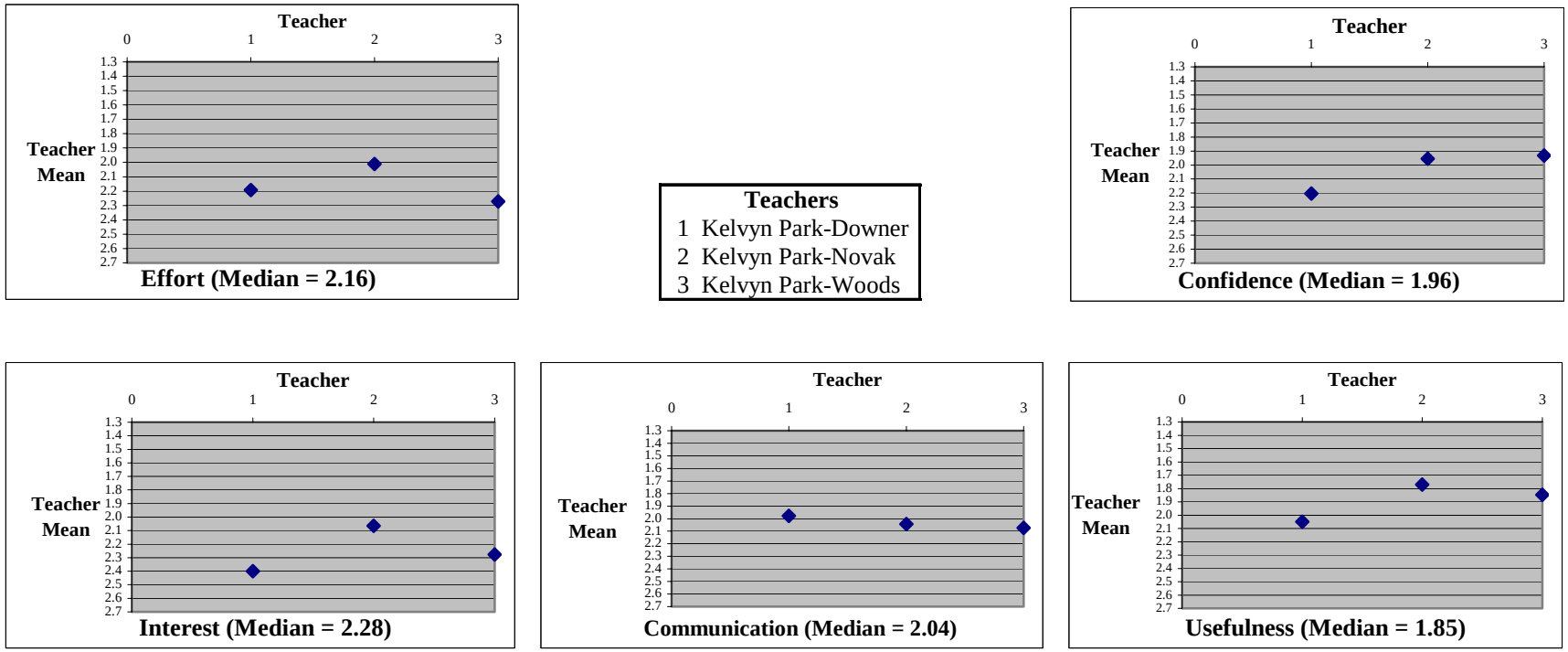


Figure 17. Plots showing class means on student judgments about mathematics, Grade 8, District 4

Table 26

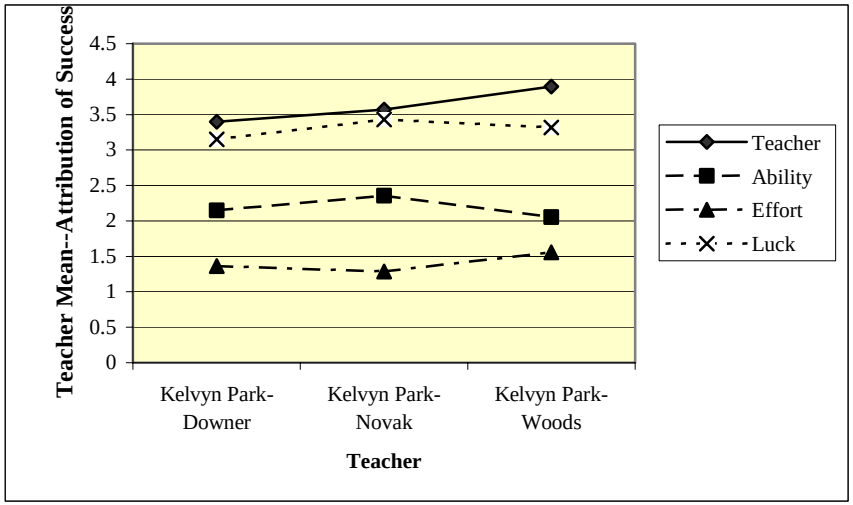
Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 4

School-Class (*N*)	Success							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Kelvyn Park-Downer (21)	20	3.40	20	2.15	20	1.36	20	3.15
Kelvyn Park-Novak (38)	28	3.57	28	2.36	28	1.29	28	3.43
Kelvyn Park-Woods (20)	19	3.89	19	2.05	19	1.56	19	3.32

School-Class (*N*)	Failure							
	Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–								
Kelvyn Park-Downer (21)	20	3.25	20	2.90	20	2.33	20	3.35
Kelvyn Park-Novak (38)	28	3.50	28	3.18	28	2.04	28	3.68
Kelvyn Park-Woods (20)	19	3.39	19	2.95	19	1.78	19	3.65

(For more detailed information, see Table F12 in Appendix F.)

(a)



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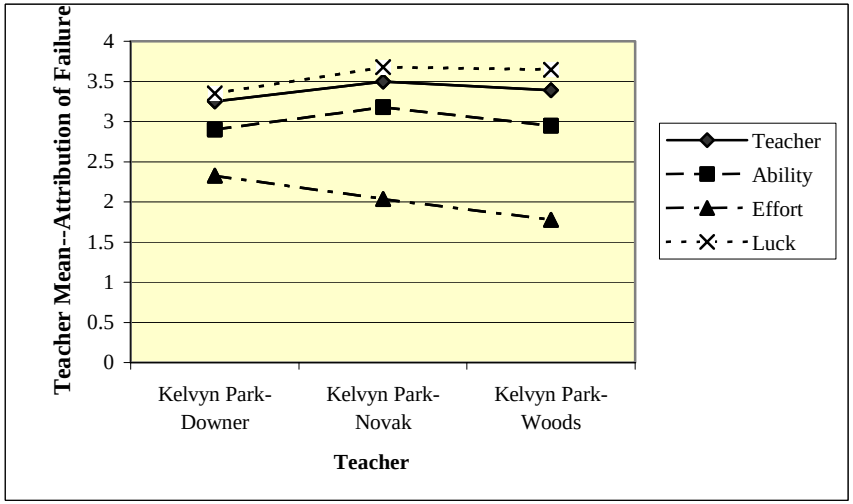

Figure 18. Line graphs showing class means of student attribution of (a) success and (b) failure in mathematics, Grade 8, District 4

Table 27

Student Preference Ranking of Classes in District 4, Grade 8

School-Teacher *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—						
Kelvyn Park-Downer (21)	42	5	0	5	5	5	0	26	0	11
Kelvyn Park-Novak (38)	21	4	32	0	4	18	0	7	0	14
Kelvyn Park-Woods (20)	11	17	17	0	0	11	6	11	0	28

[1] Other includes mutiple preferences.

Note: Response rates designate class mean percents.

(For detailed information, see Tables F13 in Appendix F.)

Table 28

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 4

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— *MiC* —															
Kelvyn Park-Downer (21)	19	32	47	5	16	19	16	42	21	21	19	42	32	16	11
Kelvyn Park-Novak (38)	29	21	27	31	21	29	3	52	21	24	29	24	34	14	28
Kelvyn Park-Woods 1 (20)	18	0	56	28	17	18	0	39	50	11	18	22	39	17	22

Note: Response rates designate class mean percents.

(For detailed information, see Tables F14 in Appendix F.)

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APPENDIX A

STUDENT BACKGROUND

A Longitudinal/Cross-Sectional Study of the Impact of *Mathematics in Context* on Student Mathematical Performance

Student Questionnaire

Mary C. Shafer

Wisconsin Center for Education Research
University of Wisconsin–Madison

Shafer, M. C. (1997). *Student questionnaire* (Working Paper No. 2). Madison, WI: University of Wisconsin–Madison.

The development of this instrument was supported by a grant from the National Science Foundation #REC-9553889 and the Wisconsin Center for Education Research, School of Education, University of Wisconsin-Madison. Any opinions, findings, or conclusions are those of the author(s) and do not necessarily reflect the views of the supporting agencies.

Description of Student Questionnaire

The Student Questionnaire was designed to gather information on students' fixed characteristics, their interest in mathematics class, the nature of their communication about mathematics, and ways they use mathematics in other classes. Items 3, 6, 7, 8, 10, 11, 12, 13, 14, and 15 on the Student Questionnaire were adapted from Webb & Dowling (1993).

The purpose of the first section of the Student Questionnaire is to collect information about students' names, date of birth, and schools attended. On Items 1–3, students list their (a) first name, last name, and middle initial; (b) date of birth; and (c) grade level during the current school year. Students' date of birth was useful in calculating the mean age of each class and in tracking individual students over time, particularly when they have common names (e.g., Juan Perez, Jack Smith) or when they used nicknames one year and formal names another (e.g., Kathy, Kathleen). On Item 4, students entered the name of the school they attended in the current school year and the city and state in which the school was located. During the second and third years of the study, students also entered the name of the school they had attended in the previous school year. This information was especially important for tracking fifth-grade students who were promoted to middle school and for students in districts with high mobility rates (e.g., Districts 2, 4). On Item 5, students entered the name of their teacher.

In the second section of the Student Questionnaire, information was gathered on students' fixed characteristics. On Item 6, students identified their sex. On Item 7, students identified their ethnicity. Based on input from district personnel involved in the longitudinal study, two categories were added prior to the first administration of the questionnaire: Multiracial and Haitian. Students were also given the option of specifying inclusion in a second group. Analysis of these responses proved difficult for two reasons. First, some students marked Multiracial and indicated "White" and an ethnic group such as "Italian." These responses were coded as "White." Some students circled two categories such as "Hispanic" and "White." These responses were coded "Multiracial." Other students listed religions such as Muslim. These responses were coded as "Other." In the analysis of these data, responses for students who participated in the longitudinal study for two years or for three years were reviewed together to look for consistency in responses. On Item 8, students circled whether they thought they communicated better in English or another language.

The purpose of the third section of the Student Questionnaire was to collect information about students' favorite subjects, which was addressed in Item 9. Students circled the school subject they enjoyed the most: social studies, science, math, reading, writing, art, music, physical education, band, or self-identified subject.

In the fourth section of the Student Questionnaire, Items 10–12, students identified the frequency with which they talked about three items with their classmates, friends, or acquaintances about: (a) mathematical ideas and ways to solve problems, (b) mathematical problems assigned for homework, and (c) ways that mathematics was used outside of school. Students circled a response on a scale that included Never, Sometimes, Often, and Very Often.

In the final section of the Student Questionnaire, students responded to three open-ended questions. On Item 13, students listed three things they enjoyed most, and on Item 14 three things they enjoyed least about their mathematics class. On item 15, students identified ways their knowledge of mathematics and the way they learned mathematics helped them in other classes. Responses from students in Grades 5, 6, and 7 were very

similar across grade levels. Because of the amount of time and resources used to code and synthesize responses to Items 13–15 for the first year of the study, responses on these items were not summarized for the following two years.

The Student Questionnaire was administered in the fall of each study year (see directions for administering the Student Questionnaire in this appendix). Teachers were instructed to assist students in completing Items 6–12 and to encourage students to complete Items 13–15.

Reference

Webb, N. L., & Dowling, M. (1993). *Evaluation study of the interactive mathematics program (IMP): A preliminary report on the results of questionnaires administered to teachers, students, and parents*. Madison, WI: University of Wisconsin–Madison.

Student Questionnaire

The Student Questionnaire is designed to collect information about students' background and their interests in studying mathematics. The Student Questionnaire should take less than one class period to complete.

Please ask students to clearly print their names and other requested information for Items 1–5.

Please assist students in circling the appropriate information for Items 6–8. Students may also need assistance in circling their responses to Items 9–12. Please encourage students to complete Items 13–15.

If a student is absent, please arrange for the student to complete the Student Questionnaire as soon as possible after returning to school.

After administering the questionnaire, please check that all students have clearly printed their names on the front of the questionnaire. Enclose the questionnaires (both completed and unused copies) in the provided envelopes for mailing to Madison.

We appreciate the work you have done in gathering information during the *Mathematics in Context* longitudinal study. We thank you for your continued participation and support.

Sincerely,

The Staff of the *Mathematics in Context* Longitudinal Study

Today's Date _____

STUDENT QUESTIONNAIRE

Please answer the questions on both sides of this paper as thoroughly as you can. Your responses will not affect your grade in any way, so answer as honestly as you can. When you finish answering all the questions, return this form to your teacher. Thank you for completing the information on this questionnaire.

1. Your Name:

_____

Last name First name Middle Initial

2. Date of birth: _____
Month - Day - Year

3. What grade are you in? _____grade__

4. Name of your school **THIS YEAR** _____

City: _____ State: _____

Name of your school **LAST YEAR** _____

City: _____ State: _____

5. Name of your teacher _____

6. What is your gender? (circle one)

Female …….. 1 Male…….. 2

7. How do you best describe yourself? (Circle as many as apply)

African American ……..… 1
American Indian, Eskimo, or Aleut … 2
Asian or Pacific Islander …… 3
Hispanic …… 4
White …… 5
Multiracial ……. 6
Haitian …….. 7
Other (specify) _____ 8

8. Do you communicate better in English than in any other language? (Circle one)

Yes…….. 1 No …….. 2

9. What class or subject area do you enjoy studying most? (Circle one)

Social Studies …….. 1
Science …… 2
Math …… 3
Reading …… 4
Writing …… 5
Art …… 6
Music ……7
Physical Education ……... 8
Band …….. 9
Other (specify) _____ 10

About how often do you talk about the following topics with your classmates, friends, and other acquaintances? (Please circle one for each item)

	Never	Sometimes	Often	Very Often
10. Mathematical ideas and ways to solve problems.	0	1	2	3
11. Mathematical problems assigned for homework.	0	1	2	3
12. The ways that mathematics is used outside of school.	0	1	2	3

13. What are three things that you enjoy the <u>most</u> about math class?

_____
_____
_____
_____

14. What are three things that you enjoy the <u>least</u> about math class?

_____
_____
_____
_____

15. How has your knowledge of mathematics and the way you learn mathematics helped you in other classes such as science and social studies?

_____
_____
_____
_____

APPENDIX B

STUDENT ATTITUDE INVENTORY

A Longitudinal/Cross-Sectional Study of the Impact of *Mathematics in Context* on Student Mathematical Performance

Student Attitude Inventory

Mary C. Shafer, Lesley R. Wagner, and Jon Davis

Wisconsin Center for Education Research
University of Wisconsin–Madison

Shafer, M. C., Wagner, L. R., & Davis, J. (1997). *Student attitude inventory* (*Mathematics in Context* Longitudinal/Cross-Sectional Study Working Paper No. 7). Madison, WI: University of Wisconsin–Madison.
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The development of this instrument was supported by a grant from the National Science Foundation #REC-9553889 and by the Wisconsin Center for Education Research, School of Education, University of Wisconsin-Madison. Any opinions, findings or conclusions are those of the author(s) and do not necessarily reflect the views of the supporting agencies.

Description of Student Attitude Inventory

The Student Attitude Inventory was designed to characterize the attitudes of middle-school students toward mathematics and toward themselves as learners of mathematics. The Student Attitude Inventory is composed of two sections: statements rated on a Likert scale, and open-response items. The first section of the Student Attitude Inventory is a set of statements written to reflect important constructs related to students' attitudes and beliefs about mathematics and themselves as learners of mathematics. The statements were grouped into seven subscales: effort to succeed in mathematics, interest in and excitement about mathematics, confidence in learning mathematics, communication of mathematical ideas, usefulness of mathematics, general perceptions about mathematics and learners of mathematics, and attribution of success and failure in perceptions of mathematics. The statements on the attitude instrument are collections of items used in previous research on student attitudes (Dossey, Mullis, Gorman, & Latham, 1994; Fennema & Sherman, 1986; Kloosterman & Stage, 1992; Schoenfeld, 1989). These items were reworded to update the terminology and to facilitate their use with younger audiences than those for which they were originally intended. New items were also composed to reflect current constructs of import within the reform movement, (e.g., technology, communication, collaboration). Each subscale consist of from 5–16 statements worded to show eiher positive or negative attitudes relevant ‘to the context’ of the subscale.

Following Schoenfeld (1989), each statement was accompanied by a 4-point Likert scale indicating student level of agreement: “very true," “sort of true,” “not very true,” “not true at all.” The direction of the scoring weights assigned to the response categories depends on whether a particular statement was worded favorably or unfavorably (Edwards & Porter, 1972). If a statement was worded favorably, scoring weights assigned to the four categories would be 1 for "Very True," 2 for "Sort of True," 3 for "Not Very True," and 4 for "Not True at All." If a statement reflected a “negative” attitude, the direction of the scoring weights was reversed (e.g., "Not True at All" received a score of 1, and so on). Thus a reflected “negative” attitude ratings on two related but contradictory statements should have resulted in approximately the same score. Computing the mean score of the subscale provided an overall indication of the individual's attitudes with respect to a particular subscale. In this attitude inventory, students had relatively low scores if their responses to students reflected a positive attitude and relatively high scores if their responses reflected a negative attitude to a given subscale. Conversely, students will have relatively high scores.

Pilot-test. Initially, 75 statements reflecting the beliefs represented in the seven subscales were written. Nine educators (classroom teachers, professors, and graduate students) then read through the 75 statements and sorted them into subscales. Statements categorized into subscales with 79% or more agreement maintained their initial placement in the subscales. Items with less than 79% agreement were reworded, moved to a different subscale, or dropped. Sixty-five items remained and were randomly distributed throughout the inventory with efforts made to avoid using items from the same subscale in succession. The instrument was then pilot-tested in both reform and conventional elementary- and middle-school classrooms to test for reliability. A time limit was not given for completing the inventory; administration typically took between 20 and 30 minutes. Inter-item correlation, squared multiple correlation, and reliability (Cronbach’s alpha) were calculated for each subscale after a given item was removed from it. As a result, the inventory was pared down to 60 Likert-scale items.

Subscales

Effort. The effort subscale measured students' belief that with sufficient effort, anyone could learn mathematics and improve their mathematical abilities. The subscale included the following statements:

2. If I try hard, I can do well in math.
21. If a problem we worked on in math doesn't get solved during class, I still think about it after class is over and try to figure it out even if the teacher didn't tell me to.
33. If I don't understand a math problem, I give up without trying very hard to figure it out.
43. If I can't solve a math problem right away, I give up after a few minutes.
46. If I have trouble figuring out a problem right away, I don't like to stop working on it until I get an answer that makes sense.
58. I try not to do more work in math than I have to.

Interest in and excitement about learning mathematics. The interest subscale measured students' enjoyment of learning mathematics. The subscale included the following statements:

1. I like mathematics.
10. I like learning new things in math.
13. Math is so hard to do, it isn't any fun.
17. I don't understand why some people seem to think math is fun.
24. I like to work on new math problems that are different from others that I have worked on before.
34. Math is my favorite class.
57. Learning mathematics is not interesting to me.

Confidence. The confidence subscale measured students' confidence in their abilities to learn mathematics and perform well on mathematical tasks. The subscale included the following statements:

9. I usually do not know the answers to the questions my teacher asks in math class.
18. I'm not the type of person who does well in math.
25. I don't get worried if my first plan to solve a problem doesn't work, since I know many ways to try to figure problems out.
31. Even if I don't understand a math problem right away, I know I will be able to figure it out if I work at it.
42. I am certain that I can do well in math classes that I will take later on in school.

Communication. The communication subscale measured students' beliefs about the importance of communication in developing mathematical understanding, both for the individual and for shared understanding in the classroom community. The subscale also measured students' beliefs about the teacher's interest in student ideas about mathematical content. The subscale included the following statements:

12. My classmates contribute important ideas which help me understand mathematics.
23. I have many chances during math class to answer questions and explain my ideas to my teacher and classmates.
29. I don't take part in discussions during math class very often.
32. I can learn a lot by working with other people to solve math problems.
35. Being able to explain your ideas clearly is an important part of learning mathematics.
47. I like to share my ideas during class discussions in math.
56. My teacher thinks my ideas about math.

Usefulness of mathematics. The usefulness subscale measured students' beliefs about the relevance of mathematics to daily life and about the usefulness of mathematics in helping people to acquire and succeed in jobs. The subscale included the following statements:

5. When I finish school, mathematics will not be important in my life.
15. Mathematics helps me make sense of things in the world.
19. Mathematics is important only because it is a subject I have to take in school.
26. I never see mathematics being used except when I'm in math class.
40. Knowing mathematics is not necessary in getting a good job.
50. I would like a job that uses mathematics often.
60. Mathematics is useful in everyone's life.

General perceptions. The general perception subscale measured attitudes related to calculator use, the nature of mathematics (problem solving versus facts or rules), the learning of mathematics (the importance of understanding a concept versus arriving at an answer), and connections of mathematics to other school subjects. One item related to confidence (Item 3) and two items related to effort (Items 11 and 37) were also included in the general perception subscale. When these items were included in the effort and confidence subscales, the reliability of each subscale was compromised. These items, however, were not deleted from the attitude inventory because of their significance in characterizing student attitudes toward mathematics.

Two items per concept were included in the general perceptions subscale to assure consistency of student responses (e.g., "Anyone who works hard enough can be good at math, no matter how hard a person works" and "Some people are just naturally good at math and some are just not"). Taken together, the items on the general perception subscale form a profile of a student's general conceptions of mathematics. The results in the general perception subscale, however, cannot be aggregated across items because the individual items cover a wide range of tangentially related conceptions; a mean score for the subscale would not yield meaningful results.

The general perceptions subscale measured students' beliefs about the nature of mathematics and the role of calculators in problem solving and in supporting accurate calculations. The subscale included the following statements:

3. I feel sure that I’m able to learn new ideas in math class.
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of.
16. It’s okay if I solve a math problem differently than my classmates do.
11. Anyone who works hard enough can be good at math.
37. No matter how hard a person works, some people are just naturally good at math and some are just not.
53. Knowing how to solve a problem is as important as getting the answer.
38. Answering questions correctly in math means only giving a number.
27. Understanding why an answer is right is not as important as getting the right answer.
49. It really doesn’t matter if you understand a math problem or how you get an answer as long as the answer you get is right.
55. Mathematics is mostly learned by memorizing facts and rules.
44. When my teacher asks a question, I will get it right if I had memorized the correct rule or fact.
45. If you have to use a calculator to solve a problem, you don’t really understand how to do the problem.
6. If I use a calculator to solve a problem, I can be sure it will always give me the right answer.
20. Mathematics is not related to any of my other school subjects.
39. Each new math topic I study is not related to ones I have learned before.
28. Mathematics is more difficult to understand than other subjects.

Attribution. The attributions subscale measured students' beliefs about the internal factors (ability and effort) or external factors (teacher or luck) that influenced their success and failure in mathematics. This subscale was composed of 10 items in four categories that characterized students' beliefs about the causes of their success or failure in mathematics. The ability category included items that elicited students' attribution of success or failure related to innate possession or lack of skill, talent, or the capacity to understand mathematics. The effort category was composed of items that measured the student's attribution of success or failure related to time and effort invested in studying mathematics and the student's attention to accuracy. The teacher category contained items that indicated whether a student attributed success or failure to the teacher's partiality toward that student. The luck category included items that related to students' attribution of success or failure to chance. Two items per category were included in the attributions subscale (see Table 1) to assure consistency of student responses (e.g., "When I do well in math, it's because the teacher likes me" and "When I don't do well in math, it's because the teacher doesn't like me"). Two additional items (Items 8 and 54) were included as fillers to support the results of the effort and luck categories.

Table 1
Categorization of Items in the Attribution Subscale

Attribution	Success	Failure
Teacher	14. When I do well in math, it's because the teacher likes me.	36. When I don't do well in math, it's because the teacher doesn't like me.
Ability	7. When I do well in math, it's because I'm naturally a good math student.	22. When I don't do well in math, it's because I'm not good at math.
Effort	41. When I do well in math, it's because I have worked hard.	59. When I don't do well in math, it's because I haven't studied hard enough.
Luck	30. When I do well in math, it's because I was lucky.	48. When I don't do well in math, it's because I was unlucky.

Fillers:
54. When I do well in math, I'm never sure how it happened.
8. When I don't do well in math, it's because I was careless.

Similar to the general perception subscale, the results of the attribution subscale cannot be aggregated across items. The individual items measured attribution of success or failure in relation to four distinct constructs. Furthermore, items worded to reflect a "negative" attitude were not reverse-scored. In the case of attribution, the response to a particular item indicates whether the student attributes success or failure in mathematics to a particular cause. For two related items that are compatible, one coded for success and one coded for failure, we expect the scores to be the same. Aggregating the results into a mean score for the subscale would not yield meaningful results.

Open-Response Items

In the second section of the Student Attitude Inventory, four open-ended items were included to allow students to provide more extensive answers on their ideas about mathematics and its uses outside of school. For Item 1, students listed words they associated with "mathematics." For Item 2, students listed occupations besides teaching that they believed required the use of mathematics. For Item 3, students described ways they used mathematics outside of class. For Item 4, students described other ways people might use mathematics. Responses for Item 4 did not reveal any information different from Item 2. Therefore, responses to Item 4 were not coded or summarized. Responses from students in Grades 5, 6, and 7 were similar across grade levels. Because of the amount of time and resources used to code and synthesize responses to Items 1–3 for the first year of the study, responses to these items and Item 4 were not summarized for the second and third years of the study.

Administration in the Study

In the first year of the study, the Student Attitude Inventory was administered in September and May. The fall administration of the inventory was used as background information. The spring administration from the first study year was used as background information for the second year, in combination with the results of the inventory for students who began the study in the second year. The spring administration from the second study year was used as background information for the third year. The final administration of the Student Attitude Inventory occurred in the spring of the third study year. The results of this administration will be used for comparison purposes.

References

Dossey, J., Mullis, I., Gorman, S., & Latham, A. (1994). How school mathematics functions: Perspectives from the NAEP 1990 and 1992 assessments (Report No. 23-FR-02). Washington, DC: Office of Educational Research and Improvement.

Edwards, A., & Porter, B. (1972). Attitude measurement. In W. H. Barber, J. Crawford, A. L. Edwards, O. J. Harvey, D. C. McClelland, F. McDonald, C. Kielsmeier, B. Porter, C. D. Spielberger & P. A. Twelker (contributors), *The affective domain: A resource book for media specialists*. Washington, DC: Gryphon House.

Fennema, E., & Sherman, J. (1986). Fennema–Sherman mathematics attitudes scales: Instruments designed to measure attitudes toward the learning of mathematics by females and males. *Journal for Research in Mathematics Education, 7*(5), 324–326.

Kloosterman, P., & Stage, F. (1992). Measuring beliefs about mathematical problem solving. *School Science and Mathematics*, *92*(3), 109–115.

Schoenfeld, A. (1989). Explorations of students' mathematical beliefs and behavior. *Journal for Research in Mathematics Education*, *20*(4), 338–355.

Student Attitude Inventory

The Student Attitude Inventory was designed to elicit information related to seven subscales including effort to learn mathematics, interest and excitement about mathematics, and general perceptions of the nature of mathematics.

The Student Attitude Inventory will take one (45-minute) class period to administer. When you administer the assessment, please read the instruction page aloud as the students follow along. (The instruction page is on the booklet cover.) In Part I, students circle the number under the answer that tells best what they think or feel for each statement. In Part II, students complete four open-response questions.

All students should indicate the date they completed the inventory. In the event a student is no longer in your class, please indicate that on the booklet and return the booklet with the class set. We have enclosed a few extra booklets for you in case your class enrollment has changed. If students use the extra booklets, please make sure that name, school, and teacher blanks are completed.

If students are absent on the days you administer the inventory, please arrange for these students to complete the inventory as soon as possible after they return to school.

Enclose the questionnaires (both completed and unused copies) in the provided envelopes for mailing to Madison.

We appreciate the work you have done in gathering information during the *Mathematics in Context* Longitudinal Study. We thank you for your continued participation and support.

Sincerely,

The Staff of the *Mathematics in Context* Longitudinal Study

Student Attitude Inventory

Student Name _____

Teacher Name _____

School _____

Date _____

On the following pages you will find some statements about math. This is NOT a test. There are no right or wrong answers. Your teacher will not see your answers, and your answers will not affect your grade. We are interested in your opinions and your ideas about math, so answer the questions as honestly as you can.

DIRECTIONS:

Part I:
You will be asked to tell how much you agree or disagree with statements about math. Each statement is followed by four numbers. For each statement, decide which answer best shows how you feel. Then, circle the number under the answer that tells best what you think or feel. Circle only one number for each statement.

Sometimes you might be given a statement such as:

	very true	sort of true	not very true	not true at all
Red is a beautiful color.	1	2	3	4

If you think this statement is very true, circle the number 1.
If you think this statement is sort of true, circle the number 2.
If you think this statement is not very true, circle the number 3.
If you think this statement is not true at all, circle the number 4.

Here is a practice question for you.

Suppose you are given the statement:

	very true	sort of true	not very true	not true at all
It is more fun to play outdoors than indoors.	1	2	3	4

If you think that this statement is very true, circle the number 1.
If you think that this statement is sort of, but not always, true, circle the number 2.
If you think that this statement is not very true, but you don't disagree with it entirely, circle the number 3.
If you think that this statement is not true at all, circle the number 4.

Think carefully about each statement, but do not spend too much time on any one statement. If you are not sure of an answer, skip it and come back to it once you have answered all the other questions. However, make sure you answer ALL the questions. Remember to choose the answer that tells best how YOU feel about each statement. The only right answers are the ones that you believe are true.

Part II:
You will be asked a question about mathematics. Please give a short answer for each question. You do not have to write in complete sentences.

Part I. Select the answer that tells best how you feel about each statement. Circle only one answer for each statement.

	very true	sort of true	not very true	not true at all
1. I like mathematics.	1	2	3	4
2. If I try hard, I can do well in math.	1	2	3	4
3. I feel sure that I am able to learn new ideas in math class.	1	2	3	4
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of.	1	2	3	4
5. When I finish school, mathematics will not be important in my life.	1	2	3	4
6. If I use a calculator to solve a problem, I can be sure it will always give me the right answer.	1	2	3	4
7. When I do well in math, it's because I'm naturally a good math student.	1	2	3	4
8. When I don't do well in math, it's because I was careless.	1	2	3	4
9. I usually do not know the answers to the questions my teacher asks in math class.	1	2	3	4
10. I like learning new things in math.	1	2	3	4
11. Anyone who works hard enough can be good at math.	1	2	3	4
12. My classmates contribute important ideas which help me understand mathematics.	1	2	3	4
13 Math is so hard to do, it isn't any fun.	1	2	3	4
14. When I do well in math, it's because the teacher likes me.	1	2	3	4
15. Mathematics helps me make sense of things in the world.	1	2	3	4

		very true	sort of true	not very true	not true at all
16.	It's okay if I solve a math problem differently than my classmates do.	1	2	3	4
17.	I don't understand why some people seem to think math is fun.	1	2	3	4
18.	I'm not the type of person who does well in math.	1	2	3	4
19.	Mathematics is important only because it is a subject I have to take in school.	1	2	3	4
20.	Mathematics is not related to any of my other school subjects.	1	2	3	4
21.	If a problem we worked on in math doesn't get solved during class, I still think about it after class is over and try to figure it out even if the teacher didn't tell me to.	1	2	3	4
22.	When I don't do well in math, it's because I'm not good at math.	1	2	3	4
23.	I have many chances during math class to answer questions and explain my ideas to my teacher and classmates.	1	2	3	4
24.	I like to work on new math problems that are different from others that I have worked on before.	1	2	3	4
25.	I don't get worried if my first plan to solve a problem doesn't work, since I know many ways to try to figure problems out.	1	2	3	4
26.	I never see mathematics being used except when I'm in math class.	1	2	3	4
27.	Understanding why an answer is right is not as important as getting the right answer.	1	2	3	4
28.	Mathematics is more difficult to understand than other subjects.	1	2	3	4
29.	I don't take part in discussions during math class very often.	1	2	3	4

		very true	sort of true	not very true	not true at all
30.	When I do well in math, it's because I was lucky.	1	2	3	4
31.	Even if I don't understand a math problem right away, I know I will be able to figure it out if I work at it.	1	2	3	4
32.	I can learn a lot by working with other people to solve math problems.	1	2	3	4
33.	If I don't understand a math problem, I give up without trying very hard to figure it out.	1	2	3	4
34.	Math is my favorite class.	1	2	3	4
35.	Being able to explain your ideas clearly is an important part of learning mathematics.	1	2	3	4
36.	When I don't do well in math, it's because the teacher doesn't like me.	1	2	3	4
37.	No matter how hard a person works, some people are just naturally good at math and some are just not.	1	2	3	4
38.	Answering questions correctly in math means only giving a number.	1	2	3	4
39.	Each new math topic I study is not related to ones I have learned before.	1	2	3	4
40.	Knowing mathematics is not necessary to get a good job.	1	2	3	4
41.	When I do well in math, it's because I have worked hard.	1	2	3	4
42.	I am certain that I can do well in math classes that I will take later on in school.	1	2	3	4
43.	If I can't solve a math problem right away, I give up after a few minutes.	1	2	3	4

		very true	sort of true	not very true	not true at all
44.	When my teacher asks a question I will get it right if I have memorized the correct rule or fact.	1	2	3	4
45.	If you have to use a calculator to solve a problem, you don't really understand how to do the problem.	1	2	3	4
46.	If I have trouble figuring out a problem right away, I don't like to stop working on it until I get an answer that makes sense.	1	2	3	4
47.	I like to share my ideas during class discussions in math.	1	2	3	4
48.	When I don't do well in math, it's because I was unlucky.	1	2	3	4
49.	It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right.	1	2	3	4
50.	I would like a job that uses mathematics often.	1	2	3	4
51.	Mathematics is boring.	1	2	3	4
52.	I work hard at mathematics because I know that it will be useful for me.	1	2	3	4
53.	Knowing how to solve a problem is as important as getting the answer.	1	2	3	4
54.	When I do well in math, I'm never sure how it happened.	1	2	3	4
55.	Mathematics is mostly learned by memorizing facts and rules.	1	2	3	4
56.	My teacher thinks my ideas about math are important.	1	2	3	4
57.	Learning mathematics is not interesting to me.	1	2	3	4
58.	I try not to do more work in math than I have to.	1	2	3	4
59.	When I don't do well in math, it's because I haven't studied hard enough.	1	2	3	4
60.	Mathematics is useful in everyone's life.	1	2	3	4

Part II. Please give a short answer to each of the following questions in the space following the question. You do not have to write in complete sentences.

1. List words that you think of when you hear “mathematics.”

2. List jobs besides teaching that require mathematics.

3. Describe how you use mathematics outside of class.

4. Describe other ways people might use mathematics.

APPENDIX C

GRADE 7, DISTRICT 1

Table C1

Fixed Characteristics for Seventh-Grade Classes in District 1

School-Class *(N)*	**Sex *(N)***		**Language Preference *(%)* *** *(self-identified)*		**Ethnicity *(%)*** *(self-identified)*								
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Native American**	**Asian**	**Hispanic**	**White**	**Multi-racial**	**Haitian**	**Other**	**Non-Response**
—MiC—													
Addams-St. James 1 (8)	6	2	88	0	38	0	0	13	38	13	0	0	0
Von Humboldt-Botkin 1 (3)	2	1	67	33	0	0	0	33	33	0	0	0	33
Von Humboldt-Botkin 2 (9)	4	5	67	22	22	0	0	11	11	22	0	11	22
Von Humboldt-Botkin 3 (6)	3	3	83	0	50	0	0	0	50	0	0	0	0
Von Humboldt-Botkin 4 (15)	9	6	100	0	0	0	20	7	67	7	0	0	0
Von Humboldt-Botkin 5 (11)	6	5	55	36	18	0	0	9	36	0	0	0	36
Von Humboldt-Muldoon 1 (20)	11	9	80	10	15	0	0	0	60	15	0	0	10
Von Humboldt-Muldoon 2 (11)	5	6	64	9	45	0	0	0	36	18	0	0	0
Von Humboldt-Muldoon 3 (17)	10	7	73	6	0	6	12	0	71	0	0	0	12
Von Humboldt-Muldoon 4 (13) L***	7	6	62	38	31	0	8	0	15	8	0	0	38
—Conventional—													
Fernwood-Hodge 1 (16)	7	9	94	0	13	0	0	13	50	25	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** Longitudingal students, whole class not in study.

Table C2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 1

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preferen	Non-Respons	African America	Native America	Asian	Hispanic	White	Multi-racial	Haitian	Other	Non-Respons
Longitudinal Years 1, 2, & 3													
—MiC—													
Addams-St. James 1 (5)	4	1	100	0	40	0	0	20	40	0	0	0	0
Von Humboldt-Botkin 1 (1)	0	1	100	0	0	0	0	0	100	0	0	0	0
Von Humboldt-Botkin 2 (4)	3	1	75	25	25	0	0	25	0	25	0	0	25
Von Humboldt-Botkin 3 (2)	1	1	100	0	100	0	0	0	0	0	0	0	0
Von Humboldt-Botkin 4 (9)	6	3	100	0	0	0	22	0	78	0	0	0	0
Von Humboldt-Botkin 5 (2)	1	1	100	0	0	0	0	0	100	0	0	0	0
Von Humboldt-Muldoon 1 (3)	1	2	67	0	0	0	0	0	100	0	0	0	0
Von Humboldt-Muldoon 2 (3)	3	0	100	0	33	0	0	0	33	33	0	0	0
Von Humboldt-Muldoon 3 (5)	3	2	80	20	0	0	40	0	40	0	0	0	20
—Conventional—													
Fernwood-Hodge 1 (3)	3	0	100	0	0	0	0	0	33	67	0	0	0
Longitudinal Years 2 & 3													
—MiC—													
Addams-St. James 1 (3)	2	1	33	67	33	0	0	0	33	33	0	0	0
Von Humboldt-Botkin 1 (2)	2	0	50	50	50	0	0	0	0	0	0	0	50
Von Humboldt-Botkin 2 (5)	3	2	60	40	20	0	0	0	20	20	0	20	20
Von Humboldt-Botkin 3 (4)	2	2	75	0	25	0	0	0	75	0	0	0	0
Von Humboldt-Botkin 4 (6)	3	3	100	0	0	0	17	17	50	17	0	0	0
Von Humboldt-Botkin 5 (9)	5	4	44	44	22	0	0	11	22	0	0	0	44
Von Humboldt-Muldoon 1 (17)	10	7	82	12	18	0	0	0	53	18	0	0	12
Von Humboldt-Muldoon 2 (8)	2	6	50	13	50	0	0	0	38	13	0	0	0
Von Humboldt-Muldoon 3 (12)	7	5	92	8	0	8	0	0	83	0	0	0	8
Von Humboldt-Muldoon 4 (13)	7	6	62	38	31	0	8	0	15	8	0	0	38
—Conventional—													
Fernwood-Hodge 1 (13)	4	9	85	0	15	0	0	15	54	15	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table C3

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 1

School-Class *(N)*	TerraNova										
	Scale Score						National Percentile				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
					—MiC—						
Addams-St. James 1 (8)	7	25.71	9.18	12	23.0	39	37.57	25.99	5	26.0	78
Von Humboldt-Botkin 1 (3)	1	45.00	-	45	45.0	45	95.00	-	95	95.0	95
Von Humboldt-Botkin 2 (9)	7	25.29	11.00	10	27.0	43	37.43	29.61	5	38.0	89
Von Humboldt-Botkin 3 (6)	4	34.00	12.25	16	38.5	43	65.25	32.17	18	77.0	89
Von Humboldt-Botkin 4 (15)	12	45.50	2.71	40	46.0	49	94.08	5.60	81	96.0	99
Von Humboldt-Botkin 5 (11)	8	32.88	11.79	10	35.5	46	60.63	31.59	5	68.0	96
Von Humboldt-Muldoon 1 (20)	16	34.44	8.86	18	34.5	47	62.50	27.20	14	64.5	98
Von Humboldt-Muldoon 2 (11)	9	26.78	9.43	12	29.0	38	41.67	26.59	5	45.0	76
Von Humboldt-Muldoon 3 (17)	13	45.00	3.21	38	46.0	49	93.00	7.26	76	96.0	99
Von Humboldt-Muldoon 4 (13) L*	9	29.11	10.39	12	26	43	47.44	30.20	5	35	89
					—Conventional—						
Fernwood-Hodge 1 (16)	9	24.67	9.14	11	26.0	37	36.00	24.47	4	35.0	73

* Longitudingal students, whole class not in study.

Table C4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 1

School-Class *(N)*	TerraNova										
	Scale Score						National Percentile				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
Longitudinal Years 1, 2, & 3											
					—MiC—						
Addams-St. James 1 (5)	5	23.20	9.91	12	23.0	39	30.40	27.97	5	26.0	78
Von Humboldt-Botkin 1 (1)	0	-	-	-	-	-	-	-	-	-	-
Von Humboldt-Botkin 2 (4)	3	23.33	17.39	10	17.0	43	35.33	46.61	5	12.0	89
Von Humboldt-Botkin 3 (2)	1	16.00	-	16	16.0	16	18.00	-	18	18.0	18
Von Humboldt-Botkin 4 (9)	7	44.86	2.61	40	45.0	48	93.29	6.05	81	95.0	99
Von Humboldt-Botkin 5 (2)	2	40.50	7.78	35	40.5	46	81.00	21.21	66	81.0	96
Von Humboldt-Muldoon 1 (3)	2	35.00	14.14	25	35.0	45	63.50	44.55	32	63.5	95
Von Humboldt-Muldoon 2 (3)	3	28.67	12.10	15	33.0	38	48.00	34.83	9	59.0	76
Von Humboldt-Muldoon 3 (5)	5	45.80	2.49	42	46.0	49	94.60	4.98	86	96.0	99
					—Conventional—						
Fernwood-Hodge 1 (3)	2	26.00	15.56	15	26.0	37	44.50	40.31	16	44.5	73
Longitudinal Years 2 & 3											
					—MiC—						
Addams-St. James 1 (3) S	2	32.00	1.41	31	32.0	33	55.50	4.95	52	55.5	59
Von Humboldt-Botkin 1 (2)	1	45.00	-	45	45.0	45	95.00	-	95	95.0	95
Von Humboldt-Botkin 2 (5)	4	26.75	5.80	19	27.5	33	39.00	17.26	17	40.0	59
Von Humboldt-Botkin 3 (3)	3	40.00	3.00	37	40.0	43	81.00	8.00	73	81.0	89
Von Humboldt-Botkin 4 (6)	5	46.40	2.88	42	46.0	49	95.20	5.36	86	96.0	99
Von Humboldt-Botkin 5 (9)	6	30.33	12.31	10	35.0	42	53.83	32.94	5	66.5	86
Von Humboldt-Muldoon 1 (17)	14	34.36	8.67	18	34.5	47	62.36	26.47	14	64.5	98
Von Humboldt-Muldoon 2 (8)	6	25.83	8.98	12	27.5	36	38.50	24.70	5	40.0	70
Von Humboldt-Muldoon 3 (12)	8	44.50	3.66	38	45.5	49	92.00	8.55	76	95.5	99
Von Humboldt-Muldoon 4 (13)	9	29.11	10.39	12	26.0	43	47.44	30.20	5	35.0	89
					—Conventional—						
Fernwood-Hodge 1 (13)	7	24.29	8.38	11	26.0	36	33.57	22.29	4	35.0	70

Table C5

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 1

School-Class *(N)*	**Level of Student Performance**				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
		—MiC—			
Addams-St. James 1 (8)	8	3.38	1.50	0.38	0.13
Von Humboldt-Botkin 1 (3)	2	3.50	2.50	0.50	0.00
Von Humboldt-Botkin 2 (9)	5	3.20	1.40	0.40	0.00
Von Humboldt-Botkin 3 (6)	5	3.60	1.00	0.20	0.00
Von Humboldt-Botkin 4 (15)	15	4.20	2.67	0.73	0.07
Von Humboldt-Botkin 5 (11)	5	3.20	1.80	0.20	0.00
Von Humboldt-Muldoon 1 (20)	14	3.29	1.36	0.29	0.07
Von Humboldt-Muldoon 2 (11)	7	2.86	1.43	0.29	0.00
Von Humboldt-Muldoon 3 (17)	14	4.00	2.21	1.36	0.29
Von Humboldt-Muldoon 4 (13) L*	8	2.13	0.50	0.00	0.00
		—Conventional—			
Fernwood-Hodge 1 (16)	12	3.00	1.00	0.25	0.00

* Longitudingal students, whole class not in study.

Table C6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 1

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
—MiC—											
Addams-St. James 1 (8)	8			3.38		1.50		0.38		0.13	
Number		12.50%	50.00%		37.50%		0.00%		0.00%		0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	37.50%		37.50%		25.00%		0.00%		0.00%
Measurement		12.50%	25.00%		25.00%		0.00%		12.50%		25.00%
Chance&Data		50.00%	0.00%		12.50%		0.00%		0.00%		37.50%
Von Humboldt-Botkin 1 (3)	2			3.50		2.50		0.50		0.00	
Number		0.00%	50.00%		0.00%		50.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Von Humboldt-Botkin 2 (9)	5			3.20		1.40		0.40		0.00	
Number		0.00%	80.00%		0.00%		20.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	20.00%		40.00%		0.00%		0.00%		0.00%
Measurement		20.00%	20.00%		40.00%		0.00%		0.00%		20.00%
Chance&Data		40.00%	20.00%		20.00%		0.00%		0.00%		20.00%
Von Humboldt-Botkin 3 (6)	5			3.60		1.00		0.20		0.00	
Number		0.00%	80.00%		0.00%		20.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	20.00%		60.00%		0.00%		0.00%		20.00%
Measurement		0.00%	20.00%		40.00%		0.00%		0.00%		40.00%
Chance&Data		40.00%	20.00%		0.00%		0.00%		0.00%		40.00%
Von Humboldt-Botkin 4 (15)	15			4.20		2.67		0.73		0.07	
Number		0.00%	53.33%		40.00%		0.00%		6.67%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		6.67%	0.00%		46.67%		46.67%		0.00%		0.00%
Measurement		6.67%	13.33%		80.00%		0.00%		0.00%		0.00%
Chance&Data		40.00%	13.33%		20.00%		20.00%		0.00%		6.67%
Von Humboldt-Botkin 5 (11)	5			3.20		1.80		0.20		0.00	
Number		20.00%	40.00%		20.00%		20.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	20.00%		40.00%		0.00%		0.00%		0.00%
Measurement		0.00%	20.00%		80.00%		0.00%		0.00%		0.00%
Chance&Data		40.00%	0.00%		20.00%		0.00%		0.00%		40.00%

Table C6 *(continued)*

School-Class *(N)*	Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
Von Humboldt-Muldoon 1 (20)	14			3.29		1.36		0.29		0.07	
Number		7.14%	78.57%		7.14%		7.14%		0.00%		0.00%
Algebra		35.71%	64.29%		0.00%		0.00%		0.00%		0.00%
Space		14.29%	21.43%		42.86%		14.29%		7.14%		0.00%
Measurement		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Chance&Data		57.14%	35.71%		7.14%		0.00%		0.00%		0.00%
Von Humboldt-Muldoon 2 (11)	7			2.86		1.43		0.29		0.00	
Number		0.00%	71.43%		28.57%		0.00%		0.00%		0.00%
Algebra		42.86%	57.14%		0.00%		0.00%		0.00%		0.00%
Space		28.57%	14.29%		42.86%		14.29%		0.00%		0.00%
Measurement		28.57%	0.00%		42.86%		14.29%		0.00%		14.29%
Chance&Data		85.71%	0.00%		0.00%		0.00%		0.00%		14.29%
Von Humboldt-Muldoon 3 (17)	14			4.00		2.21		1.36		0.29	
Number		0.00%	50.00%		7.14%		28.57%		14.29%		0.00%
Algebra		7.14%	92.86%		0.00%		0.00%		0.00%		0.00%
Space		14.29%	7.14%		21.43%		50.00%		7.14%		0.00%
Measurement		14.29%	21.43%		50.00%		7.14%		7.14%		0.00%
Chance&Data		64.29%	7.14%		7.14%		21.43%		0.00%		0.00%
Von Humboldt-Muldoon 4 (13) *	8			2.13		0.50		0.00		0.00	
Number		0.00%	75.00%		25.00%		0.00%		0.00%		0.00%
Algebra		62.50%	37.50%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	25.00%		25.00%		0.00%		0.00%		0.00%
Measurement		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
—Conventional—											
Fernwood-Hodge 1 (16)	12			3.00		1.00		0.25		0.00	
Number		16.67%	75.00%		0.00%		8.33%		0.00%		0.00%
Algebra		41.67%	58.33%		0.00%		0.00%		0.00%		0.00%
Space		8.33%	50.00%		33.33%		8.33%		0.00%		0.00%
Measurement		41.67%	16.67%		41.67%		0.00%		0.00%		0.00%
Chance&Data		91.67%	0.00%		0.00%		8.33%		0.00%		0.00%

* Longitudingal students, whole class not in study.

Table C7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Seventh-Grade Classes in District 1

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
LONGITUDINAL YEARS 1, 2, & 3											
					—MiC—						
Addams-St. James 1 (5)				3.00		1.40		0.40		0.33	
Number		20.00%	40.00%		40.00%		0.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	20.00%		40.00%		40.00%		0.00%		0.00%
Measurement		0.00%	40.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		40.00%	0.00%		0.00%		0.00%		0.00%		60.00%
Von Humboldt-Botkin 1 (1)	1			2.00		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Space		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Von Humboldt-Botkin 2 (4)	3			2.67		1.33		0.67		0.00	
Number		0.00%	66.67%		0.00%		33.33%		0.00%		0.00%
Algebra		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	33.33%		33.33%		0.00%		0.00%		0.00%
Measurement		33.33%	0.00%		33.33%		0.00%		0.00%		33.33%
Chance&Data		33.33%	33.33%		0.00%		0.00%		0.00%		33.33%
Von Humboldt-Botkin 3 (2)	2			2.50		0.50		0.50		0.00	
Number		0.00%	50.00%		0.00%		50.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	50.00%		0.00%		0.00%		0.00%		50.00%
Measurement		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Chance&Data		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Von Humboldt-Botkin 4 (9)	9			4.11		2.67		0.67		0.00	
Number		0.00%	33.33%		66.67%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		11.11%	0.00%		44.44%		44.44%		0.00%		0.00%
Measurement		11.11%	22.22%		66.67%		0.00%		0.00%		0.00%
Chance&Data		44.44%	11.11%		11.11%		22.22%		0.00%		11.11%
Von Humboldt-Botkin 5 (2)	2			3.00		2.00		0.50		0.00	
Number		0.00%	50.00%		0.00%		50.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%

Table C7 *(continued)*

School-Class *(N)*		Level of Student Performance								
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
Von Humboldt-Muldoon 1 (3)	3			3.00		1.33		0.33		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	0.00%		33.33%		33.33%		0.00%		0.00%
Measurement		33.33%	0.00%		66.67%		0.00%		0.00%		0.00%
Chance&Data		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Von Humboldt-Muldoon 2 (3)	3			3.00		1.33		0.33		0.00	
Number		0.00%	33.33%		33.33%		0.00%		0.00%		33.33%
Algebra		33.33%	33.33%		0.00%		0.00%		0.00%		33.33%
Space		0.00%	0.00%		33.33%		33.33%		0.00%		33.33%
Measurement		0.00%	0.00%		33.33%		0.00%		0.00%		66.67%
Chance&Data		33.33%	0.00%		0.00%		0.00%		0.00%		66.67%
Von Humboldt-Muldoon 3 (5)	5			3.40		1.80		1.00		0.00	
Number		0.00%	60.00%		0.00%		40.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	0.00%		0.00%		60.00%		0.00%		0.00%
Measurement		40.00%	0.00%		60.00%		0.00%		0.00%		0.00%
Chance&Data		80.00%	0.00%		20.00%		0.00%		0.00%		0.00%
—Conventional—											
Fernwood-Hodge 1 (3)	3			3.33		1.00		0.33		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	66.67%		33.33%		0.00%		0.00%		0.00%
Measurement		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		0.00%		33.33%		0.00%		0.00%
LONGITUDINAL YEARS 2 & 3											
—MiC—											
Addams-St. James 1 (3)	3			4.00		1.67		0.33		0.33	
Number		0.00%	66.67%		33.33%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	66.67%		33.33%		0.00%		0.00%		0.00%
Measurement		33.33%	0.00%		33.33%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%

Table C7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Von Humboldt-Botkin 1 (2)	1			5.00		4.00		1.00		0.00	
Number		0.00%	0.00%		0.00%		100.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Von Humboldt-Botkin 2 (5)	2			4.00		1.50		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Measurement		0.00%	50.00%		50.00%		0.00%		0.00%		0.00%
Chance&Data		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Von Humboldt-Botkin 3 (4)	3			4.33		1.67		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		0.00%	33.33%		66.67%		0.00%		0.00%		0.00%
Chance&Data		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Von Humboldt-Botkin 4 (6)	6			4.33		2.67		0.83		0.17	
Number		0.00%	83.33%		0.00%		0.00%		16.67%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		50.00%		50.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		33.33%	16.67%		33.33%		16.67%		0.00%		0.00%
Von Humboldt-Botkin 5 (9)	3			3.33		1.67		0.00		0.00	
Number		33.33%	33.33%		33.33%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	33.33%		33.33%		0.00%		0.00%		0.00%
Measurement		0.00%	33.33%		66.67%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%
Von Humboldt-Muldoon 1 (17)	11			3.36		1.36		0.27		0.09	
Number		9.09%	72.73%		9.09%		9.09%		0.00%		0.00%
Algebra		36.36%	63.64%		0.00%		0.00%		0.00%		0.00%
Space		9.09%	27.27%		45.45%		9.09%		9.09%		0.00%
Measurement		54.55%	0.00%		45.45%		0.00%		0.00%		0.00%
Chance&Data		54.55%	36.36%		9.09%		0.00%		0.00%		0.00%

Table C7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	Unistructural		Multistructural		Relational		Extended Abstract		No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
Von Humboldt-Muldoon 2 (8)	5			2.80		1.20		0.20		0.00	
Number		0.00%	80.00%		20.00%		0.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	20.00%		40.00%		0.00%		0.00%		0.00%
Measurement		40.00%	0.00%		40.00%		20.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Von Humboldt-Muldoon 3 (12)	9			4.33		2.44		1.56		0.44	
Number		0.00%	44.44%		11.11%		22.22%		22.22%		0.00%
Algebra		11.11%	88.89%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	11.11%		33.33%		44.44%		11.11%		0.00%
Measurement		0.00%	33.33%		44.44%		11.11%		11.11%		0.00%
Chance&Data		55.56%	11.11%		0.00%		33.33%		0.00%		0.00%
Von Humboldt-Muldoon 4 (13)	8			2.13		0.50		0.00		0.00	
Number		0.00%	75.00%		25.00%		0.00%		0.00%		0.00%
Algebra		62.50%	37.50%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	25.00%		25.00%		0.00%		0.00%		0.00%
Measurement		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
—Conventional—											
Fernwood-Hodge 1 (13)	9			2.89		1.00		0.22		0.00	
Number		22.22%	66.67%		0.00%		11.11%		0.00%		0.00%
Algebra		44.44%	55.56%		0.00%		0.00%		0.00%		0.00%
Space		11.11%	44.44%		33.33%		11.11%		0.00%		0.00%
Measurement		33.33%	22.22%		44.44%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%

Table C8

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 1

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Addams-St. James 1 (8)	8	2.02	8	2.05	8	2.20	8	1.57	8	1.88
Von Humboldt-Botkin 1 (3)	2	1.42	2	1.20	2	1.50	2	1.50	2	1.71
Von Humboldt-Botkin 2 (9)	6	1.78	6	2.39	6	2.75	6	1.83	6	2.11
Von Humboldt-Botkin 3 (6)	6	2.17	6	2.33	6	2.58	6	1.81	6	1.95
Von Humboldt-Botkin 4 (15)	13	2.13	13	1.80	13	2.44	13	1.67	13	1.86
Von Humboldt-Botkin 5 (11)	8	2.08	8	2.10	8	2.73	8	1.84	8	2.02
Von Humboldt-Muldoon 1 (20)	16	2.14	16	2.08	16	2.46	16	1.92	16	2.16
Von Humboldt-Muldoon 2 (11)	8	2.14	8	2.05	8	2.39	8	1.79	8	2.11
Von Humboldt-Muldoon 3 (17)	12	2.11	12	1.98	12	2.64	12	1.51	12	1.89
Von Humboldt-Muldoon 4 (13) L*	8	2.10	8	2.05	8	2.57	8	2.36	8	2.48
–Conventional–										
Fernwood-Hodge 1 (16)	13	2.30	13	2.22	13	2.47	13	1.72	13	2.16

* Longitudingal students, whole class not in study.

Table C9

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 1

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
–MiC–					
Addams-St. James 1 (8)					
Count	8	8	8	8	8
Mean	2.02	2.05	2.20	1.57	1.88
Median	1.92	1.90	2.13	1.40	1.86
Minimum	1.67	1.40	1.88	1.38	1.57
Maximum	2.67	2.80	2.75	2.00	2.29
Std. Deviation	0.35	0.46	0.29	0.26	0.22
Von Humboldt-Botkin 1(3)					
Count	2	2	2	2	2
Mean	1.42	1.20	1.50	1.50	1.71
Median	1.42	1.20	1.50	1.50	1.71
Minimum	1.33	1.00	1.50	1.25	1.43
Maximum	1.50	1.40	1.50	1.75	2.00
Std. Deviation	0.12	0.28	0.00	0.35	0.40
Von Humboldt-Botkin 2 (9)					
Count	6	6	6	6	6
Mean	1.78	2.39	2.75	1.83	2.11
Median	1.67	1.90	2.56	1.63	1.93
Minimum	1.33	1.40	1.88	1.25	1.50
Maximum	2.83	4.00	4.00	2.88	3.00
Std. Deviation	0.53	1.05	0.71	0.62	0.57
Von Humboldt-Botkin 3 (6)					
Count	6	6	6	6	6
Mean	2.17	2.33	2.58	1.81	1.95
Median	2.00	2.40	2.88	1.88	2.00
Minimum	1.20	1.40	1.00	1.00	1.29
Maximum	3.00	3.00	3.13	2.50	2.43
Std. Deviation	0.71	0.64	0.80	0.49	0.42

Table C9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Von Humboldt-Botkin 4 (15)					
Count	13	13	13	13	13
Mean	2.13	1.80	2.44	1.67	1.86
Median	2.00	2.00	2.13	1.38	1.67
Minimum	1.17	1.00	1.25	1.25	1.29
Maximum	3.17	2.60	3.50	2.88	2.86
Std. Deviation	0.61	0.49	0.69	0.53	0.50
Von Humboldt-Botkin 5 (11)					
Count	8	8	8	8	8
Mean	2.08	2.10	2.73	1.84	2.02
Median	1.92	2.20	2.69	1.81	2.00
Minimum	1.00	1.40	2.13	1.50	1.43
Maximum	3.33	2.80	3.25	2.13	2.43
Std. Deviation	0.69	0.53	0.40	0.27	0.39
Von Humboldt-Muldoon 1 (20)					
Count	16	16	16	16	16
Mean	2.14	2.08	2.46	1.92	2.16
Median	2.00	2.00	2.44	1.88	2.14
Minimum	1.33	1.00	1.00	1.00	1.00
Maximum	3.50	3.60	4.00	3.38	3.14
Std. Deviation	0.59	0.61	0.72	0.63	0.62
Von Humboldt-Muldoon 2 (11)					
Count	8	8	8	8	8
Mean	2.14	2.05	2.39	1.79	2.11
Median	2.17	2.00	2.50	1.87	1.93
Minimum	1.33	1.40	1.00	1.25	1.50
Maximum	2.67	3.00	3.25	2.13	3.29
Std. Deviation	0.47	0.60	0.82	0.27	0.60

Table C9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Von Humboldt-Muldoon 3 (17)					
Count	12	12	12	12	12
Mean	2.11	1.98	2.64	1.51	1.89
Median	2.08	2.00	2.69	1.50	1.86
Minimum	1.67	1.20	1.38	1.13	1.43
Maximum	2.50	2.80	3.88	2.00	2.57
Std. Deviation	0.32	0.40	0.69	0.28	0.33
Von Humboldt-Muldoon 4 (13) L*					
Count	8	8	8	8	8
Mean	2.10	2.05	2.57	2.36	2.48
Median	2.00	2.10	2.63	2.31	2.36
Minimum	1.67	1.00	1.67	1.50	1.57
Maximum	2.67	2.80	3.38	3.00	4.00
Std. Deviation	0.36	0.60	0.57	0.53	0.74
–Conventional–					
Fernwood-Hodge 1 (16)					
Count	13	13	13	13	13
Mean	2.30	2.22	2.47	1.72	2.16
Median	2.40	2.40	2.57	1.63	2.00
Minimum	1.40	1.20	1.14	1.00	1.50
Maximum	3.33	3.20	4.00	2.88	3.00
Std. Deviation	0.61	0.54	0.73	0.52	0.50

* Longitudingal students, whole class not in study.

Table C10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 1, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Addams-St. James (8)	8	1.50	8	1.63	8	2.50	8	1.25	8	1.25	8	1.38	8	2.50	8	2.13
Von Humboldt-Botkin (44)	43	1.67	43	1.56	43	2.14	43	1.44	43	1.37	43	1.70	43	2.19	43	2.58
Von Humboldt-Muldoon (61)	44	1.84	44	1.68	43	2.14	44	1.55	43	1.35	43	1.37	42	2.05	43	2.51
—Conventional—																
Fernwood-Hodge (16)	13	1.38	13	1.77	13	2.54	13	1.31	13	1.31	13	1.85	13	2.23	13	2.62

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Addams-St. James (8)	8	2.50	8	1.38	8	2.00	8	3.13	8	2.13	8	1.63	8	1.75	8	2.75
Von Humboldt-Botkin (44)	43	2.88	43	1.47	43	2.00	43	2.98	43	2.53	43	1.84	43	1.58	57	2.75
Von Humboldt-Muldoon (61)	42	2.83	43	1.58	43	2.09	42	3.00	43	2.84	43	1.67	43	1.86	48	2.54
—Conventional—																
Fernwood-Hodge (16)	13	2.92	13	2.15	13	1.92	13	2.92	13	2.92	13	2.00	13	1.77	12	3.17

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table C11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 1

School-Class *(N)*	Item Number *(see Key)*																							
	3			**4**			**6**			**11**			**16**			**20**			**27**			**28**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Addams-St. James 1 (8)	8	1.50	0.53	8	1.63	0.74	8	2.50	0.93	8	1.25	0.46	8	1.25	0.46	8	1.38	0.74	8	2.50	1.07	8	2.13	0.99
Von Humboldt-Botkin 1 (3)	2	1.00	0.00	2	1.50	0.71	2	1.00	0.00	2	1.50	0.71	2	1.00	0.00	2	1.00	0.00	2	4.00	0.00	2	1.50	0.71
Von Humboldt-Botkin 2 (9)	6	1.67	0.52	6	1.67	0.52	6	2.17	1.17	6	1.50	0.84	6	1.83	1.33	6	2.33	1.21	6	2.17	1.47	6	2.50	1.22
Von Humboldt-Botkin 3 (6)	6	1.83	0.75	6	1.50	0.55	6	2.00	1.26	6	1.50	0.84	6	1.00	0.00	6	2.50	1.38	6	2.17	1.17	6	3.00	1.10
Von Humboldt-Botkin 4 (15)	13	1.69	0.63	13	1.54	0.78	13	2.08	0.95	13	1.46	0.52	13	1.31	0.48	13	1.38	0.77	13	1.85	1.14	13	2.92	0.76
Von Humboldt-Botkin 5 (11)	8	1.88	0.99	8	1.50	0.53	8	2.25	1.28	8	1.50	1.07	8	1.63	0.52	8	1.63	0.74	8	2.00	0.76	8	2.50	1.07
Von Humboldt-Muldoon 1 (20)	16	1.75	0.86	16	1.44	0.63	15	1.93	0.88	16	1.56	0.96	16	1.38	0.81	16	1.25	0.58	15	2.20	1.08	16	2.56	0.73
Von Humboldt-Muldoon 2 (11)	8	1.75	1.04	8	2.13	1.13	8	1.63	1.06	8	1.50	0.76	8	1.63	1.19	8	1.50	0.76	8	1.75	1.04	8	2.63	1.30
Von Humboldt-Muldoon 3 (17)	12	1.75	0.62	12	1.58	0.67	12	2.67	0.89	12	1.42	0.51	12	1.25	0.45	12	1.25	0.45	12	1.75	0.97	12	2.75	0.97
Von Humboldt-Muldoon 4 (13) L*	8	2.25	1.04	8	1.88	0.99	8	2.25	1.04	8	1.75	0.89	7	1.14	0.38	7	1.71	0.76	7	2.57	0.79	7	1.86	1.07
—Conventional—																								
Fernwood-Hodge 1 (16)	13	1.38	0.51	13	1.77	0.73	13	2.54	0.88	13	1.31	0.85	13	1.31	0.63	13	1.85	0.90	13	2.23	1.01	13	2.62	1.12

School-Class *(N)*	**37**			**38**			**39**			**44**			**45**			**49**			**53**			**55**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Addams-St. James 1 (8)	8	2.50	1.07	8	1.38	0.52	8	2.00	1.07	8	3.13	0.83	8	2.13	0.83	8	1.63	0.52	8	1.75	0.71	8	2.75	1.04
Von Humboldt-Botkin 1 (3)	2	2.50	0.71	2	1.00	0.00	2	1.50	0.71	2	3.50	0.71	2	3.00	1.41	2	1.00	0.00	2	1.00	0.00	6	2.33	0.82
Von Humboldt-Botkin 2 (9)	6	3.00	1.26	6	1.50	0.55	6	2.33	1.21	6	2.83	0.75	6	2.83	1.17	6	2.83	0.98	6	2.33	1.03	6	3.17	1.17
Von Humboldt-Botkin 3 (6)	6	3.83	0.41	6	1.50	0.55	6	2.17	1.17	6	2.83	1.17	6	2.50	1.38	6	2.50	1.38	6	1.50	0.55	13	2.38	1.12
Von Humboldt-Botkin 4 (15)	13	2.77	1.01	13	1.38	0.77	13	1.77	0.83	13	3.00	0.91	13	2.54	0.97	13	1.54	0.66	13	1.31	0.63	8	3.50	0.53
Von Humboldt-Botkin 5 (11)	8	2.75	1.16	8	1.75	1.16	8	2.13	0.99	8	2.88	0.99	8	2.63	0.74	8	1.50	0.76	8	1.50	0.76	16	2.69	0.95
Von Humboldt-Muldoon 1 (20)	15	2.80	1.08	16	1.56	0.96	16	2.25	0.86	16	2.88	0.96	16	2.88	0.96	16	1.75	1.13	16	1.94	1.00	8	2.38	1.06
Von Humboldt-Muldoon 2 (11)	8	2.88	1.13	8	1.38	0.52	8	2.25	1.16	8	2.75	1.04	8	2.75	0.89	8	2.13	1.13	8	1.88	0.99	12	2.50	0.80
Von Humboldt-Muldoon 3 (17)	12	2.75	0.97	12	1.33	0.49	12	1.83	0.72	12	3.25	0.62	12	2.67	0.89	12	1.25	0.45	12	1.42	0.90	7	2.86	1.07
Von Humboldt-Muldoon 4 (13) L	7	3.00	0.82	7	2.29	1.11	7	2.00	0.82	6	3.17	1.33	7	3.14	0.69	7	1.71	1.25	7	2.43	1.27	21	2.52	0.98
—Conventional—																								
Fernwood-Hodge 1 (16)	13	2.92	1.26	13	2.15	0.69	13	1.92	0.95	13	2.92	0.86	13	2.92	1.04	13	2.00	1.15	13	1.77	0.83	12	3.17	0.72

* Longitudingal students, whole class not in study.

Table C11 *(continued)*

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table C12

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 1

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Addams-St. James 1 (8)	8	3.88	8	3.25	8	1.38	8	3.25	8	3.86	8	3.25	8	2.50	8	3.86
Von Humboldt-Botkin 1 (3)	2	4.00	2	2.50	2	2.50	2	4.00	2	4.00	2	4.00	2	2.00	2	3.50
Von Humboldt-Botkin 2 (9)	6	3.33	6	3.17	6	1.67	6	2.83	6	3.83	6	2.50	6	3.17	6	3.00
Von Humboldt-Botkin 3 (6)	6	3.83	6	2.33	6	1.33	6	3.50	6	3.67	6	2.17	6	2.00	6	3.50
Von Humboldt-Botkin 4 (15)	13	3.77	13	2.85	13	1.54	13	3.54	13	3.54	13	3.62	13	2.00	13	3.38
Von Humboldt-Botkin 5 (11)	8	3.75	8	2.50	8	1.88	8	3.38	8	3.75	8	2.50	8	1.88	8	3.75
Von Humboldt-Muldoon 1 (20)	16	3.31	16	2.44	16	1.69	16	3.19	16	3.63	16	3.20	16	2.27	16	3.53
Von Humboldt-Muldoon 2 (11)	8	3.50	8	2.13	8	1.13	8	3.13	8	3.88	8	3.00	8	2.25	8	3.50
Von Humboldt-Muldoon 3 (17)	12	3.75	12	2.50	12	1.27	12	3.42	12	3.75	12	3.17	12	1.75	12	3.75
Von Humboldt-Muldoon 4 (13) L*	8	3.50	8	3.00	8	1.71	8	2.57	8	3.00	8	2.50	8	1.86	8	3.00
–Conventional–																
Fernwood-Hodge 1 (16)	13	3.85	13	2.31	13	1.08	13	3.15	13	3.46	13	3.08	13	1.50	13	3.54

* Longitudingal students, whole class not in study.

Table C13

Student Preference Ranking of Classes in District 1, Grade 7

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—						
Addams-St. James 1 (8)[2]	0	--	--	--	--	--	--	--	--	--	--
Von Humboldt-Botkin 1 (3)	2	0	50	0	0	0	0	0	0	50	0
Von Humboldt-Botkin 2 (9)	4	0	0	50	0	0	0	0	0	25	25
Von Humboldt-Botkin 3 (6)	2	0	0	0	0	0	0	0	100	0	0
Von Humboldt-Botkin 4 (15)	14	7	0	0	14	0	7	14	29	14	14
Von Humboldt-Botkin 5 (11)	6	0	0	0	0	0	0	0	67	0	33
Von Humboldt-Muldoon 1 (20)	16	0	0	13	6	0	6	6	25	25	19
Von Humboldt-Muldoon 2 (11)	11	0	9	18	9	0	9	0	9	18	27
Von Humboldt-Muldoon 3 (17)	11	0	9	0	0	0	0	18	36	36	0
Von Humboldt-Muldoon 4 (13) L[3]	1	0	0	0	100	0	0	0	0	0	0
					—Conventional—						
Fernwood-Hodge 1 (16)	15	0	13	13	7	0	7	0	27	7	27

[1] Other includes mutiple preferences.

[2] Preference data were unavailable.

[3] Longitudingal students, whole class not in study.

Table C14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 1

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— MiC —															
Addams-St. James 1 (8)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Von Humboldt-Botkin 1 (3)	2	0	100	0	0	2	0	0	100	0	2	50	50	0	0
Von Humboldt-Botkin 2 (9)	4	50	50	0	0	4	0	75	25	0	4	0	25	50	25
Von Humboldt-Botkin 3 (6)	2	0	50	0	50	2	0	0	0	100	2	50	0	50	0
Von Humboldt-Botkin 4 (15)	14	21	64	14	0	14	0	50	43	7	14	36	64	0	0
Von Humboldt-Botkin 5 (11)	6	33	33	33	0	6	0	67	33	0	6	67	0	33	0
Von Humboldt-Muldoon 1 (20)	16	31	56	13	0	16	13	63	13	13	16	44	38	19	0
Von Humboldt-Muldoon 2 (11)	10	30	30	40	0	10	30	30	20	20	10	20	50	0	30
Von Humboldt-Muldoon 3 (17)	11	9	64	27	0	11	0	36	64	0	11	45	45	9	0
Von Humboldt-Muldoon 4 (13) L*	1	0	100	0	0	1	0	0	100	0	1	0	100	0	0
—Conventional —															
Fernwood-Hodge 1 (16)	15	20	53	27	0	12	7	53	7	13	15	20	53	13	13

* Longitudingal students, whole class not in study.

APPENDIX C

GRADE 8, DISTRICT 1

Table C1

Fixed Characteristics for Eighth-Grade Classes in District 1

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African America	Native American	Asian	Hispanic	White	Multi-racial	Haitian	Other	Non-Response
—MiC—													
Fernwood-Dunn 1 (16)	9	7	100	0	6	0	0	13	56	19	0	6	0
Fernwood-Dunn 2 (10)	2	8	80	0	0	0	20	20	40	10	0	0	10
Von Humboldt-Reichers 1 (23)	15	8	100	0	26	0	0	0	57	17	0	0	0
Von Humboldt-Reichers 2 (15) L***	6	9	80	7	27	0	0	0	67	0	0	0	7
Von Humboldt-Reichers 3 (22)	15	7	91	5	27	0	0	0	64	9	0	0	0
Von Humboldt-Waters 1 (16)	9	7	88	0	31	0	0	0	50	13	0	0	6
Von Humboldt-Waters 2 (16)	9	7	100	0	19	0	0	0	44	31	0	0	6
Von Humboldt-Waters 3 (11) L	6	5	73	18	36	0	0	0	45	0	0	0	18
—Conventional—													
Addams-Wolfe 1 (24)	13	11	100	0	0	0	4	0	88	8	0	0	0
Addams-Wolfe 2 (26)	16	10	100	0	8	0	0	4	85	4	0	0	0
Fernwood-Pimm 1 (5)	1	4	80	0	20	0	0	20	60	0	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** L = Longitudinal students, whole class not in study.

Table C2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 1

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African America	Native American	Asian	Hispanic	White	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
—MiC—													
Fernwood-Dunn 1 (13)	6	7	100	0	0	0	0	15	69	15	0	6	0
Fernwood-Dunn 2 (8)	1	7	75	0	0	0	25	25	38	0	0	0	13
Von Humboldt-Reichers 1 (14)	8	6	100	0	14	0	0	0	71	14	0	0	0
Von Humboldt-Reichers 2 (11)	4	7	91	7	18	0	0	0	82	0	0	0	0
Von Humboldt-Reichers 3 (14)	12	2	93	7	29	0	0	0	64	0	0	0	7
Von Humboldt-Waters 1 (9)	5	4	100	0	33	0	0	0	56	0	0	0	11
Von Humboldt-Waters 2 (9)	4	5	100	0	11	0	0	0	56	22	0	0	11
Von Humboldt-Waters 3 (8)	5	3	88	0	50	0	0	0	50	0	0	0	0
—Conventional—													
Addams-Wolfe 2 (4)	3	1	100	0	0	0	0	25	75	0	0	0	0
Fernwood-Pimm 1 (3)	1	2	100	0	33	0	0	0	67	0	0	0	0
Longitudinal Years 2 & 3													
—MiC—													
Fernwood-Dunn 1 (3)	3	0	100	0	33	0	0	0	0	33	0	33	0
Fernwood-Dunn 2 (2)	1	1	100	0	0	0	0	0	50	50	0	0	0
Von Humboldt-Reichers 1 (9)	7	2	89	0	44	0	0	0	33	22	0	0	0
Von Humboldt-Reichers 2 (4)	2	2	50	25	50	0	0	0	25	0	0	0	25
Von Humboldt-Reichers 3 (8)	4	4	86	0	25	0	0	0	63	13	0	0	0
Von Humboldt-Waters 1 (7)	4	3	71	0	29	0	0	0	43	29	0	0	0
Von Humboldt-Waters 2 (7)	5	2	100	0	29	0	0	0	29	43	0	0	0
Von Humboldt-Waters 3 (3)	1	2	33	67	0	0	0	0	33	0	0	0	67
—Conventional—													
Addams-Wolfe 1 (24)	13	11	100	0	0	0	4	0	88	8	0	0	0
Addams-Wolfe 2 (22)	13	9	100	0	9	0	0	0	86	5	0	0	0
Fernwood-Pimm 1 (2)	0	2	50	0	0	0	0	50	50	0	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table C3

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 1

School-Class *(N)*	TerraNova										
	Scale Score						National Percentile				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
					—MiC—						
Fernwood-Dunn 1 (16)	8	16.63	7.19	8	16.5	27	22.13	18.64	3	20.0	52
Fernwood-Dunn 2 (10)	6	17.50	3.73	13	17.5	23	22.50	10.33	10	22.5	38
Von Humboldt-Reichers 1 (23)	19	23.53	8.61	11	21.0	40	40.05	25.22	7	32.0	89
Von Humboldt-Reichers 2 (15) L*	13	22.08	11.56	9	17.0	47	36.46	31.31	4	21.0	98
Von Humboldt-Reichers 3 (22)	15	22.40	7.18	11	20.0	35	36.67	21.44	7	29.0	74
Von Humboldt-Waters 1 (16)	14	25.14	10.22	11	23.5	44	45.50	29.34	7	39.5	96
Von Humboldt-Waters 2 (16)	12	21.50	7.90	13	20.0	37	34.83	23.39	10	29.5	81
Von Humboldt-Waters 3 (11) L	8	21.13	6.71	11	21.0	32	34.13	19.64	7	32.5	68
					—Conventional—						
Addams-Wolfe 1 (24)	20	37.00	7.78	19	38	48	78.35	20.29	27	83	99
Addams-Wolfe 2 (26)	21	30.38	6.97	14	30.0	39	61.38	20.84	13	62.0	87
Fernwood-Pimm 1 (5)	3	26.33	7.51	19	26	34	50.00	23.52	27	49	74

* L = Longitudinal students, whole class not in study.

Table C4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 1

School-Class *(N)*	TerraNova										
	Scale Score						National Percentile				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
Longitudinal Years 1, 2, & 3											
—MiC—											
Fernwood-Dunn 1 (13)	7	17.71	7.02	8	21.0	27	24.71	18.52	3	32.0	52
Fernwood-Dunn 2 (8)	6	17.50	3.73	13	17.5	23	22.50	10.33	10	22.5	38
Von Humboldt-Reichers 1 (14)	11	21.82	8.30	13	19.0	40	35.45	24.55	10	27.0	89
Von Humboldt-Reichers 2 (11)	9	18.44	7.21	11	16.0	33	26.33	21.20	7	18.0	70
Von Humboldt-Reichers 3 (14)	10	21.80	5.49	12	21.5	28	35.10	15.86	8	33.5	52
Von Humboldt-Waters 1 (9)	8	22.88	10.22	11	21.0	41	39.00	29.65	7	32.0	91
Von Humboldt-Waters 2 (9)	6	19.17	9.33	13	14.5	37	28.00	27.48	10	14.5	81
Von Humboldt-Waters 3 (8)	7	19.57	5.47	11	19.0	26	29.29	15.21	7	27.0	49
—Conventional—											
Addams-Wolfe 2 (4)	3	33.00	7.94	24	36	39	69.00	24.58	41	79	87
Fernwood-Pimm 1 (3)	2	26.50	10.61	19	26.5	34	50.50	33.23	27	50.5	74
Longitudinal Years 2 & 3											
—MiC—											
Fernwood-Dunn 1 (3)	1	9.00	-	9	9.0	9	4.00	-	4	4.0	4
Fernwood-Dunn 2 (2)	0	-	-	-	-	-	-	-	-	-	-
Von Humboldt-Reichers 1 (9)	8	25.88	9.01	11	27.5	40	46.38	26.36	7	45.0	89
Von Humboldt-Reichers 2 (4)	4	30.25	16.36	9	32.5	47	59.25	41.52	4	67.5	98
Von Humboldt-Reichers 3 (7)	5	23.60	10.48	11	19.0	35	39.80	32.01	7	27.0	74
Von Humboldt-Waters 1 (7)	6	28.17	10.30	14	28.5	44	54.17	29.16	13	57.0	96
Von Humboldt-Waters 2 (7)	6	23.83	6.11	15	25.5	31	41.67	18.34	16	46.5	65
Von Humboldt-Waters 3 (3)	1	32.00	-	32	32.0	32	68.00	-	68	68.0	68
—Conventional—											
Addams-Wolfe 1 (24)	20	37.00	7.78	19	38.0	48	78.35	20.29	27	83.0	99
Addams-Wolfe 2 (22)	18	29.94	6.95	14	29.5	39	60.11	20.69	13	60.5	87
Fernwood-Pimm 1 (2)	1	26.00	-	26	26.0	26	49.00	-	49	49.0	49

Table C5

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 1

School-Class *(N)*	**Level of Student Performance**				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
		—MiC—			
Fernwood-Dunn 1 (16)	14	3.86	2.00	1.00	0.07
Fernwood-Dunn 2 (10)	7	3.29	1.00	0.29	0.00
Von Humboldt-Reichers 1 (23)	17	3.47	1.76	0.82	0.53
Von Humboldt-Reichers 2 (15) L*	9	3.78	1.67	0.67	0.00
Von Humboldt-Reichers 3 (22)	14	2.93	1.21	0.50	0.00
Von Humboldt-Waters 1 (16)	9	3.22	1.44	0.11	0.00
Von Humboldt-Waters 2 (16)	9	2.44	1.00	0.33	0.00
Von Humboldt-Waters 3 (11)	8	3.13	0.63	0.00	0.00
		—Conventional—			
Addams-Wolfe 1 (24)	23	3.83	2.35	1.17	0.17
Addams-Wolfe 2 (26)	23	3.78	2.39	0.96	0.04
Fernwood-Pimm 1 (5)	3	3.00	1.00	0.33	0.33

* L = Longitudinal students, whole class not in study.

Table C6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 1

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
					—MiC—						
Fernwood-Dunn 1 (16)	14			3.86		2.00		1.00		0.07	
Number		28.57%	42.86%		7.14%		7.14%		7.14%		7.14%
Algebra		21.43%	71.43%		0.00%		0.00%		0.00%		7.14%
Space		14.29%	14.29%		50.00%		14.29%		0.00%		7.14%
Measurement		21.43%	21.43%		42.86%		7.14%		0.00%		7.14%
Chance&Data		50.00%	35.71%		0.00%		0.00%		0.00%		14.29%
Fernwood-Dunn 2 (10)	7			3.29		1.00		0.29		0.00	
Number		28.57%	57.14%		0.00%		14.29%		0.00%		0.00%
Algebra		42.86%	57.14%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	71.43%		28.57%		0.00%		0.00%		0.00%
Measurement		42.86%	14.29%		28.57%		14.29%		0.00%		0.00%
Chance&Data		57.14%	28.57%		14.29%		0.00%		0.00%		0.00%
Von Humboldt-Reichers 1 (23)	17			3.47		1.76		0.82		0.53	
Number		11.76%	64.71%		5.88%		11.76%		0.00%		5.88%
Algebra		35.29%	58.82%		0.00%		0.00%		0.00%		5.88%
Space		5.88%	23.53%		52.94%		11.76%		0.00%		5.88%
Measurement		29.41%	17.65%		35.29%		0.00%		0.00%		17.65%
Chance&Data		58.82%	5.88%		0.00%		5.88%		0.00%		29.41%
Von Humboldt-Reichers 2 (15) L	9			3.78		1.67		0.67		0.00	
Number		0.00%	66.67%		11.11%		22.22%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		11.11%	22.22%		44.44%		22.22%		0.00%		0.00%
Measurement		11.11%	11.11%		55.56%		22.22%		0.00%		0.00%
Chance&Data		55.56%	0.00%		0.00%		0.00%		0.00%		44.44%
Von Humboldt-Reichers 3 (22)	14			2.93		1.21		0.50		0.00	
Number		14.29%	35.71%		7.14%		42.86%		0.00%		0.00%
Algebra		28.57%	64.29%		0.00%		0.00%		0.00%		7.14%
Space		21.43%	28.57%		42.86%		7.14%		0.00%		0.00%
Measurement		21.43%	35.71%		21.43%		0.00%		0.00%		21.43%
Chance&Data		50.00%	7.14%		0.00%		0.00%		0.00%		42.86%
Von Humboldt-Waters 1 (16)	9			3.22		1.44		0.11		0.00	
Number		0.00%	77.78%		22.22%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		11.11%	0.00%		77.78%		11.11%		0.00%		0.00%
Measurement		33.33%	22.22%		22.22%		0.00%		0.00%		22.22%
Chance&Data		55.56%	11.11%		11.11%		0.00%		0.00%		33.33%

* L = Longitudinal students, whole class not in study.

Table C6 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance								
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Von Humboldt-Waters 2 (16)	9			2.44		1.00		0.33		0.00	
Number		11.11%	66.67%		11.11%		11.11%		0.00%		0.00%
Algebra		77.78%	22.22%		0.00%		0.00%		0.00%		0.00%
Space		22.22%	22.22%		33.33%		22.22%		0.00%		0.00%
Measurement		44.44%	11.11%		22.22%		0.00%		0.00%		22.22%
Chance&Data		44.44%	22.22%		0.00%		0.00%		0.00%		22.22%
Von Humboldt-Waters 3 (11) L	8			3.13		0.63		0.00		0.00	
Number		12.50%	87.50%		0.00%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		25.00%	50.00%		25.00%		0.00%		0.00%		0.00%
Measurement		12.50%	62.50%		25.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	0.00%		12.50%		0.00%		0.00%		12.50%
—Conventional—											
Addams-Wolfe 1 (24)	23			3.83		2.35		1.17		0.17	
Number		17.39%	30.43%		8.70%		39.13%		4.35%		0.00%
Algebra		17.39%	78.26%		0.00%		0.00%		4.35%		0.00%
Space		0.00%	8.70%		39.13%		43.48%		8.70%		0.00%
Measurement		17.39%	21.74%		52.17%		8.70%		0.00%		0.00%
Chance&Data		65.22%	8.70%		17.39%		8.70%		0.00%		0.00%
Addams-Wolfe 2 (26)	23			3.78		2.39		0.96		0.04	
Number		8.70%	39.13%		4.35%		43.48%		4.35%		0.00%
Algebra		26.09%	73.91%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	8.70%		60.87%		30.43%		0.00%		0.00%
Measurement		17.39%	4.35%		69.57%		8.70%		0.00%		0.00%
Chance&Data		69.57%	13.04%		8.70%		8.70%		0.00%		0.00%
Fernwood-Pimm 1 (5)	3			3.00		1.00		0.33		0.33	
Number		0.00%	66.67%		0.00%		0.00%		33.33%		0.00%
Algebra		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Measurement		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%

Table C7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Eighth-Grade Classes in District 1

School-Class *(N)*	*(N)*	Level of Student Performance								
		Prestructural *(%)*	**Unistructural** *(%)*	**Ave.**	**Multistructural** *(%)*	**Ave.**	**Relational** *(%)*	**Ave.**	**Extended Abstract** *(%)*	**Ave.**	**No Response** *(%)*
LONGITUDINAL YEARS 1, 2, & 3											
					—MiC—						
Fernwood-Dunn 1 (13)	13			3.46		1.46		0.38		0.08	
Number		30.77%	46.15%		7.69%		7.69%		7.69%		0.00%
Algebra		23.08%	76.92%		0.00%		0.00%		0.00%		0.00%
Space		15.38%	15.38%		53.85%		15.38%		0.00%		0.00%
Measurement		23.08%	23.08%		46.15%		7.69%		0.00%		0.00%
Chance&Data		53.85%	38.46%		0.00%		0.00%		0.00%		7.69%
Fernwood-Dunn 2 (8)	8			2.88		0.88		0.25		0.00	
Number		25.00%	50.00%		0.00%		12.50%		0.00%		12.50%
Algebra		37.50%	50.00%		0.00%		0.00%		0.00%		12.50%
Space		0.00%	62.50%		25.00%		0.00%		0.00%		12.50%
Measurement		37.50%	12.50%		25.00%		12.50%		0.00%		12.50%
Chance&Data		50.00%	25.00%		12.50%		0.00%		0.00%		12.50%
Von Humboldt-Reichers 1 (14)	14			2.71		1.07		0.14		0.00	
Number		14.29%	57.14%		7.14%		14.29%		0.00%		7.14%
Algebra		35.71%	57.14%		0.00%		0.00%		0.00%		7.14%
Space		7.14%	28.57%		57.14%		0.00%		0.00%		7.14%
Measurement		28.57%	21.43%		28.57%		0.00%		0.00%		21.43%
Chance&Data		64.29%	0.00%		0.00%		0.00%		0.00%		35.71%
Von Humboldt-Reichers 2 (11)	9			3.78		1.67		0.67		0.00	
Number		0.00%	66.67%		11.11%		22.22%		0.00%		18.18%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		18.18%
Space		11.11%	22.22%		44.44%		22.22%		0.00%		18.18%
Measurement		11.11%	11.11%		55.56%		22.22%		0.00%		18.18%
Chance&Data		55.56%	0.00%		0.00%		0.00%		0.00%		44.44%
Von Humboldt-Reichers 3 (14)	14			2.93		1.21		0.50		0.00	
Number		14.29%	35.71%		7.14%		42.86%		0.00%		0.00%
Algebra		28.57%	64.29%		0.00%		0.00%		0.00%		7.14%
Space		21.43%	28.57%		42.86%		7.14%		0.00%		0.00%
Measurement		21.43%	35.71%		21.43%		0.00%		0.00%		21.43%
Chance&Data		50.00%	7.14%		0.00%		0.00%		0.00%		42.86%
Von Humboldt-Waters 1 (9)	9			1.89		0.67		0.00		0.00	
Number		0.00%	66.67%		0.00%		0.00%		0.00%		33.33%
Algebra		33.33%	33.33%		0.00%		0.00%		0.00%		33.33%
Space		11.11%	0.00%		55.56%		0.00%		0.00%		33.33%
Measurement		22.22%	11.11%		11.11%		0.00%		0.00%		55.56%
Chance&Data		33.33%	11.11%		0.00%		0.00%		0.00%		55.56%

Table C7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Von Humboldt-Waters 2 (9)	8			2.13		0.75		0.25		0.00	
Number		12.50%	75.00%		12.50%		0.00%		0.00%		0.00%
Algebra		87.50%	12.50%		0.00%		0.00%		0.00%		0.00%
Space		25.00%	25.00%		25.00%		25.00%		0.00%		0.00%
Measurement		50.00%	12.50%		12.50%		0.00%		0.00%		25.00%
Chance&Data		50.00%	12.50%		0.00%		0.00%		0.00%		37.50%
Von Humboldt-Waters 3 (8)	8			3.13		0.63		0.00		0.00	
Number		12.50%	87.50%		0.00%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		25.00%	50.00%		25.00%		0.00%		0.00%		0.00%
Measurement		12.50%	62.50%		25.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	0.00%		12.50%		0.00%		0.00%		12.50%
—Conventional—											
Addams-Wolfe 2 (4)	4			4.00		2.50		0.75		0.00	
Number		0.00%	50.00%		25.00%		25.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		50.00%		50.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Fernwood-Pimm 1 (3)	3			3.00		1.00		0.33		0.33	
Number		0.00%	66.67%		0.00%		0.00%		33.33%		0.00%
Algebra		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Measurement		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%
LONGITUDINAL YEARS 2 & 3											
—MiC—											
Fernwood-Dunn 1 (3)	1			0.00		0.00		0.00		0.00	
Number		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Algebra		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Space		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Measurement		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Chance&Data		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%

Table C7 *(continued)*

School-Class *(N)*		Level of Student Performance								
	(N)	Prestructural *(%)*	Unistructural *(%)*	Unistructural Ave.	Multistructural *(%)*	Multistructural Ave.	Relational *(%)*	Relational Ave.	Extended Abstract *(%)*	Extended Abstract Ave.	No Response *(%)*
Fernwood-Dunn 2 (2)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Von Humboldt-Reichers 1 (9)	3			4.00		2.00		1.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		33.33%		66.67%		0.00%		0.00%
Measurement		33.33%	0.00%		66.67%		0.00%		0.00%		0.00%
Chance&Data		33.33%	33.33%		0.00%		33.33%		0.00%		0.00%
Von Humboldt-Reichers 2 (4)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Von Humboldt-Reichers 3 (7)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Von Humboldt-Waters 1 (7)	3			4.00		2.33		0.33		0.00	
Number		0.00%	33.33%		66.67%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		66.67%		33.33%		0.00%		0.00%
Measurement		33.33%	33.33%		33.33%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		33.33%		0.00%		0.00%		0.00%
Von Humboldt-Waters 2 (7)	1			5.00		3.00		1.00		0.00	
Number		0.00%	0.00%		0.00%		100.00%		0.00%		0.00%
Algebra		0.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%

Table C7 *(continued)*

School-Class *(N)*		*(N)*	Level of Student Performance									
			Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
			(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Von Humboldt-Waters 3 (3)		0			-		-		-		-	
	Number		-	-		-		-		-		-
	Algebra		-	-		-		-		-		-
	Space		-	-		-		-		-		-
	Measurement		-	-		-		-		-		-
	Chance&Data		-	-		-		-		-		-
—Conventional—												
Addams-Wolfe 1 (24)		23			3.83		2.35		1.17		0.17	
	Number		17.39%	30.43%		8.70%		39.13%		4.35%		0.00%
	Algebra		17.39%	78.26%		0.00%		0.00%		4.35%		0.00%
	Space		0.00%	8.70%		39.13%		43.48%		8.70%		0.00%
	Measurement		17.39%	21.74%		52.17%		8.70%		0.00%		0.00%
	Chance&Data		65.22%	8.70%		17.39%		8.70%		0.00%		0.00%
Addams-Wolfe 2 (22)		19			3.74		2.37		1.00		0.05	
	Number		10.53%	36.84%		0.00%		47.37%		5.26%		0.00%
	Algebra		31.58%	68.42%		0.00%		0.00%		0.00%		0.00%
	Space		0.00%	10.53%		63.16%		26.32%		0.00%		0.00%
	Measurement		21.05%	5.26%		63.16%		10.53%		0.00%		0.00%
	Chance&Data		63.16%	15.79%		10.53%		10.53%		0.00%		0.00%
Fernwood-Pimm 1 (3)		0			-		-		-		-	
	Number		-	-		-		-		-		-
	Algebra		-	-		-		-		-		-
	Space		-	-		-		-		-		-
	Measurement		-	-		-		-		-		-
	Chance&Data		-	-		-		-		-		-

Table C8

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 1

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Fernwood-Dunn 1 (16)	16	2.04	16	2.06	16	2.13	16	1.79	16	1.93
Fernwood-Dunn 2 (10)	10	1.95	10	1.98	10	1.99	10	1.64	10	1.89
Von Humboldt-Reichers 1 (23)	22	2.20	22	2.15	22	2.52	22	1.82	22	2.12
Von Humboldt-Reichers 2 (15) L*	12	2.54	12	2.15	12	2.78	12	2.05	12	2.49
Von Humboldt-Reichers 3 (22)	20	2.29	20	2.11	20	2.76	20	2.06	20	2.19
Von Humboldt-Waters 1 (16)	14	2.43	14	2.17	14	2.75	14	1.95	14	2.25
Von Humboldt-Waters 2 (16)	10	2.15	10	2.25	10	2.38	10	1.95	10	2.10
Von Humboldt-Waters 3 (11) L	10	2.10	10	2.08	10	2.76	10	2.04	10	2.39
–Conventional–										
Addams-Wolfe 1 (24)	23	1.92	23	1.81	23	2.09	23	1.68	23	1.88
Addams-Wolfe 2 (26)	25	2.29	25	2.13	25	2.42	25	1.70	25	2.07
Fernwood-Pimm 1 (5)	5	2.00	5	2.20	5	2.15	5	1.95	5	2.14

* L = Longitudinal students, whole class not in study.

Table C9

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 1

School-Class *(N)*	**Subscale *(1 = very true; 4 = not true at all)***				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
			–MiC–		
Fernwood-Dunn 1 (16)					
Count	16	16	16	16	16
Mean	2.04	2.06	2.13	1.79	1.93
Median	2.08	2.00	2.00	1.75	1.93
Minimum	1.33	1.40	1.13	1.00	1.29
Maximum	3.00	3.60	3.88	2.75	2.57
Std. Deviation	0.53	0.65	0.73	0.49	0.40
Fernwood-Dunn 2 (10)					
Count	10	10	10	10	10
Mean	1.95	1.98	1.99	1.64	1.89
Median	1.92	1.90	2.00	1.56	2.00
Minimum	1.00	1.00	1.00	1.13	1.14
Maximum	2.83	3.40	2.75	2.38	2.33
Std. Deviation	0.53	0.69	0.57	0.47	0.39
Von Humboldt-Reichers 1 (23)					
Count	22	22	22	22	22
Mean	2.20	2.15	2.52	1.82	2.12
Median	2.17	2.20	2.50	1.81	2.14
Minimum	1.00	1.20	1.38	1.00	1.00
Maximum	3.83	3.40	4.00	3.38	3.43
Std. Deviation	0.62	0.55	0.81	0.51	0.66
Von Humboldt-Reichers 2 (15) L*					
Count	12	12	12	12	12
Mean	2.54	2.15	2.78	2.05	2.49
Median	2.50	2.20	2.74	2.06	2.36
Minimum	1.83	1.00	1.38	1.50	1.71
Maximum	3.50	3.40	4.00	2.75	4.00
Std. Deviation	0.55	0.70	0.76	0.46	0.64

* L = Longitudinal students, whole class not in study.

Table C9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Von Humboldt-Reichers 3 (22)					
Count	20	20	20	20	20
Mean	2.29	2.11	2.76	2.06	2.19
Median	2.33	2.10	2.63	1.88	2.14
Minimum	1.83	1.20	1.63	1.00	1.57
Maximum	3.00	3.00	3.75	3.25	3.14
Std. Deviation	0.35	0.46	0.59	0.58	0.40
Von Humboldt-Waters 1 (16)					
Count	14	14	14	14	14
Mean	2.43	2.17	2.75	1.95	2.25
Median	2.50	2.30	2.69	1.88	2.15
Minimum	1.17	1.40	1.83	1.38	1.33
Maximum	3.67	3.20	3.88	2.75	3.43
Std. Deviation	0.62	0.49	0.69	0.44	0.58
Von Humboldt-Waters 2 (16)					
Count	10	10	10	10	10
Mean	2.15	2.25	2.38	1.95	2.10
Median	2.17	2.23	2.63	1.88	2.07
Minimum	1.00	1.00	1.13	1.25	1.71
Maximum	3.67	3.40	3.38	2.63	2.57
Std. Deviation	0.94	0.72	0.88	0.50	0.27
Von Humboldt-Waters 3 (11) L					
Count	10	10	10	10	10
Mean	2.10	2.08	2.76	2.04	2.39
Median	2.08	2.10	2.75	2.06	2.36
Minimum	1.50	1.20	1.50	1.00	1.43
Maximum	2.83	2.80	3.75	3.00	3.00
Std. Deviation	0.43	0.49	0.58	0.69	0.50

Table C9 *(continued)*

School-Class *(N)*		Subscale *(1 = very true; 4 = not true at all)*				
		Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
		–Conventional–				
Addams-Wolfe 1 (24)						
	Count	23	23	23	23	23
	Mean	1.92	1.81	2.09	1.68	1.88
	Median	1.83	1.60	2.13	1.50	1.86
	Minimum	1.00	1.00	1.00	1.00	1.00
	Maximum	3.00	3.40	4.00	2.63	3.71
	Std. Deviation	0.60	0.61	0.78	0.45	0.55
Addams-Wolfe 2 (28)						
	Count	25	25	25	25	25
	Mean	2.29	2.13	2.42	1.70	2.07
	Median	2.33	2.20	2.50	1.63	2.00
	Minimum	1.33	1.00	1.00	1.00	1.43
	Maximum	3.17	3.40	4.00	2.25	2.86
	Std. Deviation	0.49	0.56	0.78	0.32	0.40
Wacker-DiMatteo 1 (23)						
	Count	–	–	–	–	–
	Mean	–	–	–	–	–
	Median	–	–	–	–	–
	Minimum	–	–	–	–	–
	Maximum	–	–	–	–	–
	Std. Deviation	–	–	–	–	–

Table C10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 1, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Fernwood-Dunn (26)	24	1.54	26	1.58	25	2.60	26	1.23	26	1.23	26	1.85	26	2.46	26	2.65
Von Humboldt-Reichers (60)	53	1.72	54	1.93	54	2.43	54	1.35	53	1.23	53	1.92	53	2.17	53	2.77
Von Humboldt-Waters (43)	34	1.94	34	1.91	34	2.21	34	1.44	34	1.35	34	1.74	34	2.41	34	2.65
—Conventional—																
Addams-Wolfe (50)	48	1.48	48	1.58	48	2.21	47	1.43	48	1.19	48	1.50	48	1.96	48	2.81
Fernwood-Pimm (5)	5	1.40	5	1.40	5	2.00	5	1.20	5	1.20	4	1.75	5	1.80	5	2.20

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Fernwood-Dunn (26)	25	2.80	26	1.54	26	2.12	26	3.08	26	3.04	26	1.85	26	1.42	26	2.88
Von Humboldt-Reichers (60)	53	2.94	53	1.62	53	2.13	52	2.79	53	2.45	51	1.78	53	1.83	46	2.41
Von Humboldt-Waters (43)	34	2.97	33	1.58	34	2.00	34	2.76	34	2.24	34	1.88	34	1.88	25	2.28
—Conventional—																
Addams-Wolfe (50)	48	2.81	48	1.40	48	1.63	48	2.92	48	2.25	48	1.56	48	1.38	48	2.75
Fernwood-Pimm (5)	5	2.00	5	1.40	5	2.20	5	3.40	5	3.20	5	1.40	5	1.80	5	2.20

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table C11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 1

School-Class *(N)*	Item Number *(see Key)*																							
	3			**4**			**6**			**11**			**16**			**20**			**27**			**28**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Fernwood-Dunn 1 (16)	14	1.64	0.93	16	1.56	0.89	16	2.63	0.96	16	1.31	0.60	16	1.19	0.54	16	1.63	1.02	16	2.56	1.21	16	2.88	0.89
Fernwood-Dunn 2 (10)	10	1.40	0.52	10	1.60	0.70	9	2.56	1.13	10	1.10	0.32	10	1.30	0.67	10	2.20	1.32	10	2.30	0.95	10	2.30	1.06
Von Humboldt-Reichers 1 (23)	22	1.64	0.58	22	1.77	0.81	22	2.50	1.06	22	1.45	0.80	21	1.29	0.46	21	1.81	0.93	21	2.14	0.91	21	3.00	0.95
Von Humboldt-Reichers 2 (15) L*	12	2.08	0.79	12	1.92	1.16	12	2.33	0.89	12	1.42	0.51	12	1.08	0.29	12	2.08	1.08	12	1.83	1.03	12	2.42	1.08
Von Humboldt-Reichers 3 (22)	19	1.58	0.51	20	2.10	0.85	20	2.40	0.82	20	1.20	0.41	20	1.25	0.55	20	1.95	1.00	20	2.40	1.05	20	2.75	1.02
Von Humboldt-Waters 1 (16)	14	2.07	0.92	14	1.50	0.65	14	1.71	0.83	14	1.71	0.91	14	1.57	0.85	14	1.71	0.83	14	2.14	1.23	14	2.71	1.14
Von Humboldt-Waters 2 (16)	10	1.80	0.79	10	2.00	1.15	10	2.50	0.71	10	1.20	0.42	10	1.00	0.00	10	1.50	0.71	10	3.00	0.94	10	2.50	0.97
Von Humboldt-Waters 3 (11) L	10	1.90	0.57	10	2.40	1.17	10	2.60	1.07	10	1.30	0.48	10	1.40	0.70	10	2.00	0.82	10	2.20	1.03	10	2.70	1.16
—Conventional—																								
Addams-Wolfe 1 (24)	23	1.39	0.72	23	1.57	0.84	23	2.09	1.08	22	1.50	0.91	23	1.17	0.49	23	1.43	0.84	23	1.74	1.10	23	2.57	0.95
Addams-Wolfe 2 (26)	25	1.56	0.58	25	1.60	0.76	25	2.32	0.90	25	1.36	0.49	25	1.20	0.41	25	1.56	0.71	25	2.16	1.14	25	3.04	0.79
Fernwood-Pimm 1 (5)	5	1.40	0.55	5	1.40	0.55	5	2.00	1.00	5	1.20	0.45	5	1.20	0.45	4	1.75	0.96	5	1.80	0.84	5	2.20	0.84

School-Class *(N)*	**37**			**38**			**39**			**44**			**45**			**49**			**53**			**55**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Fernwood-Dunn 1 (16)	15	2.87	1.25	16	1.44	0.51	16	2.00	0.97	16	3.06	0.85	16	3.13	1.02	16	1.88	1.02	16	1.44	0.73	16	2.75	1.00
Fernwood-Dunn 2 (10)	10	2.70	0.82	10	1.70	0.48	10	2.30	0.67	10	3.10	0.88	10	2.90	0.99	10	1.80	1.03	10	1.40	0.52	10	3.10	0.32
Von Humboldt-Reichers 1 (23)	21	3.00	0.95	21	1.71	0.72	21	1.95	0.67	21	2.81	0.81	21	2.57	0.98	20	1.80	0.83	21	1.62	0.92	12	2.42	0.90
Von Humboldt-Reichers 2 (15) L	12	2.75	1.22	12	1.50	0.80	12	2.17	0.83	12	2.58	0.90	12	2.50	0.90	12	1.67	0.89	12	1.83	0.94	20	2.55	0.89
Von Humboldt-Reichers 3 (22)	20	3.00	0.92	20	1.60	0.82	20	2.30	0.92	19	2.89	0.81	20	2.30	0.98	19	1.84	1.07	20	2.05	0.89	14	2.21	1.25
Von Humboldt-Waters 1 (16)	14	2.86	0.95	14	1.43	0.76	14	1.93	0.92	14	2.71	0.99	14	1.93	0.73	14	1.71	0.99	14	1.86	0.95	10	1.80	0.79
Von Humboldt-Waters 2 (16)	10	3.00	1.05	9	1.78	0.67	10	1.60	0.84	10	2.50	1.27	10	2.20	0.79	10	1.90	1.29	10	1.50	0.85	10	2.80	0.92
Von Humboldt-Waters 3 (11) L	10	3.10	0.88	10	1.60	0.84	10	2.50	0.97	10	3.10	0.88	10	2.70	1.06	10	2.10	0.99	10	2.30	0.95	5	2.20	0.84
—Conventional—																								
Addams-Wolfe 1 (24)	23	2.61	0.89	23	1.43	0.79	23	1.52	0.67	23	2.74	0.86	23	2.04	0.98	23	1.57	0.79	23	1.30	0.56	23	2.65	0.83
Addams-Wolfe 2 (26)	25	3.00	1.04	25	1.36	0.49	25	1.72	0.94	25	3.08	0.81	25	2.44	1.00	25	1.56	0.82	25	1.44	0.58	25	2.84	0.90
Fernwood-Pimm 1 (5)	5	2.00	0.71	5	1.40	0.89	5	2.20	0.84	5	3.40	0.55	5	3.20	0.84	5	1.40	0.55	5	1.80	0.84	5	2.20	0.84

* L = Longitudinal students, whole class not in study.

Table C11 *(continued)*

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table C12

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 1

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Fernwood-Dunn 1 (16)	16	3.94	16	2.80	16	1.38	16	3.38	16	3.75	16	2.56	16	1.94	16	3.06
Fernwood-Dunn 2 (10)	10	3.90	10	2.50	10	1.30	10	2.80	10	3.60	10	3.40	10	2.50	10	3.40
Von Humboldt-Reichers 1 (23)	22	3.73	22	2.86	22	1.43	22	2.90	22	3.57	22	3.14	22	1.86	22	3.48
Von Humboldt-Reichers 2 (15) L*	12	3.75	12	2.92	12	1.75	12	3.00	12	3.33	12	2.33	12	1.91	12	3.58
Von Humboldt-Reichers 3 (22)	20	3.85	20	3.05	20	1.50	20	3.25	20	3.45	20	2.75	20	1.75	20	3.35
Von Humboldt-Waters 1 (16)	14	3.57	14	2.79	14	1.36	14	3.07	14	3.71	14	2.71	14	2.36	14	3.71
Von Humboldt-Waters 2 (16)	10	3.70	10	2.50	10	1.70	10	3.30	10	3.80	10	2.90	10	2.10	10	3.10
Von Humboldt-Waters 3 (11) L	10	3.90	10	2.40	10	1.60	10	2.90	10	3.40	10	2.90	10	2.10	10	3.11
–Conventional–																
Addams-Wolfe 1 (24)	23	3.70	23	2.48	23	1.17	23	3.35	23	3.65	23	3.39	23	1.91	23	3.48
Addams-Wolfe 2 (26)	25	3.76	25	2.88	25	1.36	25	3.24	25	3.72	25	2.88	25	1.44	25	3.68
Fernwood-Pimm 1 (5)	5	3.40	5	2.20	5	1.40	5	3.20	5	3.20	5	2.80	5	2.40	5	3.60

* L = Longitudinal students, whole class not in study.

Table C13

Student Preference Ranking of Classes in District 1, Grade 8

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—							
Fernwood-Dunn 1 (16)	15	0	20	13	0	0	13	7	47	0	0
Fernwood-Dunn 2 (10)	10	0	0	20	0	0	10	10	60	0	0
Von Humboldt-Reichers 1 (23)	23	26	9	13	0	9	0	0	13	4	26
Von Humboldt-Reichers 2 (15) L[2]	12	17	0	0	8	0	0	0	17	17	42
Von Humboldt-Reichers 3 (22)	22	27	0	5	0	5	9	14	9	9	23
Von Humboldt-Waters 1 (16)	14	14	7	7	0	0	0	7	29	21	14
Von Humboldt-Waters 2 (16)	14	36	7	7	0	0	7	0	21	7	14
Von Humboldt-Waters 3 (11) L[3]	11	--	--	--	--	--	--	--	--	--	--
				—Conventional—							
Addams-Wolfe 1 (24)	23	0	26	17	0	4	9	13	4	0	26
Addams-Wolfe 2 (26)	25	0	12	12	0	0	16	8	4	0	48
Fernwood-Pimm 1 (5)	5	0	20	0	0	0	0	0	80	0	0

[1] Other includes mutiple preferences.

[2] L = Longitudinal students, whole class not in study.

[3] Preference data were unavailable.

Note: Response rates designate class mean percents.

Table C14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 1

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— MiC —															
Fernwood-Dunn 1 (16)	15	7	73	20	0	15	7	27	60	7	15	33	40	13	13
Fernwood-Dunn 2 (10)	10	20	60	10	10	10	20	50	30	0	10	20	30	40	10
Von Humboldt-Reichers 1 (23)	23	35	39	22	4	23	13	35	39	13	23	35	52	4	9
Von Humboldt-Reichers 2 (15) L*	11	27	54	9	9	11	9	45	45	0	11	45	36	18	0
Von Humboldt-Reichers 3 (22)	20	15	65	20	0	21	43	43	5	0	20	40	35	15	10
Von Humboldt-Waters 1 (16)	14	28	43	21	7	14	14	43	29	14	14	21	50	7	21
Von Humboldt-Waters 2 (16)	14	29	50	14	7	14	7	50	36	7	14	43	36	14	7
Von Humboldt-Waters 3 (11) L	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
—Conventional —															
Addams-Wolfe 1 (24)	23	22	57	13	9	23	4	35	30	30	23	30	48	13	9
Addams-Wolfe 2 (26)	25	36	52	4	8	25	12	40	32	16	25	48	28	12	12
Fernwood-Pimm 1 (5)	5	0	80	20	0	5	0	60	0	40	5	0	20	60	20

* L = Longitudinal students, whole class not in study.

Note: Response rates designate class mean percents.

APPENDIX D

GRADE 7, DISTRICT 2

Table D1

Fixed Characteristics for Seventh-Grade Classes in District 2

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* *(self-identified)*		Ethnicity *(%)* *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
—MiC—													
Guggenheim-Broughton 1 (9)	4	5	100	0	44	11	22	0	0	22	0	0	0
Guggenheim-Broughton 2 (5) L***	2	3	100	0	20	40	40	0	0	0	0	0	0
Guggenheim-Broughton 3 (2) L	1	1	100	0	50	50	0	0	0	0	0	0	0
Guggenheim-Redling 1 (11) L	7	4	100	0	20	10	50	0	0	20	0	0	0
Guggenheim-Redling 2 (8) L	6	2	88	0	0	75	25	0	0	0	0	0	0
Guggenheim-Redling 3 (8)	4	4	100	0	13	25	25	0	0	13	0	25	0
Guggenheim-Redling 4 (6)	3	3	83	0	17	17	33	0	17	17	0	0	0
Guggenheim-Redling 5 (4) L	4	0	100	0	0	75	25	0	0	0	0	0	0
Weir-Flader 1 (9)	5	4	100	0	67	0	0	0	0	22	11	0	0
Weir-Flader 2 (10)	9	1	100	0	40	10	0	10	0	30	0	10	0
—Conventional—													
Von Steuben-Friedman 1 (13)	6	7	77	8	8	23	54	0	0	15	0	0	0
Von Steuben-Friedman 2 (13)	8	5	85	0	0	23	31	0	0	38	0	0	8

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** L = Longitudinal students, whole class not in study.

Table D2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 2

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
—MiC—													
Guggenheim-Broughton 1 (1)	0	1	100	0	0	0	0	0	0	100	0	0	0
Guggenheim-Broughton 3 (1)	1	0	100	0	0	100	0	0	0	0	0	0	0
Guggenheim-Redling 1 (4)	3	1	100	0	0	0	100	0	0	0	0	0	0
Guggenheim-Redling 2 (2)	1	1	100	0	0	50	50	0	0	0	0	0	0
Guggenheim-Redling 4 (1)	1	0	0	0	0	0	0	0	0	100	0	0	0
Guggenheim-Redling 5 (2)	2	0	100	0	0	100	0	0	0	0	0	0	0
—Conventional—													
Von Steuben-Friedman 1 (10)	6	4	70	10	10	20	60	0	0	10	0	0	0
Von Steuben-Friedman 2 (8)	4	4	88	0	0	13	38	0	0	25	0	0	25
Longitudinal Years 2 & 3													
—MiC—													
Guggenheim-Broughton 1 (8)	5	3	100	0	50	13	25	0	0	13	0	0	0
Guggenheim-Broughton 2 (5)	2	3	100	0	20	40	40	0	0	0	0	0	0
Guggenheim-Broughton 3 (1)	0	1	100	0	100	0	0	0	0	0	0	0	0
Guggenheim-Redling 1 (7)	4	3	100	0	29	14	29	0	0	29	0	0	0
Guggenheim-Redling 2 (6)	5	1	83	0	0	83	17	0	0	0	0	0	0
Guggenheim-Redling 3 (8)	4	4	100	0	13	25	25	0	0	13	0	25	0
Guggenheim-Redling 4 (5)	2	3	100	0	20	20	40	0	20	0	0	0	0
Guggenheim-Redling 5 (2)	2	0	100	0	0	50	50	0	0	0	0	0	0
Weir-Flader 1 (9)	5	4	100	0	67	0	0	0	0	22	11	0	0
Weir-Flader 2 (10)	9	1	100	0	40	10	0	10	0	30	0	10	0
—Conventional—													
Von Steuben-Friedman 1 (3)	0	3	100	0	0	33	33	0	0	33	0	0	0
Von Steuben-Friedman 2 (5)	4	1	80	0	0	40	0	0	0	60	0	0	8

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table D3

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 2

School-Class *(N)*	SAT National Percentile					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
		—MiC—				
Guggenheim-Broughton 1 (9)	9	33.67	13.96	6	37.0	51
Guggenheim-Broughton 2 (5) L*	4	37.25	14.64	21	37.0	54
Guggenheim-Broughton 3 (2) L	2	56.50	-	55	56.5	58
Guggenheim-Redling 1 (11) L	10	59.20	19.47	30	66.0	91
Guggenheim-Redling 2 (8) L	8	83.88	19.31	40	91.0	98
Guggenheim-Redling 3 (8)	6	80.83	12.83	58	82.5	94
Guggenheim-Redling 4 (6)	6	63.83	31.15	24	69.5	96
Guggenheim-Redling 5 (4) L	3	53.00	-	24	62.0	73
Weir-Flader 1 (9)	8	29.25	23.19	10	21.0	66
Weir-Flader 2 (10)	9	63.44	18.00	33	69.0	81
		—Conventional—				
Von Steuben-Friedman 1 (13)	13	59.92	21.90	9	68.0	82
Von Steuben-Friedman 2 (13)	11	57.27	28.09	18	54.0	98

* L = Longitudinal students, whole class not in study.

Table D4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 2

School-Class *(N)*	SAT National Percentile					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
Longitudinal Years 1, 2, & 3						
			—MiC—			
Guggenheim-Broughton 1 (1)	1	51.00	-	51	51.0	51
Guggenheim-Broughton 3 (1)	1	58.00	-	58	58.0	58
Guggenheim-Redling 1 (4)	4	46.75	18.55	30	44.0	69
Guggenheim-Redling 2 (2)	2	64.00	33.94	40	64.0	88
Guggenheim-Redling 4 (1)	1	30.00	-	30	30.0	30
Guggenheim-Redling 5 (2)	2	67.50	7.78	62	67.5	73
			—Conventional—			
Von Steuben-Friedman 1 (10)	10	59.70	22.17	9	69.5	82
Von Steuben-Friedman 2 (8)	6	69.50	26.88	36	69.5	98
Longitudinal Years 2 & 3						
			—MiC—			
Guggenheim-Broughton 1 (8)	8	31.50	13.21	6	33.5	47
Guggenheim-Broughton 2 (5)	4	37.25	14.64	21	37.0	54
Guggenheim-Broughton 3 (1)	1	55.00	-	55	55.0	55
Guggenheim-Redling 1 (6)	6	67.50	16.40	40	67.5	91
Guggenheim-Redling 2 (6)	6	90.50	9.01	73	92.5	98
Guggenheim-Redling 3 (8)	6	80.83	12.83	58	82.5	94
Guggenheim-Redling 4 (5)	5	70.60	29.49	24	77.0	96
Guggenheim-Redling 5 (2)	1	24.00	-	24	24.0	24
Weir-Flader 1 (9)	8	29.25	23.19	10	21.0	66
Weir-Flader 2 (10)	9	63.44	18.00	33	69.0	81
			—Conventional—			
Von Steuben-Friedman 1 (3)	3	60.67	25.79	32	68.0	82
Von Steuben-Friedman 2 (5)	5	42.60	24.02	18	46.0	75

Table D5

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 2

School-Class *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
		—MiC—			
Guggenheim-Broughton 1 (9)	8	2.75	0.63	0.00	0.00
Guggenheim-Broughton 2 (5) L*	3	3.67	1.00	0.33	0.00
Guggenheim-Broughton 3 (2) L	2	4.50	2.00	0.00	0.00
Guggenheim-Redling 1 (11) L	7	3.57	0.86	0.00	0.00
Guggenheim-Redling 2 (8) L	8	4.00	2.13	1.00	0.13
Guggenheim-Redling 3 (8)	6	3.00	2.00	0.67	0.00
Guggenheim-Redling 4 (6)	4	2.75	1.25	0.25	0.00
Guggenheim-Redling 5 (4) L	4	3.50	1.75	0.25	0.00
Weir-Flader 1 (9)	8	3.00	0.88	0.00	0.00
Weir-Flader 2 (10)	7	3.86	1.43	0.29	0.00
		—Conventional—			
Von Steuben-Friedman 1 (13)	10	2.80	0.70	0.00	0.00
Von Steuben-Friedman 2 (13)	8	1.50	0.75	0.38	0.00

* L = Longitudinal students, whole class not in study.

Table D6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 2

School-Class *(N)*		Level of Student Performance								
	(N)	**Prestructural** *(%)*	**Unistructural** *(%)*	**Ave.**	**Multistructural** *(%)*	**Ave.**	**Relational** *(%)*	**Ave.**	**Extended Abstract** *(%)*	**Ave.**	**No Response** *(%)*
—MiC—											
Guggenheim-Broughton 1 (9)	8			2.75		0.63		0.00		0.00	
Number		12.50%	87.50%		0.00%		0.00%		0.00%		0.00%
Algebra		37.50%	62.50%		0.00%		0.00%		0.00%		0.00%
Space		37.50%	37.50%		25.00%		0.00%		0.00%		0.00%
Measurement		50.00%	12.50%		37.50%		0.00%		0.00%		0.00%
Chance&Data		75.00%	12.50%		0.00%		0.00%		0.00%		12.50%
Guggenheim-Broughton 2 (5) L*	3			3.67		1.00		0.33		0.00	
Number		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	0.00%		66.67%		0.00%		0.00%		0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		0.00%		33.33%		0.00%		0.00%
Guggenheim-Broughton 3 (2) L	2			4.50		2.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	50.00%		50.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Guggenheim-Redling 1 (11) L	7			3.57		0.86		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		28.57%	71.43%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	14.29%		85.71%		0.00%		0.00%		0.00%
Measurement		57.14%	42.86%		0.00%		0.00%		0.00%		0.00%
Chance&Data		57.14%	42.86%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Redling 2 (8) L	8			4.00		2.13		1.00		0.13	
Number		0.00%	62.50%		25.00%		12.50%		0.00%		0.00%
Algebra		12.50%	87.50%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	12.50%		12.50%		62.50%		12.50%		0.00%
Measurement		25.00%	0.00%		75.00%		0.00%		0.00%		0.00%
Chance&Data		62.50%	25.00%		0.00%		12.50%		0.00%		0.00%

* L = Longitudinal students, whole class not in study.

Table D6 *(continued)*

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
Guggenheim-Redling 3 (8)	6			3.00		2.00		0.67		0.00	
Number		33.33%	33.33%		16.67%		16.67%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		66.67%		33.33%		0.00%		0.00%
Measurement		33.33%	0.00%		50.00%		16.67%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Redling 4 (6)	4			2.75		1.25		0.25		0.00	
Number		0.00%	75.00%		25.00%		0.00%		0.00%		0.00%
Algebra		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Space		25.00%	25.00%		25.00%		25.00%		0.00%		0.00%
Measurement		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Redling 5 (4) L	4			3.50		1.75		0.25		0.00	
Number		0.00%	75.00%		0.00%		25.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	25.00%		75.00%		0.00%		0.00%		0.00%
Measurement		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Chance&Data		50.00%	25.00%		25.00%		0.00%		0.00%		0.00%
Weir-Flader 1 (9)	8			3.00		0.88		0.00		0.00	
Number		12.50%	75.00%		12.50%		0.00%		0.00%		0.00%
Algebra		37.50%	62.50%		0.00%		0.00%		0.00%		0.00%
Space		25.00%	37.50%		37.50%		0.00%		0.00%		0.00%
Measurement		37.50%	25.00%		37.50%		0.00%		0.00%		0.00%
Chance&Data		87.50%	12.50%		0.00%		0.00%		0.00%		0.00%
Weir-Flader 2 (10)	7			3.86		1.43		0.29		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		14.29%	85.71%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	28.57%		42.86%		28.57%		0.00%		0.00%
Measurement		14.29%	14.29%		71.43%		0.00%		0.00%		0.00%
Chance&Data		85.71%	14.29%		0.00%		0.00%		0.00%		0.00%

Table D6 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
—Conventional—											
Von Steuben-Friedman 1 (13)	10			2.80		0.70		0.00		0.00	
Number		10.00%	70.00%		0.00%		0.00%		0.00%		20.00%
Algebra		10.00%	80.00%		0.00%		0.00%		0.00%		10.00%
Space		40.00%	10.00%		40.00%		0.00%		0.00%		10.00%
Measurement		20.00%	40.00%		30.00%		0.00%		0.00%		10.00%
Chance&Data		60.00%	10.00%		0.00%		0.00%		0.00%		30.00%
Von Steuben-Friedman 2 (13)	8			1.50		0.75		0.38		0.00	
Number		12.50%	25.00%		0.00%		25.00%		0.00%		37.50%
Algebra		12.50%	50.00%		0.00%		0.00%		0.00%		37.50%
Space		37.50%	0.00%		12.50%		12.50%		0.00%		37.50%
Measurement		37.50%	0.00%		25.00%		0.00%		0.00%		37.50%
Chance&Data		37.50%	0.00%		0.00%		0.00%		0.00%		62.50%

Table D7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Seventh-Grade Classes in District 2

School-Class *(N)*		Level of Student Performance								
	(N)	**Prestructural** *(%)*	**Unistructural** *(%)*	**Ave.**	**Multistructural** *(%)*	**Ave.**	**Relational** *(%)*	**Ave.**	**Extended Abstract** *(%)*	**No Response** *(%)*
LONGITUDINAL IN YEARS 1, 2, & 3										
					—MiC—					
Guggenheim-Broughton 1 (1)	1			4.00		2.00		0.00	0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%	0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%	0.00%
Chance&Data		0.00%	0.00%		0.00%		0.00%		0.00%	100.00%
Guggenheim-Broughton 3 (1)	1			4.00		1.00		0.00	0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Space		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%	0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Guggenheim-Redling 1 (4)	4			4.25		0.75		0.00	0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%	0.00%
Space		0.00%	25.00%		75.00%		0.00%		0.00%	0.00%
Measurement		25.00%	75.00%		0.00%		0.00%		0.00%	0.00%
Chance&Data		25.00%	75.00%		0.00%		0.00%		0.00%	0.00%
Guggenheim-Redling 2 (6)	2			3.50		1.50		0.50	0.00	
Number		0.00%	50.00%		0.00%		50.00%		0.00%	0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Space		0.00%	50.00%		50.00%		0.00%		0.00%	0.00%
Measurement		50.00%	0.00%		50.00%		0.00%		0.00%	0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Guggenheim-Redling 4 (1)	1			2.00		0.00		0.00	0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Algebra		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Space		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Chance&Data		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Guggenheim-Redling 5 (2)	2			3.00		1.50		0.50	0.00	
Number		0.00%	50.00%		0.00%		50.00%		0.00%	0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%	0.00%
Space		0.00%	50.00%		50.00%		0.00%		0.00%	0.00%
Measurement		50.00%	0.00%		50.00%		0.00%		0.00%	0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%

Table D7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural *(%)*	**Unistructural** *(%)*	**Ave.**	**Multistructural** *(%)*	**Ave.**	**Relational** *(%)*	**Ave.**	**Extended Abstract** *(%)*	**Ave.**	**No Response** *(%)*
					—Conventional—						
Von Steuben-Friedman 1 (10)	10			2.80		0.70		0.00		0.00	
Number		10.00%	70.00%		0.00%		0.00%		0.00%		20.00%
Algebra		10.00%	80.00%		0.00%		0.00%		0.00%		10.00%
Space		40.00%	10.00%		40.00%		0.00%		0.00%		10.00%
Measurement		20.00%	40.00%		30.00%		0.00%		0.00%		10.00%
Chance&Data		60.00%	10.00%		0.00%		0.00%		0.00%		30.00%
Von Steuben-Friedman 2 (8)	8			1.50		0.75		0.38		0.00	
Number		12.50%	25.00%		0.00%		25.00%		0.00%		37.50%
Algebra		12.50%	50.00%		0.00%		0.00%		0.00%		37.50%
Space		37.50%	0.00%		12.50%		12.50%		0.00%		37.50%
Measurement		37.50%	0.00%		25.00%		0.00%		0.00%		37.50%
Chance&Data		37.50%	0.00%		0.00%		0.00%		0.00%		62.50%
LONGITUDINAL IN YEARS 2 & 3											
					—MiC—						
Guggenheim-Broughton 1 (8)	7			2.57		0.43		0.00		0.00	
Number		14.29%	85.71%		0.00%		0.00%		0.00%		0.00%
Algebra		42.86%	57.14%		0.00%		0.00%		0.00%		0.00%
Space		42.86%	42.86%		14.29%		0.00%		0.00%		0.00%
Measurement		57.14%	14.29%		28.57%		0.00%		0.00%		0.00%
Chance&Data		85.71%	14.29%		0.00%		0.00%		0.00%		100.00%
Guggenheim-Broughton 2 (5)	3			3.67		1.00		0.33		0.00	
Number		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	0.00%		66.67%		0.00%		0.00%		0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		0.00%		33.33%		0.00%		0.00%
Guggenheim-Broughton 3 (1)	1			5.00		3.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%

Table D7 *(continued)*

School-Class *(N)*	Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
Guggenheim-Redling 1 (6)	3			2.67		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		66.67%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		66.67%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		33.33%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		66.67%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		33.33%		33.33%
Guggenheim-Redling 2 (6)	6			4.17		2.33		1.17		0.17	
Number		0.00%	66.67%		33.33%		0.00%		0.00%		0.00%
Algebra		16.67%	83.33%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		0.00%		83.33%		16.67%		0.00%
Measurement		16.67%	0.00%		83.33%		0.00%		0.00%		0.00%
Chance&Data		50.00%	33.33%		0.00%		16.67%		0.00%		0.00%
Guggenheim-Redling 3 (8)	6			3.00		2.00		0.67		0.00	
Number		33.33%	33.33%		16.67%		16.67%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		66.67%		33.33%		0.00%		0.00%
Measurement		33.33%	0.00%		50.00%		16.67%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Redling 4 (5)	3			3.00		1.67		0.33		0.00	
Number		0.00%	66.67%		33.33%		0.00%		0.00%		0.00%
Algebra		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	33.33%		33.33%		33.33%		0.00%		0.00%
Measurement		33.33%	0.00%		66.67%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Redling 5 (2)	2			4.00		2.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		50.00%	0.00%		50.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	50.00%		50.00%		0.00%		0.00%		0.00%
Weir-Flader 1 (9)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-

Table D7 *(continued)*

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Unistructural Ave.	Multistructural *(%)*	Multistructural Ave.	Relational *(%)*	Relational Ave.	Extended Abstract *(%)*	Extended Abstract Ave.	No Response *(%)*
Weir-Flader 2 (10)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
—Conventional—											
Von Steuben-Friedman 1 (3)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Von Steuben-Friedman 2 (5)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-

Table D8

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 2

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Guggenheim-Broughton 1 (9)	9	2.00	9	2.06	9	2.21	9	2.01	9	2.03
Guggenheim-Broughton 2 (5) L*	4	1.83	4	1.55	4	2.06	4	1.84	4	1.71
Guggenheim-Broughton 3 (2) L	2	1.50	2	1.83	2	2.89	2	1.56	2	2.14
Guggenheim-Redling 1 (11) L	10	2.13	10	2.22	10	2.49	10	1.78	10	2.16
Guggenheim-Redling 2 (8) L	8	2.11	8	1.85	8	2.70	8	2.00	8	2.29
Guggenheim-Redling 3 (8)	7	2.29	7	1.97	7	2.66	7	2.27	7	2.16
Guggenheim-Redling 4 (6)	5	1.83	5	1.64	5	1.85	5	1.35	5	1.80
Guggenheim-Redling 5 (4) L	4	2.29	4	2.10	4	2.56	4	1.72	4	2.21
Weir-Flader 1 (9)	9	2.07	9	1.91	9	1.99	9	1.85	9	1.98
Weir-Flader 2 (10)	6	1.72	6	1.67	6	1.75	6	1.42	6	1.77
–Conventional–										
Von Steuben-Friedman 1 (13)	11	1.77	11	1.60	11	1.41	11	1.45	11	1.78
Von Steuben-Friedman 2 (13)	5	2.03	5	1.96	5	1.78	5	1.78	5	1.43

* L = Longitudinal students, whole class not in study.

Table D9

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 2

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
–MiC–					
Guggenheim-Broughton 1 (9)					
Count	9	9	9	9	9
Mean	2.00	2.06	2.21	2.01	2.03
Median	1.83	2.20	2.38	2.25	2.00
Minimum	1.00	1.20	1.00	1.00	1.67
Maximum	3.33	2.60	3.25	2.75	2.57
Std. Deviation	0.73	0.53	0.65	0.63	0.33
Guggenheim-Broughton 2 (5) L*					
Count	4	4	4	4	4
Mean	1.83	1.55	2.06	1.84	1.71
Median	1.83	1.60	1.94	1.94	1.79
Minimum	1.33	1.00	1.38	1.13	1.29
Maximum	2.33	2.00	3.00	2.38	2.00
Std. Deviation	0.58	0.53	0.68	0.52	0.35
Guggenheim-Broughton 3 (2)					
Count	2	2	2	2	2
Mean	1.50	1.83	2.89	1.56	2.14
Median	1.50	1.83	2.89	1.56	2.14
Minimum	1.50	1.67	2.40	1.38	2.00
Maximum	1.50	2.00	3.38	1.75	2.29
Std. Deviation	0.00	0.24	0.69	0.27	0.20
Guggenheim-Redling 1 (11) L					
Count	10	10	10	10	10
Mean	2.13	2.22	2.49	1.78	2.16
Median	1.92	2.30	2.50	1.63	2.14
Minimum	1.33	1.20	1.50	1.14	1.43
Maximum	3.17	3.00	3.88	2.88	3.00
Std. Deviation	0.67	0.64	0.80	0.52	0.54
Guggenheim-Redling 2 (8) L					
Count	8	8	8	8	8
Mean	2.11	1.85	2.70	2.00	2.29
Median	2.20	2.00	2.56	1.88	2.14
Minimum	1.50	1.00	2.00	1.00	1.86
Maximum	2.67	2.60	3.75	3.13	2.86
Std. Deviation	0.46	0.50	0.61	0.69	0.41

* L = Longitudinal students, whole class not in study.

Table D9 *(continued)*

School-Class *(N)*		Subscale *(1 = very true; 4 = not true at all)*				
		Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Guggenheim-Redling 3 (8)						
	Count	7	7	7	7	7
	Mean	2.29	1.97	2.66	2.27	2.16
	Median	2.33	2.00	2.38	2.38	2.00
	Minimum	1.50	1.40	1.75	1.38	1.43
	Maximum	3.33	2.60	3.50	3.25	3.00
	Std. Deviation	0.66	0.45	0.64	0.64	0.60
Guggenheim-Redling 4 (6)						
	Count	5	5	5	5	5
	Mean	1.83	1.64	1.85	1.35	1.80
	Median	1.67	1.60	1.88	1.25	1.57
	Minimum	1.17	1.00	1.13	1.13	1.43
	Maximum	2.83	2.60	2.50	1.63	2.86
	Std. Deviation	0.68	0.59	0.55	0.25	0.60
Guggenheim-Redling 5 (4) L						
	Count	4	4	4	4	4
	Mean	2.29	2.10	2.56	1.72	2.21
	Median	2.33	2.20	2.50	1.75	2.21
	Minimum	1.67	1.40	2.25	1.38	2.00
	Maximum	2.83	2.60	3.00	2.00	2.43
	Std. Deviation	0.50	0.50	0.38	0.33	0.18
Weir-Flader 1 (9)						
	Count	9	9	9	9	9
	Mean	2.07	1.91	1.99	1.85	1.98
	Median	2.00	2.00	2.00	1.88	2.14
	Minimum	1.00	1.00	1.13	1.00	1.43
	Maximum	3.00	2.80	3.00	2.88	2.29
	Std. Deviation	0.69	0.61	0.75	0.61	0.30
Weir-Flader 2 (10)						
	Count	6	6	6	6	6
	Mean	1.72	1.67	1.75	1.42	1.77
	Median	1.83	1.70	1.81	1.31	1.71
	Minimum	1.00	1.00	1.00	1.00	1.00
	Maximum	2.33	2.60	2.75	2.00	2.43
	Std. Deviation	0.53	0.56	0.64	0.38	0.52

Table D9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
–Conventional–					
Von Steuben-Friedman 1 (13)					
Count	11	11	11	11	11
Mean	1.77	1.60	1.41	1.45	1.78
Median	1.83	1.60	1.25	1.38	1.86
Minimum	1.00	1.00	1.00	1.00	1.14
Maximum	2.50	2.20	2.13	2.50	2.33
Std. Deviation	0.51	0.41	0.41	0.42	0.43
Von Steuben-Friedman 2 (13)					
Count	5	5	5	5	5
Mean	2.03	1.96	1.78	1.78	1.43
Median	2.00	2.20	1.63	1.75	1.43
Minimum	1.83	1.40	1.38	1.38	1.00
Maximum	2.50	2.40	2.25	2.25	2.00
Std. Deviation	0.27	0.52	0.45	0.41	0.44

Table D10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 2, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Guggenheim-Broughton (16)	15	1.60	15	1.40	15	2.60	14	1.07	15	1.27	15	1.87	14	2.86	15	2.73
Guggenheim-Redling (37)	34	1.88	34	1.94	33	2.55	33	1.45	34	1.38	34	1.74	34	2.18	33	3.06
Weir-Flader (19)	15	1.87	14	2.00	15	2.53	15	1.40	15	1.27	15	1.80	15	2.20	15	2.07
—Conventional—																
Von Steuben-Friedman (26)	16	1.31	16	1.75	16	2.63	16	1.19	16	1.25	16	1.69	16	2.19	16	2.31

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Guggenheim-Broughton (16)	14	3.14	14	1.64	14	2.57	14	3.29	14	3.14	14	2.71	14	1.50	22	3.14
Guggenheim-Redling (37)	34	2.44	33	1.45	34	1.76	34	3.12	34	2.76	34	1.68	34	1.44	37	2.81
Weir-Flader (19)	15	2.40	15	1.80	15	2.47	15	3.73	15	3.13	15	1.93	14	1.57	20	3.30
—Conventional—																
Von Steuben-Friedman (26)	16	2.19	16	1.56	16	2.38	16	3.19	16	3.19	16	1.56	16	1.44	17	3.12

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table D11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 2

School-Class *(N)*	Item Number *(see Key)*																							
	3			4			6			11			16			20			27			28		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
—MiC—																								
Guggenheim-Broughton 1 (9)	9	1.44	0.53	9	1.33	0.71	9	2.56	0.88	8	1.00	0.00	9	1.33	0.50	9	2.22	1.09	9	2.44	0.88	9	2.67	1.22
Guggenheim-Broughton 2 (5) L*	4	1.50	1.00	4	1.00	0.00	4	3.50	0.58	4	1.00	0.00	4	1.25	0.50	4	1.50	1.00	4	3.75	0.50	4	2.50	0.58
Guggenheim-Broughton 3 (2) L	2	2.50	0.71	2	2.50	0.71	2	1.00	0.00	2	1.50	0.71	2	1.00	0.00	2	1.00	0.00	1	3.00	.	2	3.50	0.71
Guggenheim-Redling 1 (11) L	10	2.00	0.94	10	1.80	1.03	9	2.56	0.73	10	1.50	0.71	10	1.30	0.48	10	1.70	0.67	10	2.10	1.10	9	3.11	0.78
Guggenheim-Redling 2 (8) L	8	1.88	0.64	8	2.13	0.99	8	2.88	0.64	8	1.25	0.46	8	1.38	0.52	8	1.63	0.92	8	1.88	0.99	8	3.00	1.07
Guggenheim-Redling 3 (8)	7	2.14	0.69	7	1.57	0.79	7	2.71	0.76	6	2.17	1.17	7	1.29	0.49	7	1.86	0.69	7	2.29	0.76	7	2.86	1.07
Guggenheim-Redling 4 (6)	5	1.20	0.45	5	1.80	0.45	5	2.20	1.30	5	1.00	0.00	5	1.20	0.45	5	2.00	1.41	5	1.60	1.34	5	3.00	0.71
Guggenheim-Redling 5 (4) L	4	2.00	0.82	4	2.75	0.50	4	2.00	0.82	4	1.25	0.50	4	2.00	1.41	4	1.50	0.58	4	3.50	1.00	4	3.50	1.00
Weir-Flader 1 (9)	6	2.00	1.26	6	1.83	0.75	6	2.00	0.89	6	1.33	0.52	6	1.00	0.00	6	1.50	0.55	6	2.33	1.03	6	1.83	0.98
Weir-Flader 2 (10)	9	1.78	1.09	8	2.13	1.13	9	2.89	1.27	9	1.44	1.01	9	1.44	0.73	9	2.00	1.22	9	2.11	1.27	9	2.22	1.20
—Conventional—																								
Von Steuben-Friedman 1 (13)	5	1.60	0.89	5	2.00	1.41	5	2.20	0.45	5	1.20	0.45	5	1.40	0.55	5	1.60	1.34	5	2.40	0.89	5	2.80	1.10
Von Steuben-Friedman 2 (13)	11	1.18	0.40	11	1.64	0.81	11	2.82	1.08	11	1.18	0.60	11	1.18	0.40	11	1.73	0.90	11	2.09	1.14	11	2.09	0.94

School-Class *(N)*	37			38			39			44			45			49			53			55		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
—MiC—																								
Guggenheim-Broughton 1 (9)	9	3.00	1.12	9	1.33	0.71	9	2.67	1.12	9	3.22	0.97	9	3.11	0.78	9	2.67	1.32	9	1.67	1.00	9	3.33	0.87
Guggenheim-Broughton 2 (5) L	4	3.50	1.00	4	2.50	0.58	4	2.75	1.26	4	3.50	0.58	4	3.25	0.96	4	3.25	0.96	4	1.25	0.50	4	2.50	1.00
Guggenheim-Broughton 3 (2) L	1	3.00	.	1	1.00	.	1	1.00	.	1	3.00	.	1	3.00	.	1	1.00	.	1	1.00	.	9	3.22	0.83
Guggenheim-Redling 1 (11) L	10	2.80	1.03	10	1.60	0.52	10	2.10	0.74	10	3.50	0.53	10	2.90	0.99	10	2.10	0.99	10	1.70	0.95	8	3.13	0.83
Guggenheim-Redling 2 (8) L	8	2.38	0.74	8	1.63	0.52	8	1.63	0.52	8	2.75	0.89	8	3.00	1.31	8	1.50	0.76	8	1.63	0.74	5	3.00	1.22
Guggenheim-Redling 3 (8)	7	2.14	1.07	7	1.43	0.53	7	1.43	0.53	7	3.00	0.58	7	2.29	0.76	7	1.71	1.11	7	1.43	0.53	13	2.77	1.24
Guggenheim-Redling 4 (6)	5	2.00	1.41	5	1.00	0.00	5	2.00	1.00	5	3.40	0.89	5	3.00	1.22	5	1.00	0.00	5	1.00	0.00	4	2.50	0.58
Guggenheim-Redling 5 (4) L	4	2.75	1.26	3	1.33	0.58	4	1.50	0.58	4	2.75	0.96	4	2.50	0.58	4	1.75	0.50	4	1.00	0.00	7	2.57	0.79
Weir-Flader 1 (9)	6	1.83	1.17	6	1.17	0.41	6	2.67	1.03	6	3.67	0.52	6	3.00	1.26	6	1.83	1.17	5	1.80	1.30	9	3.33	0.50
Weir-Flader 2 (10)	9	2.78	1.09	9	2.22	1.30	9	2.33	1.00	9	3.78	0.44	9	3.22	0.97	9	2.00	1.00	9	1.44	0.53	11	3.27	0.65
—Conventional—																								
Von Steuben-Friedman 1 (13)	5	2.80	0.84	5	1.40	0.55	5	2.40	0.89	5	3.00	1.22	5	3.00	0.71	5	1.20	0.45	5	1.20	0.45	11	2.91	1.22
Von Steuben-Friedman 2 (13)	11	1.91	1.22	11	1.64	1.03	11	2.36	0.67	11	3.27	0.65	11	3.27	0.65	11	1.73	0.90	11	1.55	1.04	6	3.50	0.84

* L = Longitudinal students, whole class not in study.

Table D11 *(continued)*

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table D12

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 2

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Guggenheim-Broughton 1 (9)	9	2.89	9	1.63	9	1.56	9	3.44	9	3.89	9	2.78	9	1.67	9	3.33
Guggenheim-Broughton 2 (5) L*	4	3.75	4	1.75	4	1.50	4	3.50	4	3.75	4	3.00	4	2.00	4	2.75
Guggenheim-Broughton 3 (2) L	2	4.00	2	3.00	2	1.00	2	4.00	2	4.00	2	3.50	2	1.00	2	4.00
Guggenheim-Redling 1 (11) L	10	3.78	10	2.20	10	1.10	10	3.20	10	3.40	10	2.80	10	2.00	10	3.60
Guggenheim-Redling 2 (8) L	8	3.88	8	2.00	8	1.63	8	3.25	8	3.63	8	2.75	8	2.00	8	3.63
Guggenheim-Redling 3 (8)	7	3.57	7	2.57	7	1.57	7	3.29	7	3.14	7	2.71	7	2.14	7	3.14
Guggenheim-Redling 4 (6)	5	4.00	5	1.60	5	1.00	5	4.00	5	4.00	5	3.80	5	1.40	5	4.00
Guggenheim-Redling 5 (4) L	4	4.00	4	2.25	4	1.00	4	3.50	4	4.00	4	2.50	4	1.75	4	3.75
Weir-Flader 1 (9)	9	3.67	9	2.78	9	1.22	9	3.33	9	3.67	9	3.11	9	1.11	9	3.56
Weir-Flader 2 (10)	6	4.00	6	2.67	6	1.17	6	3.50	6	3.83	6	3.67	6	2.17	6	3.50
–Conventional–																
Von Steuben-Friedman 1 (13)	11	3.55	11	2.40	11	1.00	11	3.36	11	4.00	11	3.45	11	1.64	11	3.64
Von Steuben-Friedman 2 (13)	5	3.80	5	3.00	5	1.60	5	3.00	5	4.00	5	2.20	5	2.20	5	3.40

* L = Longitudinal students, whole class not in study.

Table D13

Student Preference Ranking of Classes in District 2, Grade 7

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—						
Guggenheim-Broughton 1 (9)	9	11	0	22	22	11	11	0	11	0	11
Guggenheim-Broughton 2 (5) L[2]	5	20	0	0	0	0	0	20	0	0	60
Guggenheim-Broughton 3 (2) L[3]	0	--	--	--	--	--	--	--	--	--	--
Guggenheim-Redling 1 (11) L	5	0	0	0	0	0	20	0	0	0	80
Guggenheim-Redling 2 (8) L	6	17	17	17	0	0	0	0	33	0	17
Guggenheim-Redling 3 (8)	7	0	0	0	0	14	0	0	14	0	71
Guggenheim-Redling 4 (6)	6	0	17	0	0	0	17	17	17	0	33
Guggenheim-Redling 5 (4) L	3	0	0	0	0	0	33	0	0	0	67
Weir-Flader 1 (9)	9	11	33	22	0	0	22	11	0	0	0
Weir-Flader 2 (10)	9	11	11	33	22	0	0	11	0	0	11
					—Conventional—						
Von Steuben-Friedman 1 (13)[3]	13	--	--	--	--	--	--	--	--	--	--
Von Steuben-Friedman 2 (13)[3]	13	--	--	--	--	--	--	--	--	--	--

[1] Other includes mutiple preferences.

[2] L = Longitudinal students, whole class not in study.

[3] Preference data were unavailable.

Note: Response rates designate class mean percents.

Table D14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 2

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— *MiC* —															
Guggenheim-Broughton 1 (9)	9	22	33	33	11	9	0	11	33	45	9	22	33	22	22
Guggenheim-Broughton 2 (5) L*	5	40	20	20	20	5	20	20	40	20	5	40	0	40	20
Guggenheim-Broughton 3 (2) L	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Guggenheim-Redling 1 (11) L	5	20	80	0	0	5	20	60	20	0	5	60	40	0	0
Guggenheim-Redling 2 (8) L	6	0	83	17	0	6	0	33	67	0	6	33	67	0	0
Guggenheim-Redling 3 (8)	7	43	57	0	0	6	33	50	17	0	7	43	57	0	0
Guggenheim-Redling 4 (6)	6	50	50	0	0	6	50	17	33	0	6	33	17	33	17
Guggenheim-Redling 5 (4) L	3	33	67	0	0	3	0	33	67	0	3	33	33	33	0
Weir-Flader 1 (9)	9	22	78	0	0	9	11	33	44	11	9	33	56	11	0
Weir-Flader 2 (10)	9	22	44	22	11	9	33	33	33	0	9	33	11	11	44
—Conventional —															
Von Steuben-Friedman 1 (13)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Von Steuben-Friedman 2 (13)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-

* L = Longitudinal students, whole class not in study.

Note: Response rates designate class mean percents.

APPENDIX D

GRADE 8, DISTRICT 2

Table D1

Fixed Characteristics for Eighth-Grade Classes in District 2

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
—MiC—													
Guggenheim-Carlson 1 (9) L*	1	8	100	0	33	33	22	0	0	11	0	0	0
Guggenheim-Carlson 2 (7) L	3	4	100	0	29	43	14	0	0	14	0	0	0
Guggenheim-Carlson 3 (16)	5	11	94	6	25	38	31	6	0	0	0	0	0
Guggenheim-Carlson 4 (11) L	3	8	82	18	18	36	9	0	0	27	0	0	9
Guggenheim-Carlson 5 (14)	8	6	71	0	43	21	29	0	0	0	0	7	0
Guggenheim-Dillard 1 (7)	2	5	100	0	0	0	0	14	14	57	14	0	0
Guggenheim-Dillard 2 (13)	8	5	100	0	0	38	38	0	0	15	0	8	0
Weir-Gallardo 1 (10)	5	5	30	60	50	40	0	0	0	10	0	0	0
Weir-Gallardo 2 (13)	8	5	85	0	62	23	0	0	0	15	0	0	0
Weir-Shepard 1 (9)	5	4	100	0	78	11	0	0	0	11	0	0	0
Weir-Shepard 2 (10)	5	5	60	20	50	10	0	0	0	30	10	0	0
—Conventional—													
(none)													

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** L = Longitudinal student, whole class not in study.

Table D2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 2

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preferenc	Non-Response	African America	Hispanic	White	Native America	Asian	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
—MiC—													
Guggenheim-Carlson 1 (4)	1	3	100	0	50	25	25	0	0	0	0	0	0
Guggenheim-Carlson 2 (3)	0	3	100	0	0	33	33	0	0	33	0	0	0
Guggenheim-Carlson 3 (3)	1	2	100	0	0	67	33	0	0	0	0	0	0
Guggenheim-Carlson 4 (1)	0	1	100	0	0	0	0	0	0	100	0	0	0
Guggenheim-Carlson 5 (8)	5	3	86	0	38	0	50	0	0	0	0	13	0
Guggenheim-Dillard 1 (2)	1	1	100	0	0	0	0	50	0	50	0	0	0
Guggenheim-Dillard 2 (5)	4	1	100	0	0	40	60	0	0	0	0	0	0
—Conventional—													
(none)													
Longitudinal Years 2 & 3													
—MiC—													
Guggenheim-Carlson 1 (5)	0	5	100	0	20	40	20	0	0	20	0	0	0
Guggenheim-Carlson 2 (4)	3	1	100	0	50	50	0	0	0	0	0	0	0
Guggenheim-Carlson 3 (13)	4	9	77	23	23	23	31	8	0	0	0	0	15
Guggenheim-Carlson 4 (10)	3	7	80	20	20	40	10	0	0	0	0	0	10
Guggenheim-Carlson 5 (6)	3	3	50	0	50	50	0	0	0	0	0	0	0
Guggenheim-Dillard 1 (5)	1	4	100	0	0	0	0	0	20	60	20	0	0
Guggenheim-Dillard 2 (8)	4	4	100	0	0	38	25	0	0	25	0	13	0
Weir-Gallardo 1 (10)	5	5	30	60	50	40	0	0	0	10	0	0	0
Weir-Gallardo 2 (13)	8	5	85	0	62	23	0	0	0	15	0	0	0
Weir-Shepard 1 (9)	5	4	100	0	78	11	0	0	0	11	0	0	0
Weir-Shepard 2 (10)	5	5	60	20	50	10	0	0	0	30	10	0	0
—Conventional—													
(none)													

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table D3

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 2

School-Class *(N)*	SAT National Percentile					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
			—MiC—			
Guggenheim-Carlson 1 (9) L*	8	42.88	25.97	8	40.5	85
Guggenheim-Carlson 2 (7) L	6	47.67	22.88	20	49.5	78
Guggenheim-Carlson 3 (16)	15	40.20	21.12	14	39.0	78
Guggenheim-Carlson 4 (11) L	9	19.89	23.23	4	12.0	78
Guggenheim-Carlson 5 (14)	12	23.17	18.10	1	22.0	53
Guggenheim-Dillard 1 (7)	7	41.86	37.49	3	32.0	94
Guggenheim-Dillard 2 (13)	11	51.18	20.04	12	56.0	74
Weir-Gallardo 1 (10)	10	57.70	30.22	10	69.0	91
Weir-Gallardo 2 (13)	12	42.50	28.26	3	40.5	85
Weir-Shepard 1 (9)	9	36.22	20.72	8	35.0	69
Weir-Shepard 2 (10)	9	18.78	16.38	3	12.0	49
			—Conventional—			
(none)						

* L = Longitudinal student, whole class not in study.

Table D4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 2

School-Class *(N)*	SAT National Percentile					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
Longitudinal Years 1, 2, & 3						
—MiC—						
Guggenheim-Carlson 1 (4)	3	19.00	9.64	8	23.0	26
Guggenheim-Carlson 2 (3)	2	61.50	2.12	60	61.5	63
Guggenheim-Carlson 3 (3)	3	41.00	24.02	14	49.0	60
Guggenheim-Carlson 4 (1)	0	-	-	-	-	-
Guggenheim-Carlson 5 (8)	8	22.75	20.42	1	17.5	53
Guggenheim-Dillard 1 (2)	2	78.50	21.92	63	78.5	94
Guggenheim-Dillard 2 (5)	5	49.60	24.40	12	53.0	74
—Conventional—						
(none)						
Longitudinal Years 2 & 3						
—MiC—						
Guggenheim-Carlson 1 (5)	5	57.20	21.22	39	45.0	85
Guggenheim-Carlson 2 (4)	4	40.75	26.07	20	32.5	78
Guggenheim-Carlson 3 (13)	12	40.00	21.51	14	39.0	78
Guggenheim-Carlson 4 (10)	9	19.89	23.23	4	12.0	78
Guggenheim-Carlson 5 (6)	4	24.00	15.08	4	26.0	40
Guggenheim-Dillard 1 (5)	5	27.20	32.38	3	17.0	81
Guggenheim-Dillard 2 (8)	6	52.50	17.95	20	56.0	74
Weir-Gallardo 1 (10)	10	57.70	30.22	10	69.0	91
Weir-Gallardo 2 (13)	12	42.50	28.26	3	40.5	85
Weir-Shepard 1 (9)	9	36.22	20.72	8	35.0	69
Weir-Shepard 2 (10)	9	18.78	16.38	3	12.0	49
—Conventional—						
(none)						

Table D5

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 2

School-Class *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
—MiC—					
Guggenheim-Carlson 1 (9)L*	8	2.50	0.75	0.00	0.00
Guggenheim-Carlson 2 (7) L	7	3.00	1.71	0.57	0.00
Guggenheim-Carlson 3 (16)	13	2.85	1.00	0.23	0.00
Guggenheim-Carlson 4 (11) L	6	3.33	1.00	0.17	0.00
Guggenheim-Carlson 5 (14)	12	1.83	0.42	0.17	0.00
Guggenheim-Dillard 1 (7)	6	2.67	1.83	0.67	0.00
Guggenheim-Dillard 2 (13)	10	3.40	1.30	0.10	0.00
Weir-Gallardo 1 (10)	5	2.60	1.20	0.40	0.00
Weir-Gallardo 2 (13)	5	2.20	0.80	0.20	0.00
Weir-Shepard 1 (9)	2	2.50	1.00	0.00	0.00
Weir-Shepard 2 (10)	3	1.33	0.00	0.00	0.00
—Conventional—					
(none)					

* L = Longitudinal student, whole class not in study.

Table D6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 2

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
—MiC—											
Guggenheim-Carlson 1 (9) L*	8			2.50		0.75		0.00		0.00	
Number		12.50%	87.50%		0.00%		0.00%		0.00%		0.00%
Algebra		50.00%	25.00%		0.00%		0.00%		0.00%		25.00%
Space		25.00%	25.00%		25.00%		0.00%		0.00%		25.00%
Measurement		25.00%	12.50%		50.00%		0.00%		0.00%		12.50%
Chance&Data		50.00%	25.00%		0.00%		0.00%		0.00%		25.00%
Guggenheim-Carlson 2 (7) L	7			3.00		1.71		0.57		0.00	
Number		14.29%	57.14%		0.00%		28.57%		0.00%		0.00%
Algebra		71.43%	28.57%		0.00%		0.00%		0.00%		0.00%
Space		14.29%	14.29%		42.86%		28.57%		0.00%		0.00%
Measurement		14.29%	14.29%		71.43%		0.00%		0.00%		0.00%
Chance&Data		71.43%	14.29%		0.00%		0.00%		0.00%		14.29%
Guggenheim-Carlson 3 (16)	13			2.85		1.00		0.23		0.00	
Number		7.69%	76.92%		7.69%		7.69%		0.00%		0.00%
Algebra		61.54%	38.46%		0.00%		0.00%		0.00%		0.00%
Space		38.46%	15.38%		38.46%		7.69%		0.00%		0.00%
Measurement		15.38%	46.15%		30.77%		7.69%		0.00%		0.00%
Chance&Data		92.31%	7.69%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 4 (11) L	6			3.33		1.00		0.17		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		16.67%	16.67%		50.00%		16.67%		0.00%		0.00%
Measurement		50.00%	16.67%		33.33%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 5 (14)	12			1.83		0.42		0.17		0.00	
Number		8.33%	58.33%		0.00%		8.33%		0.00%		25.00%
Algebra		25.00%	50.00%		0.00%		0.00%		0.00%		25.00%
Space		25.00%	16.67%		25.00%		8.33%		0.00%		25.00%
Measurement		66.67%	8.33%		0.00%		0.00%		0.00%		25.00%
Chance&Data		66.67%	8.33%		0.00%		0.00%		0.00%		25.00%
Guggenheim-Dillard 1 (7)	6			2.67		1.83		0.67		0.00	
Number		0.00%	33.33%		0.00%		33.33%		0.00%		33.33%
Algebra		16.67%	50.00%		0.00%		0.00%		0.00%		33.33%
Space		0.00%	0.00%		50.00%		16.67%		0.00%		33.33%
Measurement		0.00%	0.00%		66.67%		0.00%		0.00%		33.33%
Chance&Data		50.00%	0.00%		0.00%		16.67%		0.00%		33.33%

* L = Longitudinal student, whole class not in study.

Table D6 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Guggenheim-Dillard 2 (13)	10			3.40		1.30		0.10		0.00	
Number		0.00%	80.00%		10.00%		10.00%		0.00%		0.00%
Algebra		30.00%	60.00%		0.00%		0.00%		0.00%		10.00%
Space		10.00%	20.00%		60.00%		0.00%		0.00%		10.00%
Measurement		20.00%	10.00%		50.00%		0.00%		0.00%		20.00%
Chance&Data		40.00%	40.00%		0.00%		0.00%		0.00%		20.00%
Weir-Gallardo 1 (10)	5			2.60		1.20		0.40		0.00	
Number		20.00%	20.00%		20.00%		40.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	40.00%		20.00%		0.00%		0.00%		0.00%
Measurement		60.00%	0.00%		40.00%		0.00%		0.00%		0.00%
Chance&Data		80.00%	20.00%		0.00%		0.00%		0.00%		0.00%
Weir-Gallardo 2 (13)	5			2.20		0.80		0.20		0.00	
Number		60.00%	40.00%		0.00%		0.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	0.00%		40.00%		20.00%		0.00%		0.00%
Measurement		60.00%	20.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		80.00%	20.00%		0.00%		0.00%		0.00%		0.00%
Weir-Shepard 1 (9)	2			2.50		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Weir-Shepard 2 (10)	3			1.33		0.00		0.00		0.00	
Number		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Algebra		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Space		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
—Conventional—											
(none)											

Table D7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Eighth-Grade Classes in District 2

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
LONGITUDINAL IN YEARS 1, 2, & 3											
				—MiC—							
Guggenheim-Carlson 1 (4)	4			2.25		0.50		0.00		0.00	
Number		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Algebra		25.00%	25.00%		0.00%		0.00%		0.00%		50.00%
Space		0.00%	25.00%		25.00%		0.00%		0.00%		50.00%
Measurement		25.00%	25.00%		25.00%		0.00%		0.00%		25.00%
Chance&Data		25.00%	25.00%		0.00%		0.00%		0.00%		50.00%
Guggenheim-Carlson 2 (3)	3			2.67		1.33		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	33.33%		33.33%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		66.67%	0.00%		0.00%		0.00%		0.00%		33.33%
Guggenheim-Carlson 3 (3)	3			3.67		0.33		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	33.33%		33.33%		0.00%		0.00%		0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 4 (1)	1			3.00		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 5 (8)	8			1.75		0.50		0.13		0.00	
Number		0.00%	50.00%		0.00%		12.50%		0.00%		37.50%
Algebra		25.00%	37.50%		0.00%		0.00%		0.00%		37.50%
Space		12.50%	12.50%		37.50%		0.00%		0.00%		37.50%
Measurement		50.00%	12.50%		0.00%		0.00%		0.00%		37.50%
Chance&Data		50.00%	12.50%		0.00%		0.00%		0.00%		37.50%

Table D7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance: Prestructural *(%)*	Unistructural *(%)*	Unistructural Ave.	Multistructural *(%)*	Multistructural Ave.	Relational *(%)*	Relational Ave.	Extended Abstract *(%)*	Extended Abstract Ave.	No Response *(%)*
Guggenheim-Dillard 1 (2)	2			0.00		0.00		0.00		0.00	
Number		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Algebra		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Space		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Measurement		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Chance&Data		0.00%	0.00%		0.00%		0.00%		0.00%		100.00%
Guggenheim-Dillard 2 (5)	5			2.80		0.80		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		40.00%	40.00%		0.00%		0.00%		0.00%		20.00%
Space		0.00%	20.00%		60.00%		0.00%		0.00%		20.00%
Measurement		20.00%	20.00%		20.00%		0.00%		0.00%		40.00%
Chance&Data		40.00%	20.00%		0.00%		0.00%		0.00%		40.00%
—Conventional—											
(none)											
LONGITUDINAL IN YEARS 2 & 3											
—MiC—											
Guggenheim-Carlson 1 (5)	4			2.75		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	25.00%		25.00%		0.00%		0.00%		0.00%
Measurement		25.00%	0.00%		75.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 2 (4)	4			3.25		2.00		1.00		0.00	
Number		25.00%	25.00%		0.00%		50.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		50.00%		50.00%		0.00%		0.00%
Measurement		25.00%	25.00%		50.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 3 (13)	10			2.60		1.20		0.30		0.00	
Number		10.00%	70.00%		10.00%		10.00%		0.00%		0.00%
Algebra		70.00%	30.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	10.00%		40.00%		10.00%		0.00%		0.00%
Measurement		20.00%	30.00%		40.00%		10.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%

Table D7 *(continued)*

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
Guggenheim-Carlson 4 (10)	5			3.40		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	20.00%		60.00%		20.00%		0.00%		0.00%
Measurement		60.00%	20.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Carlson 5 (6)	5			2.00		0.25		0.25		0.00	
Number		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	25.00%		0.00%		25.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Guggenheim-Dillard 1 (5)	5			4.00		2.75		1.00		0.00	
Number		0.00%	50.00%		0.00%		50.00%		0.00%		0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		75.00%		25.00%		0.00%		0.00%
Measurement		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	0.00%		0.00%		25.00%		0.00%		0.00%
Guggenheim-Dillard 2 (8)	5			4.00		1.80		0.20		0.00	
Number		0.00%	60.00%		20.00%		20.00%		0.00%		0.00%
Algebra		20.00%	80.00%		0.00%		0.00%		0.00%		0.00%
Space		20.00%	20.00%		60.00%		0.00%		0.00%		0.00%
Measurement		20.00%	0.00%		80.00%		0.00%		0.00%		0.00%
Chance&Data		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Weir-Gallardo 1 (10)	5			2.60		1.20		0.40		0.00	
Number		20.00%	20.00%		20.00%		40.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	40.00%		20.00%		0.00%		0.00%		0.00%
Measurement		60.00%	0.00%		40.00%		0.00%		0.00%		0.00%
Chance&Data		80.00%	20.00%		0.00%		0.00%		0.00%		0.00%

Table D7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance: Prestructural *(%)*	Unistructural *(%)*	Unistructural Ave.	Multistructural *(%)*	Multistructural Ave.	Relational *(%)*	Relational Ave.	Extended Abstract *(%)*	Extended Abstract Ave.	No Response *(%)*
Weir-Gallardo 2 (13)	5			2.20		0.80		0.20		0.00	
Number		60.00%	40.00%		0.00%		0.00%		0.00%		0.00%
Algebra		40.00%	60.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	0.00%		40.00%		20.00%		0.00%		0.00%
Measurement		60.00%	20.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		80.00%	20.00%		0.00%		0.00%		0.00%		0.00%
Weir-Shepard 1 (9)	2			2.50		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Weir-Shepard 2 (10)	3			1.33		0.00		0.00		0.00	
Number		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Algebra		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Space		66.67%	33.33%		0.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
—Conventional—											
(none)											

Table D8

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 2

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
					–MiC–					
Guggenheim-Carlson 1 (9) L*	9	2.19	9	2.09	9	2.35	9	1.86	9	2.20
Guggenheim-Carlson 2 (7) L	7	2.17	7	2.04	7	2.23	7	1.93	7	2.10
Guggenheim-Carlson 3 (16)	14	2.00	14	2.29	14	2.26	14	1.74	14	1.87
Guggenheim-Carlson 4 (11) L	10	2.42	10	2.22	10	2.40	10	1.75	10	1.94
Guggenheim-Carlson 5 (14)	12	2.07	12	2.25	12	2.09	12	1.89	12	2.17
Guggenheim-Dillard 1 (7)	7	2.14	7	2.11	7	2.30	7	1.70	7	2.04
Guggenheim-Dillard 2 (13)	9	1.85	9	2.00	9	1.90	9	1.54	9	1.81
Weir-Gallardo 1 (10)	9	1.80	9	1.88	9	2.22	9	1.78	9	1.94
Weir-Gallardo 2 (13)	12	2.08	12	2.08	12	2.27	12	1.98	12	2.10
Weir-Shepard 1 (9)	8	1.90	8	1.93	8	2.09	8	1.56	8	2.01
Weir-Shepard 2 (10)	7	1.63	7	1.95	7	2.11	7	1.80	7	1.96
					–Conventional–					
(none)										

* L = Longitudinal student, whole class not in study.

Table D9

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory in Distric

School-Class *(N)*	**Subscale *(1 = very true; 4 = not true at all)***				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
		–MiC–			
Guggenheim-Carlson 1 (9) L*					
Count	9	9	9	9	9
Mean	2.19	2.09	2.35	1.86	2.20
Median	2.17	2.00	2.25	1.75	2.14
Minimum	1.83	1.40	1.75	1.38	1.50
Maximum	2.50	3.00	2.88	2.57	3.57
Std. Deviation	0.26	0.49	0.33	0.40	0.62
Guggenheim-Carlson 2 (7) L					
Count	7	7	7	7	7
Mean	2.17	2.04	2.23	1.93	2.10
Median	2.17	2.00	2.38	1.88	2.00
Minimum	1.83	1.60	1.38	1.50	1.71
Maximum	2.50	2.40	2.63	2.38	2.71
Std. Deviation	0.24	0.27	0.45	0.31	0.33
Guggenheim-Carlson 3 (16)					
Count	14	14	14	14	14
Mean	2.00	2.29	2.26	1.74	1.87
Median	1.83	2.20	2.13	1.63	1.86
Minimum	1.50	1.60	1.38	1.13	1.14
Maximum	2.67	3.20	3.50	2.57	2.57
Std. Deviation	0.40	0.43	0.65	0.52	0.45
Guggenheim-Carlson 4 (11) L					
Count	10.00	10.00	10.00	10.00	10.00
Mean	2.42	2.22	2.40	1.75	1.94
Median	2.58	2.30	2.50	1.69	1.93
Minimum	1.00	1.20	1.50	1.00	1.43
Maximum	3.00	3.00	3.13	2.50	2.57
Std. Deviation	0.62	0.60	0.51	0.44	0.38

* L = Longitudinal student, whole class not in study.

Table D9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Guggenheim-Carlson 5 (14)					
Count	12	12	12	12	12
Mean	2.07	2.25	2.09	1.89	2.17
Median	2.00	2.30	2.00	1.88	2.14
Minimum	1.33	1.40	1.13	1.25	1.57
Maximum	2.67	3.20	3.25	2.88	2.86
Std. Deviation	0.43	0.50	0.67	0.48	0.40
Guggenheim-Dillard 1 (7)					
Count	7	7	7	7	7
Mean	2.14	2.11	2.30	1.70	2.04
Median	2.17	2.00	2.13	1.63	2.00
Minimum	1.17	1.60	1.63	1.38	1.57
Maximum	3.00	2.60	3.38	2.00	2.57
Std. Deviation	0.55	0.38	0.62	0.24	0.37
Guggenheim-Dillard 2 (13)					
Count	9	9	9	9	9
Mean	1.85	2.00	1.90	1.54	1.81
Median	1.83	2.00	1.88	1.38	1.86
Minimum	1.50	1.40	1.13	1.25	1.14
Maximum	2.33	2.60	2.63	2.00	2.29
Std. Deviation	0.28	0.33	0.48	0.28	0.36
Weir-Gallardo 1 (10)					
Count	9	9	9	9	9
Mean	1.80	1.88	2.22	1.78	1.94
Median	1.67	1.80	2.38	1.50	1.71
Minimum	1.00	1.00	1.00	1.25	1.00
Maximum	2.67	3.50	3.50	3.50	3.00
Std. Deviation	0.60	0.88	0.98	0.69	0.69

Table D9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Weir-Gallardo 2 (13)					
Count	12	12	12	12	12
Mean	2.08	2.08	2.27	1.98	2.10
Median	2.00	1.90	2.23	1.78	2.07
Minimum	1.67	1.60	1.25	1.25	1.50
Maximum	2.67	3.20	3.88	3.00	2.71
Std. Deviation	0.33	0.47	0.63	0.57	0.37
Weir-Shepard 1(9)					
Count	8	8	8	8	8
Mean	1.90	1.93	2.09	1.56	2.01
Median	1.83	2.00	2.25	1.63	2.07
Minimum	1.00	1.00	1.25	1.00	1.29
Maximum	2.67	2.60	2.75	2.00	2.57
Std. Deviation	0.57	0.52	0.58	0.35	0.45
Weir-Shepard 2 (10)					
Count	7	7	7	7	7
Mean	1.63	1.95	2.11	1.80	1.96
Median	1.50	2.00	2.25	1.63	2.00
Minimum	1.00	1.00	1.13	1.40	1.43
Maximum	2.50	2.67	3.20	3.00	2.57
Std. Deviation	0.55	0.55	0.85	0.54	0.36

Table D10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 2, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Guggenheim-Carlson (57)	52	1.62	52	1.63	52	2.31	52	1.38	52	1.38	50	1.90	51	2.49	52	2.54
Guggenheim-Dillard (20)	16	1.63	16	2.13	16	2.56	16	1.25	16	1.31	16	1.50	16	2.00	16	2.50
Weir-Gallardo (23)	21	1.43	21	1.43	21	2.29	21	1.19	21	1.57	20	1.55	19	2.37	20	2.30
Weir-Shepard (19)	14	1.29	14	1.21	14	2.64	14	1.21	15	1.13	14	2.00	15	2.20	15	2.73
—Conventional—																
(none)																

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Guggenheim-Carlson (57)	52	2.79	52	1.81	52	2.42	52	3.13	51	2.86	52	1.87	52	1.50	50	2.92
Guggenheim-Dillard (20)	16	3.19	16	1.69	16	1.75	16	3.13	16	2.31	16	2.00	16	1.75	19	2.95
Weir-Gallardo (23)	20	2.55	20	1.85	20	2.60	19	3.21	19	2.53	19	2.16	19	1.42	16	3.25
Weir-Shepard (19)	14	2.71	14	1.86	14	2.43	14	3.50	14	2.50	14	1.50	14	1.36	12	2.90
—Conventional—																
(none)																

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table D11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 2

School-Class *(N)*	Item Number *(see Key)*																							
	3			4			6			11			16			20			27			28		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
—MiC—																								
Guggenheim-Carlson 1 (9) L*	9	1.44	0.53	9	1.89	0.78	9	2.33	1.00	9	1.22	0.44	9	1.67	1.00	9	2.33	0.87	9	2.33	0.87	9	2.56	1.01
Guggenheim-Carlson 2 (7) L	7	1.29	0.49	7	1.57	0.53	7	2.57	0.79	7	1.29	0.49	7	1.29	0.49	7	1.57	0.53	7	3.00	0.82	7	2.00	0.82
Guggenheim-Carlson 3 (16)	14	2.07	1.07	14	1.50	0.65	14	2.29	0.99	14	1.43	0.65	14	1.50	0.85	13	1.69	0.63	14	2.43	1.22	14	2.64	0.74
Guggenheim-Carlson 4 (11) L	10	1.40	0.70	10	1.70	0.82	10	2.10	0.88	10	1.40	0.97	10	1.10	0.32	10	1.90	0.88	9	2.67	1.00	10	2.60	1.17
Guggenheim-Carlson 5 (14)	12	1.58	0.90	12	1.58	0.90	12	2.33	1.07	12	1.50	0.67	12	1.33	0.49	11	2.00	1.00	12	2.25	0.97	12	2.67	0.98
Guggenheim-Dillard 1 (7)	7	1.86	0.38	7	2.29	1.11	7	3.14	0.90	7	1.29	0.49	7	1.29	0.49	7	1.86	1.46	7	2.14	1.07	7	2.86	1.21
Guggenheim-Dillard 2 (13)	9	1.44	0.53	9	2.00	0.71	9	2.11	0.78	9	1.22	0.44	9	1.33	0.71	9	1.22	0.67	9	1.89	1.05	9	2.22	0.67
Weir-Gallardo 1 (10)	9	1.56	0.73	9	1.78	0.97	9	1.78	1.09	9	1.22	0.44	9	1.56	0.88	8	1.00	0.00	8	1.88	1.25	8	2.75	1.28
Weir-Gallardo 2 (13)	12	1.33	0.49	12	1.17	0.39	12	2.67	1.15	12	1.17	0.39	12	1.58	0.90	12	1.92	1.08	11	2.73	1.27	12	2.00	0.74
Weir-Shepard 1 (9)	8	1.13	0.35	8	1.00	0.00	8	2.63	0.92	8	1.13	0.35	8	1.13	0.35	7	1.86	1.21	8	1.88	1.36	8	2.88	1.13
Weir-Shepard 2 (10)	6	1.50	0.84	6	1.50	0.55	6	2.67	0.82	6	1.33	0.52	7	1.14	0.38	7	2.14	1.21	7	2.57	1.13	7	2.57	0.98
—Conventional—																								
(none)																								

School-Class *(N)*	37			38			39			44			45			49			53			55		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
—MiC—																								
Guggenheim-Carlson 1 (9) L	9	2.67	0.50	9	2.11	1.05	9	2.33	1.12	9	3.00	0.50	9	2.67	1.12	9	1.67	0.71	9	1.67	1.00	7	2.86	0.69
Guggenheim-Carlson 2 (7) L	7	2.14	0.69	7	1.57	0.79	7	2.00	0.58	7	2.71	0.95	7	2.86	1.07	7	1.43	0.53	7	1.43	0.79	14	3.07	0.83
Guggenheim-Carlson 3 (16)	14	2.86	1.10	14	1.86	0.95	14	2.36	0.93	14	3.29	0.73	14	3.07	0.83	14	2.07	0.73	14	1.36	0.50	10	3.10	0.99
Guggenheim-Carlson 4 (11) L	10	3.40	1.07	10	1.90	0.74	10	2.70	1.06	10	3.60	0.52	10	2.60	1.07	10	2.00	1.05	10	1.40	0.52	12	2.75	0.87
Guggenheim-Carlson 5 (14)	12	2.67	0.98	12	1.58	0.67	12	2.58	0.90	12	2.92	0.67	11	3.00	1.10	12	1.92	0.51	12	1.67	0.78	7	2.71	0.95
Guggenheim-Dillard 1 (7)	7	3.14	0.90	7	1.71	0.76	7	2.00	0.58	7	3.14	0.69	7	2.29	1.11	7	2.14	1.21	7	1.86	1.21	9	3.00	1.00
Guggenheim-Dillard 2 (13)	9	3.22	1.09	9	1.67	0.71	9	1.56	0.73	9	3.11	1.05	9	2.33	1.00	9	1.89	1.27	9	1.67	1.00	10	2.90	1.10
Weir-Gallardo 1 (10)	8	2.38	1.30	8	1.50	0.93	8	2.25	1.28	8	3.50	0.76	8	2.38	1.41	8	1.88	0.99	8	1.25	0.46	8	3.50	0.76
Weir-Gallardo 2 (13)	12	2.67	0.98	12	2.08	1.08	12	2.83	0.94	11	3.00	0.77	11	2.64	1.12	11	2.36	1.43	11	1.55	0.69	8	3.00	1.31
Weir-Shepard 1 (9)	8	2.75	1.28	8	1.63	0.92	8	2.25	1.28	8	3.38	1.06	8	2.88	1.13	8	1.50	0.53	8	1.50	0.76	6	3.00	0.63
Weir-Shepard 2 (10)	6	2.67	0.52	6	2.17	0.75	6	2.67	0.82	6	3.67	0.52	6	2.00	1.10	6	1.50	0.55	6	1.17	0.41	6	2.80	0.95
—Conventional—																								
(none)																								

* L = Longitudinal student, whole class not in study.

Table D11 *(continued)*

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table D12

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 2

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Guggenheim-Carlson 1 (9) L*	9	3.13	9	2.33	9	1.67	9	3.56	9	3.44	9	2.56	9	1.75	9	3.00
Guggenheim-Carlson 2 (7) L	7	3.71	7	2.29	7	1.43	7	3.43	7	3.86	7	3.14	7	2.29	7	3.57
Guggenheim-Carlson 3 (16)	14	3.29	14	2.36	14	1.50	14	2.93	14	3.36	14	2.86	14	1.64	14	3.21
Guggenheim-Carlson 4 (11) L	10	3.50	10	2.10	10	1.60	10	2.60	10	3.50	10	2.40	10	1.40	10	3.00
Guggenheim-Carlson 5 (14)	12	3.17	12	2.58	12	1.50	12	3.42	12	3.42	12	2.83	12	1.92	12	3.50
Guggenheim-Dillard 1 (7)	7	3.86	7	2.14	7	1.71	7	3.43	7	2.86	7	2.71	7	2.57	7	3.29
Guggenheim-Dillard 2 (13)	9	4.00	9	2.56	9	1.44	9	3.44	9	3.78	9	2.56	9	1.89	9	3.89
Weir-Gallardo 1 (10)	9	3.89	9	2.33	9	1.38	9	3.38	9	3.75	9	3.50	9	2.00	9	3.50
Weir-Gallardo 2 (13)	12	3.58	12	2.33	12	1.92	12	3.25	12	3.58	12	3.08	12	1.91	12	3.73
Weir-Shepard 1 (9)	8	3.75	8	3.00	8	1.13	8	3.63	8	3.38	8	2.75	8	2.00	8	3.50
Weir-Shepard 2 (10)	7	3.57	7	2.17	7	1.17	7	4.00	7	3.67	7	3.00	7	1.17	7	3.67

* L = Longitudinal student, whole class not in study.

Table D13

Student Preference Ranking of Classes in District 2, Grade 8

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—						
Guggenheim-Carlson 1 (9) L[2]	7	14	29	14	0	0	0	0	29	0	14
Guggenheim-Carlson 2 (7) L	4	75	0	0	0	0	0	0	0	0	25
Guggenheim-Carlson 3 (16)	15	7	0	13	0	0	7	0	20	13	33
Guggenheim-Carlson 4 (11) L	8	13	38	13	0	0	13	0	0	13	13
Guggenheim-Carlson 5 (14)	12	0	25	25	17	0	0	0	8	0	25
Guggenheim-Dillard 1 (7)	6	0	17	0	33	0	17	0	17	0	17
Guggenheim-Dillard 2 (13)	13	15	15	15	0	15	8	8	0	8	15
Weir-Gallardo 1 (10)	10	--	--	--	--	--	--	--	--	--	--
Weir-Gallardo 2 (13)[3]	13	15	15	15	0	8	8	0	8	8	23
Weir-Shepard 1 (9)	9	0	11	11	0	11	33	0	11	0	22
Weir-Shepard 2 (10)	6	17	50	0	0	17	0	0	0	17	0

[1] Other includes mutiple preferences.

[2] Preference data were unavailable.

[3] L = Longitudinal students, whole class not in study.

Note: Response rates designate class mean percents.

Table D14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 2

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
— MiC —															
Guggenheim-Carlson 1 (9) L*	7	0	86	14	0	6	0	33	50	17	7	43	14	43	0
Guggenheim-Carlson 2 (7) L	4	0	75	25	0	4	0	25	50	25	4	50	50	0	0
Guggenheim-Carlson 3 (16)	15	7	47	13	33	15	0	53	47	0	15	27	27	20	27
Guggenheim-Carlson 4 (11) L	7	0	43	43	14	7	14	43	43	0	7	14	29	14	43
Guggenheim-Carlson 5 (14)	12	8	42	50	0	12	17	33	33	17	10	10	30	50	10
Guggenheim-Dillard 1 (7)	6	33	50	17	0	6	0	50	50	0	6	25	50	0	17
Guggenheim-Dillard 2 (13)	13	13	31	46	8	12	8	42	25	25	13	23	31	38	8
Weir-Gallardo 1 (10)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Weir-Gallardo 2 (13)	13	15	54	15	15	13	0	31	38	31	13	46	31	15	8
Weir-Shepard 1 (9)	9	11	67	0	22	9	33	11	11	44	9	56	11	11	22
Weir-Shepard 2 (10)	6	17	83	0	0	6	0	67	33	0	6	50	17	17	17
—Conventional —															
(none)															

* L = Longitudinal student, whole class not in study.

Note: Response rates designate class mean percents.

APPENDIX E

GRADE 7, DISTRICT 3

Table E1

Fixed Characteristics for Seventh-Grade Classes in District 3

School-Class ***(N)***	**Sex** ***(N)***		**Language Preference** ***(%)*** ***** *(self-identified)*		**Ethnicity** ***(%)*** ****** *(self-identified)*								
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Native American**	**Asian**	**Multi-racial**	**Haitian**	**Other**	**Non-Response**
					—MiC—								
Calhoun North-Perry 1 (17)	10	7	100	0	0	0	94	0	0	6	0	0	0
Calhoun North-Perry 2 (19)	10	9	95	0	0	11	74	0	0	16	0	0	0
Calhoun North-Perry 3 (21)	12	9	100	0	0	5	95	0	0	0	0	0	0
Calhoun North-Perry 4 (19)	11	8	100	0	5	0	79	5	0	11	0	0	0
Calhoun North-Perry 5 (13)	7	6	100	0	0	0	69	0	0	31	0	0	0
Calhoun North-Perry 6 (15)	6	9	100	0	0	0	93	0	0	7	0	0	0
Calhoun North-Schroeder 1 (2)***	1	1	50	0	0	0	50	0	0	50	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** Special education classroom.

(For detailed information, see Tables E1-E3 in Appendix E.)

Table E2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 3

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
					—MiC—								
Calhoun North-Perry 1 (16)	9	7	100	0	0	0	94	0	0	6	0	0	0
Calhoun North-Perry 2 (17)	9	8	94	0	0	12	71	0	0	18	0	0	0
Calhoun North-Perry 3 (14)	8	6	100	0	0	7	93	0	0	0	0	0	0
Calhoun North-Perry 4 (15)	8	7	100	0	0	0	80	7	0	13	0	0	0
Calhoun North-Perry 5 (11)	6	5	100	0	0	0	64	0	0	36	0	0	0
Calhoun North-Perry 6 (12)	4	8	100	0	0	0	92	0	0	8	0	0	0
Calhoun North-Schroeder 1 (1) ***	1	0	100	0	0	0	0	0	0	100	0	0	0
Longitudinal Years 2 & 3													
					—MiC—								
Calhoun North-Perry 1 (1)	1	0	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Perry 2 (2)	1	1	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Perry 3 (7)	4	3	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Perry 4 (4)	3	1	100	0	25	0	50	0	0	25	0	0	0
Calhoun North-Perry 5 (2)	1	1	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Perry 6 (3)	2	1	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Schroeder 1 (1)***	0	1	0	0	0	0	100	0	0	0	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** Special education classroom.

Table E3

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 3

School-Class *(N)*	SAT-9					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
		—MiC—				
Calhoun North-Perry 1 (17)	16	62.19	28.24	20	62.0	98
Calhoun North-Perry 2 (19)	19	60.32	23.39	21	52.0	99
Calhoun North-Perry 3 (21)	21	58.00	25.14	11	64.0	97
Calhoun North-Perry 4 (19)	17	52.41	26.89	16	42.0	99
Calhoun North-Perry 5 (13)	13	58.15	25.75	18	60.0	99
Calhoun North-Perry 6 (15)	15	68.60	18.98	34	70.0	94
Calhoun North-Schroeder 1 (2)*	2	21.00	1.41	20	21.0	22

*Special education class

Table E4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 3

School-Class *(N)*	SAT-9					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
Longitudinal Years 1, 2, & 3						
—MiC—						
Calhoun North-Perry 1 (16)	15	62.67	29.17	20	64.0	98
Calhoun North-Perry 2 (17)	17	62.53	23.79	21	68.0	99
Calhoun North-Perry 3 (14)	14	57.21	24.94	11	63.0	97
Calhoun North-Perry 4 (15)	13	56.00	29.05	16	46.0	99
Calhoun North-Perry 5 (11)	11	64.73	21.98	25	63.0	99
Calhoun North-Perry 6 (12)	12	74.00	16.59	46	81.5	94
Calhoun North-Schroeder 1 (1)*	1	22.00	-	22	22.0	22
Longitudinal Years 2 & 3						
—MiC—						
Calhoun North-Perry 1 (1)	1	55.00	-	55	55.0	55
Calhoun North-Perry 2 (2)	2	41.50	0.71	41	41.5	42
Calhoun North-Perry 3 (7)	7	59.57	27.48	26	70.0	89
Calhoun North-Perry 4 (4)	4	40.75	15.59	29	35.5	63
Calhoun North-Perry 5 (2)	2	22.00	5.66	18	22.0	26
Calhoun North-Perry 6 (3)	3	47.00	11.53	34	51.0	56
Calhoun North-Schroeder 1 (1)*	1	20.00	-	20	20.0	20

*Special education class

Table E5

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 3

School-Class *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
		—MiC—			
Calhoun North-Perry 1 (17)	16	2.94	1.56	0.31	0.00
Calhoun North-Perry 2 (19)	17	2.76	1.59	0.41	0.12
Calhoun North-Perry 3 (21)	14	3.07	1.50	0.36	0.00
Calhoun North-Perry 4 (19)	15	3.00	0.73	0.13	0.00
Calhoun North-Perry 5 (13)	11	2.73	1.36	0.18	0.00
Calhoun North-Perry 6 (15)	12	3.17	1.67	0.25	0.00
Calhoun North-Schroeder 1 (2)*	1	0.00	0.00	0.00	0.00

*Special education class

Table E6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 3

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
—MiC—											
Calhoun North-Perry 1 (17)	16			2.94		1.56		0.31		0.00	
Number		31.25%	37.50%		25.00%		6.25%		0.00%		0.00%
Algebra		12.50%	81.25%		6.25%		0.00%		0.00%		0.00%
Space		6.25%	12.50%		50.00%		12.50%		0.00%		18.75%
Measurement		12.50%	6.25%		37.50%		6.25%		0.00%		37.50%
Chance&Data		37.50%	0.00%		6.25%		6.25%		0.00%		50.00%
Calhoun North-Perry 2 (19)	17			2.76		1.59		0.41		0.12	
Number		17.65%	29.41%		11.76%		23.53%		5.88%		11.76%
Algebra		23.53%	52.94%		0.00%		0.00%		0.00%		23.53%
Space		11.76%	0.00%		64.71%		5.88%		0.00%		17.65%
Measurement		11.76%	23.53%		35.29%		5.88%		0.00%		23.53%
Chance&Data		41.18%	11.76%		5.88%		0.00%		0.00%		41.18%
Calhoun North-Perry 3 (21)	14			3.07		1.50		0.36		0.00	
Number		14.29%	57.14%		14.29%		7.14%		0.00%		7.14%
Algebra		28.57%	64.29%		0.00%		0.00%		0.00%		7.14%
Space		21.43%	7.14%		50.00%		21.43%		0.00%		0.00%
Measurement		21.43%	14.29%		50.00%		7.14%		0.00%		7.14%
Chance&Data		57.14%	14.29%		0.00%		0.00%		0.00%		28.57%
Calhoun North-Perry 4 (19)	15			3.00		0.73		0.13		0.00	
Number		6.67%	86.67%		0.00%		6.67%		0.00%		0.00%
Algebra		20.00%	73.33%		0.00%		0.00%		0.00%		6.67%
Space		20.00%	20.00%		46.67%		0.00%		0.00%		13.33%
Measurement		20.00%	33.33%		20.00%		0.00%		0.00%		26.67%
Chance&Data		40.00%	20.00%		0.00%		0.00%		0.00%		40.00%
Calhoun North-Perry 5 (13)	11			2.73		1.36		0.18		0.00	
Number		27.27%	63.64%		9.09%		0.00%		0.00%		0.00%
Algebra		27.27%	63.64%		0.00%		0.00%		0.00%		9.09%
Space		18.18%	9.09%		54.55%		9.09%		0.00%		9.09%
Measurement		45.45%	0.00%		45.45%		0.00%		0.00%		9.09%
Chance&Data		54.55%	0.00%		9.09%		9.09%		0.00%		27.27%

Table E6 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**istructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Calhoun North-Perry 6 (15)	12			3.17		1.67		0.25		0.00	
Number		25.00%	58.33%		16.67%		0.00%		0.00%		0.00%
Algebra		16.67%	83.33%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	8.33%		50.00%		0.00%		0.00%		8.33%
Measurement		16.67%	8.33%		66.67%		8.33%		0.00%		0.00%
Chance&Data		41.67%	8.33%		0.00%		16.67%		0.00%		33.33%
Calhoun North-Schroeder 1 (2)*	1			0.00		0.00		0.00		0.00	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-

*Special education class

Table E7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Seventh-Grade Classes in District 3

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	Unistructural		Multistructural		Relational		Extended Abstract		No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
LONGITUDINAL IN YEARS 1, 2, & 3											
					—MiC—						
Calhoun North-Perry 1 (16)	16			2.94		1.56		0.31		0.00	
Number		31.25%	37.50%		25.00%		6.25%		0.00%		0.00%
Algebra		12.50%	81.25%		6.25%		0.00%		0.00%		0.00%
Space		6.25%	12.50%		50.00%		12.50%		0.00%		18.75%
Measurement		12.50%	6.25%		37.50%		6.25%		0.00%		37.50%
Chance&Data		37.50%	0.00%		6.25%		6.25%		0.00%		50.00%
Calhoun North-Perry 2 (17)	17			2.76		1.59		0.41		0.12	
Number		17.65%	29.41%		11.76%		23.53%		5.88%		11.76%
Algebra		23.53%	52.94%		0.00%		0.00%		0.00%		23.53%
Space		11.76%	0.00%		64.71%		5.88%		0.00%		17.65%
Measurement		11.76%	23.53%		35.29%		5.88%		0.00%		23.53%
Chance&Data		41.18%	11.76%		5.88%		0.00%		0.00%		41.18%
Calhoun North-Perry 3 (14)	14			3.07		1.50		0.36		0.00	
Number		14.29%	57.14%		14.29%		7.14%		0.00%		7.14%
Algebra		28.57%	64.29%		0.00%		0.00%		0.00%		7.14%
Space		21.43%	7.14%		50.00%		21.43%		0.00%		0.00%
Measurement		21.43%	14.29%		50.00%		7.14%		0.00%		7.14%
Chance&Data		57.14%	14.29%		0.00%		0.00%		0.00%		28.57%
Calhoun North-Perry 4 (15)	15			3.00		0.73		0.13		0.00	
Number		6.67%	86.67%		0.00%		6.67%		0.00%		0.00%
Algebra		20.00%	73.33%		0.00%		0.00%		0.00%		6.67%
Space		20.00%	20.00%		46.67%		0.00%		0.00%		13.33%
Measurement		20.00%	33.33%		20.00%		0.00%		0.00%		26.67%
Chance&Data		40.00%	20.00%		0.00%		0.00%		0.00%		40.00%
Calhoun North-Perry 5 (11)	11			2.73		1.36		0.18		0.00	
Number		27.27%	63.64%		9.09%		0.00%		0.00%		0.00%
Algebra		27.27%	63.64%		0.00%		0.00%		0.00%		9.09%
Space		18.18%	9.09%		54.55%		9.09%		0.00%		9.09%
Measurement		45.45%	0.00%		45.45%		0.00%		0.00%		9.09%
Chance&Data		54.55%	0.00%		9.09%		9.09%		0.00%		27.27%
Calhoun North-Perry 6 (12)	12			3.17		1.67		0.25		0.00	
Number		25.00%	58.33%		16.67%		0.00%		0.00%		0.00%
Algebra		16.67%	83.33%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	8.33%		50.00%		0.00%		0.00%		8.33%
Measurement		16.67%	8.33%		66.67%		8.33%		0.00%		0.00%
Chance&Data		41.67%	8.33%		0.00%		16.67%		0.00%		33.33%

Table E7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural		ıistructural		Multistructural		Relational		Extended Abstract	No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
Calhoun North-Schroeder 1 (1)*	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
LONGITUDINAL IN YEARS 2 & 3											
—MiC—											
Calhoun North-Perry 1 (1)	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Calhoun North-Perry 2 (2)	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Calhoun North-Perry 3 (7)	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Calhoun North-Perry 4 (4)	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-

*Special education class

Table E7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural		ıistructural		Multistructural		Relational		Extended Abstract	No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
Calhoun North-Perry 5 (2)	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Calhoun North-Perry 6 (3)	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Calhoun North-Schroeder 1 (1)*	0			-		-		-	-	-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-

*Special education class

Table E8

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 3

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
					–MiC–					
Calhoun North-Perry 1 (17)	17	2.01	17	1.84	17	2.08	17	1.59	17	1.82
Calhoun North-Perry 2 (19)	17	1.94	17	1.82	17	1.95	17	1.60	17	1.83
Calhoun North-Perry 3 (21)	19	1.85	19	1.84	19	2.12	19	1.69	19	1.85
Calhoun North-Perry 4 (19)	18	1.94	18	2.03	18	2.37	18	1.81	18	2.07
Calhoun North-Perry 5 (13)	12	2.04	12	1.87	12	2.26	12	1.69	12	2.00
Calhoun North-Perry 6 (15)	14	1.95	14	1.74	14	2.07	14	1.67	14	2.07
Calhoun North-Schroeder 1 (2)*	2	1.75	2	2.00	2	1.94	2	2.13	2	1.86

* Special education class

Table E9

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 3

School-Class *(N)*	**Subscale *(1 = very true; 4 = not true at all)***				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
–MiC–					
Calhoun North-Perry 1 (17)					
Count	17	17	17	17	17
Mean	2.01	1.84	2.08	1.59	1.82
Median	2.00	1.60	2.25	1.50	1.86
Minimum	1.00	1.20	1.00	1.13	1.14
Maximum	2.67	2.80	3.25	2.25	2.43
Std. Deviation	0.53	0.56	0.67	0.36	0.35
Calhoun North-Perry 2 (19)					
Count	17	17	17	17	17
Mean	1.94	1.82	1.95	1.60	1.83
Median	2.00	2.00	1.88	1.50	1.86
Minimum	1.00	1.00	1.00	1.13	1.00
Maximum	2.83	2.60	4.00	2.25	2.57
Std. Deviation	0.50	0.52	0.75	0.40	0.44
Calhoun North-Perry 3 (21)					
Count	19	19	19	19	19
Mean	1.85	1.84	2.12	1.69	1.85
Median	1.83	1.60	1.88	1.50	1.71
Minimum	1.00	1.00	1.00	1.00	1.29
Maximum	2.67	3.80	3.88	2.75	3.14
Std. Deviation	0.53	0.71	0.85	0.52	0.58
Calhoun North-Perry 4 (19)					
Count	18	18	18	18	18
Mean	1.94	2.03	2.37	1.81	2.07
Median	1.83	2.10	2.25	1.75	2.14
Minimum	1.00	1.00	1.25	1.00	1.29
Maximum	2.83	2.80	3.75	2.88	3.29
Std. Deviation	0.54	0.55	0.77	0.50	0.51

Table E9 *(continued)*

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Calhoun North-Perry 5 (13)					
Count	12	12	12	12	12
Mean	2.04	1.87	2.26	1.69	2.00
Median	2.00	1.90	2.44	1.75	1.86
Minimum	1.17	1.00	1.13	1.13	1.57
Maximum	3.17	3.00	3.63	2.75	2.86
Std. Deviation	0.56	0.70	0.91	0.45	0.41
Calhoun North-Perry 6 (15)					
Count	14	14	14	14	14
Mean	1.95	1.74	2.07	1.67	2.07
Median	1.92	1.60	1.81	1.50	1.93
Minimum	1.00	1.20	1.13	1.13	1.33
Maximum	2.83	3.20	3.75	3.00	3.29
Std. Deviation	0.56	0.59	0.88	0.47	0.62
Calhoun North-Schroeder 1 (2)*					
Count	2	2	2	2	2
Mean	1.75	2.00	1.94	2.13	1.86
Median	1.75	2.00	1.94	2.13	1.86
Minimum	1.50	1.80	1.50	1.50	1.57
Maximum	2.00	2.20	2.38	2.75	2.14
Std. Deviation	0.35	0.28	0.62	0.88	0.40

* Special education class

Table E10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 3, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Calhoun North-Perry (104)	95	1.43	97	1.65	97	2.31	97	1.31	97	1.25	95	1.80	95	2.13	97	2.44
Calhoun North-Schroeder (2)*	2	1.50	2	2.00	2	1.50	2	1.50	2	1.00	2	1.50	2	1.00	2	2.00

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Calhoun North-Perry (104)	96	2.76	97	1.74	97	2.06	95	3.04	96	3.03	94	1.68	96	1.51	94	2.82
Calhoun North-Schroeder (2)*	2	3.50	2	1.50	2	2.50	2	3.50	2	4.00	2	1.00	2	2.00	2	3.50

* Special education class

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table E11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 3

School-Class *(N)*	Item Number *(see Key)*																							
	3			**4**			**6**			**11**			**16**			**20**			**27**			**28**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Calhoun North-Perry 1 (17)	17	1.35	0.61	17	1.65	0.70	17	2.53	0.87	17	1.29	0.59	17	1.24	0.44	17	1.59	0.62	16	2.25	1.18	17	2.53	0.80
Calhoun North-Perry 2 (19)	16	1.38	0.72	17	1.82	0.88	17	2.29	0.92	17	1.12	0.33	17	1.06	0.24	16	2.06	1.12	17	1.94	1.14	17	2.29	0.92
Calhoun North-Perry 3 (21)	19	1.26	0.45	19	1.47	0.70	19	2.32	0.95	19	1.21	0.42	19	1.32	0.48	18	1.94	1.00	18	2.17	1.25	19	2.53	1.22
Calhoun North-Perry 4 (19)	17	1.59	0.62	18	1.72	0.57	18	2.56	1.15	18	1.33	0.59	18	1.44	0.51	18	1.89	0.76	18	2.00	0.84	18	2.78	1.11
Calhoun North-Perry 5 (13)	12	1.67	0.78	12	1.67	0.78	12	1.92	1.00	12	1.58	0.79	12	1.25	0.45	12	1.83	0.83	12	2.50	1.38	12	2.00	1.13
Calhoun North-Perry 6 (15)	14	1.43	0.85	14	1.57	0.65	14	2.07	0.83	14	1.43	0.65	14	1.14	0.36	14	1.43	0.65	14	2.00	1.18	14	2.36	0.93
Calhoun North-Schroeder 1 (2)*	2	1.50	0.71	2	2.00	0.00	2	1.50	0.71	2	1.50	0.71	2	1.00	0.00	2	1.50	0.71	2	1.00	0.00	2	2.00	1.41

School-Class *(N)*	**37**			**38**			**39**			**44**			**45**			**49**			**53**			**55**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Calhoun North-Perry 1 (17)	16	2.75	0.77	17	1.71	0.69	17	2.00	0.94	16	3.19	0.54	17	3.53	0.62	17	1.41	0.71	17	1.53	0.87	17	2.59	0.87
Calhoun North-Perry 2 (19)	17	2.94	0.75	17	1.53	0.62	17	2.18	1.01	17	2.82	0.73	17	2.71	0.85	17	1.82	0.95	17	1.41	0.87	16	2.88	0.96
Calhoun North-Perry 3 (21)	19	2.63	1.12	19	1.74	1.05	19	1.79	0.92	19	3.11	0.88	19	2.95	0.91	17	1.71	0.99	19	1.47	0.90	19	2.63	1.07
Calhoun North-Perry 4 (19)	18	3.06	1.16	18	1.78	0.65	18	2.33	0.97	17	3.00	0.71	17	2.82	0.81	17	1.88	0.93	17	1.76	0.90	16	3.19	0.66
Calhoun North-Perry 5 (13)	12	2.67	1.15	12	2.17	1.11	12	2.17	1.03	12	3.25	0.75	12	3.42	0.90	12	1.92	1.00	12	1.42	0.67	12	2.75	0.97
Calhoun North-Perry 6 (15)	14	2.43	0.94	14	1.64	0.93	14	1.93	1.00	14	2.93	0.92	14	2.86	1.03	14	1.36	0.50	14	1.43	0.51	14	2.93	1.07
Calhoun North-Schroeder 1 (2)*	2	3.50	0.71	2	1.50	0.71	2	2.50	0.71	2	3.50	0.71	2	4.00	0.00	2	1.00	0.00	2	2.00	1.41	2	3.50	0.71

* Special education class

Table E11 *(continued)*

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table E12

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 3

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Calhoun North-Perry 1 (17)	17	3.88	17	2.65	17	1.35	17	3.18	17	3.75	17	2.88	17	1.94	17	3.53
Calhoun North-Perry 2 (19)	17	3.76	17	2.94	17	1.41	17	3.00	17	3.71	17	3.24	17	2.29	17	3.65
Calhoun North-Perry 3 (21)	19	3.79	19	2.33	19	1.21	19	3.42	19	3.95	19	2.84	19	2.00	19	3.39
Calhoun North-Perry 4 (19)	18	3.67	18	2.44	18	1.28	18	3.11	18	3.56	18	2.78	18	1.76	18	3.12
Calhoun North-Perry 5 (13)	12	3.67	12	2.25	12	1.50	12	3.25	12	3.75	12	2.83	12	2.33	12	3.42
Calhoun North-Perry 6 (15)	14	3.86	14	2.57	14	1.71	14	3.43	14	3.64	14	3.29	14	2.14	14	3.71
Calhoun North-Schroeder 1 (2)*	2	4.00	2	2.00	2	1.00	2	4.00	2	4.00	2	3.00	2	3.50	2	4.00

* Special education class

Table E13

Student Preference Ranking of Classes in District 3, Grade 7

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
				—MiC—							
Calhoun North-Perry 1 (17)	15	7	13	20	0	0	40	0	20	0	0
Calhoun North-Perry 2 (19)	18	17	11	11	6	0	33	6	17	0	0
Calhoun North-Perry 3 (21)	21	5	0	10	0	19	48	0	14	0	5
Calhoun North-Perry 4 (19)	19	0	21	11	11	0	42	0	16	0	0
Calhoun North-Perry 5 (13)	12	8	8	0	8	0	25	0	33	0	17
Calhoun North-Perry 6 (15)	15	13	20	27	0	0	7	0	20	7	7
Calhoun North-Schroeder 1 (2)[2]	2	0	0	100	0	0	0	0	0	0	0

[1] Other includes mutiple preferences.

[2] Special education class

Note: Response rates designate class mean percents.

Table E14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 3

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— *MiC* —									
Calhoun North-Perry 1 (17)	15	27	53	13	7	15	7	27	47	20	15	40	53	8	0
Calhoun North-Perry 2 (19)	18	17	78	6	0	18	6	56	22	17	18	44	50	0	6
Calhoun North-Perry 3 (21)	21	14	52	33	0	21	0	29	43	29	21	29	48	19	5
Calhoun North-Perry 4 (19)	19	26	47	21	5	19	5	26	63	5	19	32	47	11	11
Calhoun North-Perry 5 (13)	12	33	67	0	0	12	8	42	25	25	12	42	50	8	0
Calhoun North-Perry 6 (15)	15	27	60	7	7	15	20	60	13	7	15	47	40	0	13
Calhoun North-Schroeder 1 (2)*	2	0	50	50	0	2	0	50	50	0	2	0	100	0	0

* Special education class

Note: Response rates designate class mean percents.

APPENDIX E

GRADE 8, DISTRICT 3

Table E1

Fixed Characteristics for Eighth-Grade Classes in District 3

School-Class ***(N)***	**Sex** ***(N)***		**Language Preference** ***(%)*** ***** *(self-identified)*		**Ethnicity** ***(%)*** ****** *(self-identified)*								
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Native American**	**Asian**	**Multi-racial**	**Haitian**	**Other**	**Non-Response**
					—MiC—								
Calhoun North-Wells 1 (16)	6	10	94	0	0	6	88	0	0	6	0	0	0
Calhoun North-Wells 2 (13)	5	8	92	8	0	0	92	0	0	0	0	0	8
Calhoun North-Wells 3 (20)	11	9	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Schroeder 2 (7)***	3	4	100	0	0	0	71	0	14	14	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** Special education classroom.

Table E2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 3

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
—MiC—													
Calhoun North-Wells 1 (14)	4	10	100	0	0	7	93	0	0	0	0	0	0
Calhoun North-Wells 2 (11)	4	7	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Wells 3 (17)	9	8	100	0	0	0	100	0	0	0	0	0	0
Calhoun North-Schroeder 2 (7)***	3	4	100	0	0	0	71	0	14	14	0	0	0
Longitudinal Years 2 & 3													
—MiC—													
Calhoun North-Wells 1 (2)	2	0	50	50	0	0	50	0	0	50	0	0	0
Calhoun North-Wells 2 (2)	1	1	100	0	0	0	50	0	0	0	0	0	50
Calhoun North-Wells 3 (3)	2	1	100	0	0	0	100	0	0	0	0	0	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

*** Special education classroom.

Table E3

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 3

School-Class *(N)*	SAT-9					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
—MiC—						
Calhoun North-Wells 1 (16)	13	35.85	18.72	11	36.0	77
Calhoun North-Wells 2 (13)	13	40.31	17.42	12	40.0	70
Calhoun North-Wells 3 (20)	19	41.74	15.85	6	42.0	68
Calhoun North-Schroeder 2 (7)*	5	18.14	15.86	7	11.0	52

*Special education class

Table E4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 3

School-Class *(N)*	SAT-9					
	(N)	**Mean**	**StDev**	**Min**	**Median**	**Max**
Longitudinal Years 1, 2, & 3						
			—MiC—			
Calhoun North-Wells 1 (14)	11	37.55	18.75	16	36.0	77
Calhoun North-Wells 2 (11)	11	41.45	16.06	21	40.0	70
Calhoun North-Wells 3 (17)	16	39.06	14.58	6	41.0	44
Calhoun North-Schroeder 2 (7)*	5	18.14	15.86	7	11.0	52
Longitudinal Years 2 & 3						
			—MiC—			
Calhoun North-Wells 1 (2)	2	26.50	21.92	11	26.5	42
Calhoun North-Wells 2 (2)	2	34.00	31.11	12	34.0	56
Calhoun North-Wells 3 (3)	3	56.00	17.44	36	64.0	68

*Special education class

Table E5

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 3

School-Class *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
		—MiC—			
Calhoun North-Wells 1 (16)	15	3.33	1.53	0.20	0.07
Calhoun North-Wells 2 (13)	11	2.18	0.91	0.09	0.00
Calhoun North-Wells 3 (20)	18	2.72	1.39	0.22	0.00
Calhoun North-Schroeder 2 (7)*	7	2.00	0.57	0.00	0.00

*Special education class

Table E6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 3

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	Unistructural		Multistructural		Relational		Extended Abstract		No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
—MiC—											
Calhoun North-Wells 1 (16)	15			3.33		1.53		0.20		0.07	
Number		26.67%	53.33%		6.67%		6.67%		0.00%		6.67%
Algebra		46.67%	53.33%		0.00%		0.00%		0.00%		0.00%
Space		13.33%	13.33%		60.00%		6.67%		6.67%		0.00%
Measurement		13.33%	20.00%		66.67%		0.00%		0.00%		0.00%
Chance&Data		46.67%	40.00%		0.00%		0.00%		0.00%		13.33%
Calhoun North-Wells 2 (13)	11			2.18		0.91		0.09		0.00	
Number		36.36%	36.36%		0.00%		9.09%		0.00%		18.18%
Algebra		18.18%	54.55%		0.00%		0.00%		0.00%		27.27%
Space		9.09%	9.09%		54.55%		0.00%		0.00%		27.27%
Measurement		45.45%	9.09%		27.27%		0.00%		0.00%		18.18%
Chance&Data		54.55%	18.18%		0.00%		0.00%		0.00%		27.27%
Calhoun North-Wells 3 (20)	18			2.72		1.39		0.22		0.00	
Number		22.22%	50.00%		0.00%		11.11%		0.00%		16.67%
Algebra		11.11%	66.67%		0.00%		0.00%		0.00%		22.22%
Space		5.56%	0.00%		66.67%		5.56%		0.00%		22.22%
Measurement		11.11%	16.67%		50.00%		0.00%		0.00%		22.22%
Chance&Data		61.11%	16.67%		0.00%		5.56%		0.00%		16.67%
Calhoun North-Schroeder 2 (7)*	7			2.00		0.57		0.00		0.00	
Number		28.57%	57.14%		0.00%		0.00%		0.00%		14.29%
Algebra		57.14%	14.29%		0.00%		0.00%		0.00%		28.57%
Space		28.57%	28.57%		14.29%		0.00%		0.00%		28.57%
Measurement		28.57%	14.29%		42.86%		0.00%		0.00%		14.29%
Chance&Data		42.86%	28.57%		0.00%		0.00%		0.00%		28.57%

*Special education class

Table E7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Eighth-Grade Classes in District 3

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	Unistructural		Multistructural		Relational		Extended Abstract		No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
LONGITUDINAL IN YEARS 1, 2, & 3											
					—MiC—						
Calhoun North-Wells 1 (14)	14			3.36		1.57		0.14		0.07	
Number		28.57%	50.00%		7.14%		7.14%		0.00%		7.14%
Algebra		42.86%	57.14%		0.00%		0.00%		0.00%		0.00%
Space		14.29%	14.29%		64.29%		0.00%		7.14%		0.00%
Measurement		7.14%	21.43%		71.43%		0.00%		0.00%		0.00%
Chance&Data		50.00%	35.71%		0.00%		0.00%		0.00%		14.29%
Calhoun North-Wells 2 (11)	11			2.18		0.91		0.09		0.00	
Number		36.36%	36.36%		0.00%		9.09%		0.00%		18.18%
Algebra		18.18%	54.55%		0.00%		0.00%		0.00%		27.27%
Space		9.09%	9.09%		54.55%		0.00%		0.00%		27.27%
Measurement		45.45%	9.09%		27.27%		0.00%		0.00%		18.18%
Chance&Data		54.55%	18.18%		0.00%		0.00%		0.00%		27.27%
Calhoun North-Wells 3 (17)	17			2.71		1.41		0.24		0.00	
Number		23.53%	47.06%		0.00%		11.76%		0.00%		17.65%
Algebra		11.76%	64.71%		0.00%		0.00%		0.00%		23.53%
Space		5.88%	0.00%		64.71%		5.88%		0.00%		23.53%
Measurement		5.88%	17.65%		52.94%		0.00%		0.00%		23.53%
Chance&Data		58.82%	17.65%		0.00%		5.88%		0.00%		17.65%
Calhoun North-Schroeder 2 (7)*	7			2.00		0.57		0.00		0.00	
Number		28.57%	57.14%		0.00%		0.00%		0.00%		14.29%
Algebra		57.14%	14.29%		0.00%		0.00%		0.00%		28.57%
Space		28.57%	28.57%		14.29%		0.00%		0.00%		28.57%
Measurement		28.57%	14.29%		42.86%		0.00%		0.00%		14.29%
Chance&Data		42.86%	28.57%		0.00%		0.00%		0.00%		28.57%

*Special education class

Table E7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	Unistructural		Multistructural		Relational		Extended Abstract		No Response
		(%)	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*	Ave.	*(%)*
LONGITUDINAL IN YEARS 2 & 3											
				—MiC—							
Calhoun North-Wells 1 (2)	1			3.00		1.00		1.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		0.00%		100.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Calhoun North-Wells 2 (4)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Calhoun North-Wells 3 (3)	1			3.00		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	0.00%		0.00%		0.00%		0.00%		0.00%

Table E8

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 3

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Calhoun North-Wells 1 (16)	13	2.51	13	2.38	13	2.89	13	2.22	13	2.32
Calhoun North-Wells 2 (13)	10	2.40	10	2.34	10	2.87	10	2.01	10	2.32
Calhoun North-Wells 3 (20)	17	2.37	17	2.39	17	2.80	17	2.10	17	2.28
Calhoun North-Schroeder 2 (7)*	7	1.88	7	1.97	7	2.03	7	1.79	7	1.55

* Special education class

Table E9

Eighth-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 3

School-Class *(N)*	Subscale *(1 = very true; 4 = not true at all)*				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
		–MiC–			
Calhoun North-Wells 1(16)					
Count	13.00	13.00	13.00	13.00	13.00
Mean	2.51	2.38	2.89	2.22	2.32
Median	2.50	2.40	2.88	2.25	2.43
Minimum	1.67	2.00	2.13	1.50	1.57
Maximum	3.17	2.80	4.00	3.38	2.86
Std. Deviation	0.44	0.26	0.59	0.55	0.45
Calhoun North-Wells 2 (13)					
Count	10.00	10.00	10.00	10.00	10.00
Mean	2.40	2.34	2.87	2.01	2.32
Median	2.33	2.40	2.88	1.81	2.23
Minimum	1.50	1.60	1.88	1.63	1.71
Maximum	3.17	3.40	3.63	2.75	3.14
Std. Deviation	0.52	0.57	0.59	0.42	0.43
Calhoun North-Wells 3 (20)					
Count	17.00	17.00	17.00	17.00	17.00
Mean	2.37	2.39	2.80	2.10	2.28
Median	2.33	2.40	3.00	1.88	2.00
Minimum	1.67	1.60	1.13	1.13	1.57
Maximum	3.17	3.80	4.00	3.38	3.57
Std. Deviation	0.44	0.55	0.76	0.62	0.64
Calhoun North-Schroeder 2 (7)*					
Count	7.00	7.00	7.00	7.00	7.00
Mean	1.88	1.97	2.03	1.79	1.55
Median	1.83	2.00	2.25	2.00	1.57
Minimum	1.50	1.00	1.25	1.13	1.00
Maximum	2.50	3.20	2.50	2.25	2.57
Std. Deviation	0.39	0.67	0.54	0.48	0.54

* Special education class

Table E10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 3, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Calhoun North-Wells (49)	39	1.95	40	2.13	40	2.43	40	1.58	40	1.45	40	1.80	40	2.28	40	3.05
Calhoun North-Schroeder (7)*	7	1.14	7	1.71	7	2.86	7	1.00	7	1.29	7	1.71	7	2.57	7	2.14

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
—MiC—																
Calhoun North-Wells (49)	40	2.85	40	1.93	40	2.13	40	2.93	40	2.35	40	1.95	40	1.85	40	2.83
Calhoun North-Schroeder (7)*	7	3.43	7	2.43	6	2.50	7	3.00	7	2.43	7	2.43	6	2.17	7	3.29

* Special education class

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table E11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 3

School-Class *(N)*	Item Number *(see Key)*																							
	3			**4**			**6**			**11**			**16**			**20**			**27**			**28**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Calhoun North-Wells 1 (16)	12	1.92	0.67	13	2.00	0.82	13	2.54	0.97	13	1.46	0.66	13	1.54	0.66	13	2.15	0.99	13	2.08	1.04	13	3.08	0.86
Calhoun North-Wells 2 (13)	10	1.90	0.74	10	2.10	0.74	10	2.50	1.18	10	1.70	0.67	10	1.40	0.52	10	1.60	0.70	10	2.40	1.17	10	3.20	1.03
Calhoun North-Wells 3 (20)	17	2.00	0.87	17	2.24	0.97	17	2.29	0.92	17	1.59	0.80	17	1.41	0.87	17	1.65	0.93	17	2.35	1.17	17	2.94	1.09
Calhoun North-Schroeder 2 (7)	7	1.14	0.38	7	1.71	1.11	7	2.86	0.69	7	1.00	0.00	7	1.29	0.49	7	1.71	1.25	7	2.57	1.27	7	2.14	1.07

School-Class *(N)*	**37**			**38**			**39**			**44**			**45**			**49**			**53**			**55**		
	(N)	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**	***(N)***	**Mean**	**StD**
—MiC—																								
Calhoun North-Wells 1 (16)	13	2.85	1.14	13	1.85	0.69	13	2.00	0.71	13	2.69	0.75	13	2.46	0.88	13	1.77	0.73	13	2.00	0.91	13	3.15	0.80
Calhoun North-Wells 2 (13)	10	3.10	1.10	10	2.30	0.95	10	2.40	0.84	10	3.20	0.42	10	2.00	1.25	10	2.40	1.07	10	1.80	0.79	10	2.90	0.57
Calhoun North-Wells 3 (20)	17	2.71	1.10	17	1.76	0.83	17	2.06	0.83	17	2.94	0.75	17	2.47	1.18	17	1.82	1.01	17	1.76	0.90	17	2.53	0.87
Calhoun North-Schroeder 2 (7)	7	3.43	0.79	7	2.43	1.27	6	2.50	1.05	7	3.00	1.00	7	2.43	0.98	7	2.43	1.27	6	2.17	1.17	7	3.29	1.11

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table E12

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 3

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Calhoun North-Wells 1 (16)	13	3.69	13	2.85	13	1.46	13	2.85	13	3.33	13	2.62	13	2.23	13	3.46
Calhoun North-Wells 2 (13)	10	3.60	10	3.10	10	1.60	10	3.20	10	3.70	10	2.90	10	2.50	10	3.40
Calhoun North-Wells 3 (20)	17	3.94	17	3.18	17	1.47	17	3.24	17	3.53	17	2.82	17	2.41	17	3.53
Calhoun North-Schroeder 2 (7)	7	3.57	7	2.71	7	1.14	7	3.14	7	3.86	7	3.14	7	1.86	7	2.86

Table E13

Student Preference Ranking of Classes in District 3, Grade 8

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—						
Calhoun North-Wells 1 (16)[2]	0	--	--	--	--	--	--	--	--	--	--
Calhoun North-Wells 2 (13)[2]	0	--	--	--	--	--	--	--	--	--	--
Calhoun North-Wells 3 (20)[2]	0	--	--	--	--	--	--	--	--	--	--
Calhoun North-Schroeder 2 (7)[3]	7	0	14	0	0	0	29	0	0	0	57

[1] Other includes mutiple preferences.

[2] Preference data was not available.

[3] Special education class

Note: Response rates designate class mean percents.

Table E14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 3

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— *MiC* —									
Calhoun North-Wells 1 (16)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Calhoun North-Wells 2 (13)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Calhoun North-Wells 3 (20)	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Calhoun North-Schroeder 2 (7)*	7	0	100	0	0	7	0	57	29	14	7	29	57	14	0

Note: Response rates designate class mean percents.

APPENDIX F

GRADE 7, DISTRICT 4

Table F1

Fixed Characteristics for Seventh-Grade Classes in District 4

School-Class *(N)*	**Sex *(N)***		**Language Preference *(%)* *** *(self-identified)*		**Ethnicity *(%)* **** *(self-identified)*								
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Native American**	**Asian**	**Multi-racial**	**Haitian**	**Other**	**Non-Response**
					—MiC—								
Kelvyn Park-Kane 1 (10)	4	6	80	0	0	20	20	0	10	30	0	20	0
Kelvyn Park-Kane 2 (4)	1	3	100	0	50	0	0	0	25	25	0	0	0
Kelvyn Park-Lux 1 (8)	5	3	100	0	38	13	0	0	0	25	0	25	0
Kelvyn Park-Lux 2 (5)	2	3	100	0	60	20	0	0	0	0	0	20	0
Kelvyn Park-Woodward 1 (1)	1	0	100	0	0	0	0	0	0	0	0	100	0
Kelvyn Park-Woodward 2 (16)	9	7	100	0	19	25	0	0	0	13	0	44	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table F2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 4

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
—MiC—													
Kelvyn Park-Lux 1 (1)	1	0	100	0	100	0	0	0	0	0	0	0	0
Longitudinal Years 2 & 3													
—MiC—													
Kelvyn Park-Kane 1 (10) L	4	6	80	0	0	20	20	0	10	30	0	20	0
Kelvyn Park-Kane 2 (4) L	1	3	100	0	50	0	0	0	25	25	0	0	0
Kelvyn Park-Lux 1 (7)	4	3	100	0	29	14	0	0	0	29	0	29	0
Kelvyn Park-Lux 2 (5)	2	3	100	0	60	20	0	0	0	0	0	20	0
Kelvyn Park-Woodward 1 (1)	1	0	100	0	0	0	0	0	0	0	0	100	0
Kelvyn Park-Woodward 2 (16)	9	7	100	0	19	25	0	0	0	13	0	44	0

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table F3

Background Standardized Test Scores, Spring 1999, for Seventh-Grade Classes in District 4

School-Class *(N)*	TerraNova - City CTB Mathematics Test															
	Scale Score						National Percentile					Raw Score				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
—MiC—																
Kelvyn Park-Kane 1 (10) L	10	667.30	19.24	628	668.5	696	53.80	17.51	20	54.5	81	30.10	5.51	19	30.5	38
Kelvyn Park-Kane 2 (4) L	4	682.75	17.23	660	685.5	700	67.75	16.09	46	71.0	83	34.50	4.80	28	35.5	39
Kelvyn Park-Lux 1 (8)	8	663.50	16.88	636	665.0	691	48.50	13.32	25	51.0	64	28.25	3.99	21	29.5	32
Kelvyn Park-Lux 2 (5)	5	651.40	16.40	624	654.0	664	39.40	13.11	18	41.0	50	25.40	4.51	18	26.0	29
Kelvyn Park-Woodward 1 (1)	1	664.00	-	664	664	664	50.00	-	50	50	50	29.00	-	29	29	29
Kelvyn Park-Woodward 2 (16)	15	660.27	18.54	632	660.0	696	45.60	16.16	23	44.0	81	27.20	5.09	20	26.0	38

Table F4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Seventh-Grade Classes in District 4

School-Class *(N)*	TerraNova - City CTB Mathematics Test															
	Scale Score						National Percentile					Raw Score				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
Longitudinal Years 1, 2, & 3																
—MiC—																
Kelvyn Park-Lux 1 (1)	1	691.00	-	691	691.0	691	64.00	-	64	64.0	64	31.00	-	31	31.0	31
Longitudinal Years 2 & 3																
—MiC—																
Kelvyn Park-Kane 1 (10) L	10	667.30	19.24	628	668.5	696	53.80	17.51	20	54.5	81	30.10	5.51	19	30.5	38
Kelvyn Park-Kane 2 (4) L	4	682.75	17.23	660	685.5	700	67.75	16.09	46	71.0	83	34.50	4.80	28	35.5	39
Kelvyn Park-Lux 1 (7)	7	659.57	13.72	636	660.0	673	46.29	12.70	25	46.0	59	27.86	4.14	21	28.0	32
Kelvyn Park-Lux 2 (5)	5	651.40	16.40	624	654.0	664	39.40	13.11	18	41.0	50	25.40	4.51	18	26.0	29
Kelvyn Park-Woodward 1 (1)	1	664.00	-	664	664.0	664	50.00	-	50	50.0	50	29.00	-	29	29.0	29
Kelvyn Park-Woodward 2 (16)	15	660.27	18.54	632	660.0	696	45.60	16.16	23	44.0	81	27.20	5.09	20	26.0	38

Table F5

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 4

School-Class *(N)*	Level of Student Performance				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Kelvyn Park-Kane 1 (10)	10	2.20	0.70	0.20	0.00
Kelvyn Park-Kane 2 (4)	4	4.00	1.75	0.25	0.00
Kelvyn Park-Lux 1 (8)	7	3.43	0.71	0.14	0.00
Kelvyn Park-Lux 2 (5)	4	3.00	0.50	0.25	0.00
Kelvyn Park-Woodward 1 (1)	1	3.00	0.00	0.00	0.00
Kelvyn Park-Woodward 2 (16)	14	2.07	0.57	0.00	0.00

Table F6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Seventh-Grade Classes in District 4

School-Class *(N)*	Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	No Response *(%)*
—MiC—										
Kelvyn Park-Kane 1 (10)	10			2.20		0.70		0.20		0.00
Number		20.00%	70.00%		10.00%		0.00%		0.00%	0.00%
Algebra		60.00%	40.00%		0.00%		0.00%		0.00%	0.00%
Space		30.00%	30.00%		20.00%		20.00%		0.00%	0.00%
Measurement		80.00%	0.00%		20.00%		0.00%		0.00%	0.00%
Chance&Data		90.00%	10.00%		0.00%		0.00%		0.00%	0.00%
Kelvyn Park-Kane 2 (4)	4			4.00		1.75		0.25		0.00
Number		0.00%	75.00%		0.00%		25.00%		0.00%	0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%	0.00%
Space		0.00%	25.00%		75.00%		0.00%		0.00%	0.00%
Measurement		0.00%	25.00%		75.00%		0.00%		0.00%	0.00%
Chance&Data		75.00%	25.00%		0.00%		0.00%		0.00%	0.00%
Kelvyn Park-Lux 1 (8)	7			3.43		0.71		0.14		0.00
Number		14.29%	71.43%		14.29%		0.00%		0.00%	0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Space		14.29%	57.14%		14.29%		14.29%		0.00%	0.00%
Measurement		42.86%	28.57%		28.57%		0.00%		0.00%	0.00%
Chance&Data		85.71%	14.29%		0.00%		0.00%		0.00%	0.00%
Kelvyn Park-Lux 2 (5)	4			3.00		0.50		0.25		0.00
Number		0.00%	75.00%		0.00%		25.00%		0.00%	0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%	0.00%
Space		50.00%	50.00%		0.00%		0.00%		0.00%	0.00%
Measurement		25.00%	50.00%		25.00%		0.00%		0.00%	0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Kelvyn Park-Woodward 1 (1)	1			3.00	`	0.00		0.00		0.00
Number		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Space		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%	0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%	0.00%

Table F6 *(continued)*

School-Class *(N)*	**Level of Student Performance**									
	(N)	**Prestructural**	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**	**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
Kelvyn Park-Woodward 2 (16	14			2.07		0.57		0.00		0.00	
Number		28.57%	64.29%		7.14%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	21.43%		28.57%		0.00%		0.00%		0.00%
Measurement		64.29%	14.29%		21.43%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%

Table F7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Seventh-Grade Classes in District 4

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
LONGITUDINAL IN YEARS 1, 2, & 3											
					—MiC—						
Kelvyn Park-Lux 1 (1)	1			3.00		0.00		0.00		0.00	
Number		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
LONGITUDINAL IN YEARS 2&3											
					—MiC—						
Kelvyn Park-Kane 1 (10)	10			2.20		0.70		0.20		0.00	
Number		20.00%	70.00%		10.00%		0.00%		0.00%		0.00%
Algebra		60.00%	40.00%		0.00%		0.00%		0.00%		0.00%
Space		30.00%	30.00%		20.00%		20.00%		0.00%		0.00%
Measurement		80.00%	0.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		90.00%	10.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Kane 2 (4)	4			4.00		1.75		0.25		0.00	
Number		0.00%	75.00%		0.00%		25.00%		0.00%		0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	25.00%		75.00%		0.00%		0.00%		0.00%
Measurement		0.00%	25.00%		75.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Lux 1 (7)	6			3.50		0.83		0.17		0.00	
Number		0.00%	83.33%		16.67%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		16.67%	50.00%		16.67%		16.67%		0.00%		0.00%
Measurement		50.00%	16.67%		33.33%		0.00%		0.00%		0.00%
Chance&Data		83.33%	16.67%		0.00%		0.00%		0.00%		0.00%

Table F7 *(continued)*

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
Kelvyn Park-Lux 2 (5)	4			3.00		0.50		0.25		0.00	
Number		0.00%	75.00%		0.00%		25.00%		0.00%		0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Measurement		25.00%	50.00%		25.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Woodward 1 (1)	1			3.00		0.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Woodward 2 (16)	14			2.07		0.57		0.00		0.00	
Number		28.57%	64.29%		7.14%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	21.43%		28.57%		0.00%		0.00%		0.00%
Measurement		64.29%	14.29%		21.43%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%

Table F8

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 4

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
					–MiC–					
Kelvyn Park-Kane 1 (10)	9	1.67	9	1.91	9	2.07	9	1.60	9	1.75
Kelvyn Park-Kane 2 (4)	4	1.04	4	1.25	4	1.41	4	1.31	4	1.39
Kelvyn Park-Lux 1 (8)	7	1.76	7	1.91	7	1.91	7	1.68	7	2.04
Kelvyn Park-Lux 2 (5)	4	2.21	4	2.30	4	2.31	4	1.44	4	2.25
Kelvyn Park-Woodward 1 (1)	1	1.83	1	2.80	1	2.00	1	2.13	1	2.29
Kelvyn Park-Woodward 2 (16)	14	1.73	14	2.07	14	1.85	14	1.80	14	2.00

Table F9

Seventh-Grade Class Data on Five Subscales of the Student Attitude Inventory in District 4

School-Class *(N)*		**Subscale** ***(1 = very true; 4 = not true at all)***				
		Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
		–MiC–				
Kelvyn Park-Kane 1 (10) L						
	Count	9	9	9	9	9
	Mean	1.67	1.91	2.07	1.60	1.75
	Median	1.33	1.80	1.88	1.63	1.71
	Minimum	1.00	1.50	1.25	1.13	1.29
	Maximum	3.17	2.60	3.25	2.00	2.29
	Std. Deviation	0.71	0.37	0.71	0.35	0.29
Kelvyn Park-Kane 2 (4) L						
	Count	4	4	4	4	4
	Mean	1.04	1.25	1.41	1.31	1.39
	Median	1.00	1.10	1.13	1.31	1.36
	Minimum	1.00	1.00	1.00	1.25	1.14
	Maximum	1.17	1.80	2.38	1.38	1.71
	Std. Deviation	0.08	0.38	0.65	0.07	0.24
Kelvyn Park-Lux 1 (8)						
	Count	7	7	7	7	7
	Mean	1.76	1.91	1.91	1.68	2.04
	Median	1.83	2.00	2.13	1.63	2.00
	Minimum	1.33	1.40	1.00	1.25	1.29
	Maximum	2.33	2.60	3.00	2.13	3.00
	Std. Deviation	0.32	0.43	0.65	0.35	0.55
Kelvyn Park-Lux 2 (5)						
	Count	4	4	4	4	4
	Mean	2.21	2.30	2.31	1.44	2.25
	Median	2.25	2.40	2.44	1.38	2.14
	Minimum	1.83	1.80	1.00	1.25	1.71
	Maximum	2.50	2.60	3.38	1.75	3.00
	Std. Deviation	0.28	0.35	1.01	0.22	0.55

Table F9 *(continued)*

School-Class *(N)*		Subscale *(1 = very true; 4 = not true at all)*				
		Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
Kelvyn Park-Woodward 1 (1)						
	Count	1	1	1	1	1
	Mean	1.83	2.80	2.00	2.13	2.29
	Median	1.83	2.80	2.00	2.13	2.29
	Minimum	1.83	2.80	2.00	2.13	2.29
	Maximum	1.83	2.80	2.00	2.13	2.29
	Std. Deviation	–	–	–	–	–
Kelvyn Park-Woodward 2 (16)						
	Count	14	14	14	14	14
	Mean	1.73	2.07	1.85	1.80	2.00
	Median	1.75	2.00	1.81	1.81	2.14
	Minimum	1.00	1.20	1.00	1.13	1.00
	Maximum	2.33	3.20	2.88	2.38	2.86
	Std. Deviation	0.41	0.50	0.60	0.35	0.58

Table F10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 4, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
								—MiC—								
Kelvyn Park-Kane (14)	13	1.31	13	1.31	13	2.15	12	1.08	13	1.15	13	1.46	12	1.83	12	2.25
Kelvyn Park-Lux (13)	11	1.55	11	1.64	11	1.91	11	1.18	11	1.55	11	1.45	11	1.91	10	2.00
Kelvyn Park-Woodward (17)	15	1.47	15	1.53	15	2.20	14	1.21	15	1.20	15	1.60	15	2.33	15	2.27

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
								—MiC—								
Kelvyn Park-Kane (14)	12	2.08	12	1.42	12	1.75	12	3.00	12	3.00	12	1.83	12	1.67	11	3.09
Kelvyn Park-Lux (13)	11	2.09	11	1.64	11	2.36	11	3.36	11	2.27	11	1.55	11	1.55	15	2.20
Kelvyn Park-Woodward (17)	15	2.47	14	1.64	15	2.13	15	3.33	15	3.07	15	1.73	15	2.07	16	3.13

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table F11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 7, District 4

School-Class *(N)*	Item Number *(see Key)*																							
	3			4			6			11			16			20			27			28		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
											—MiC—													
Kelvyn Park-Kane 1 (10)	9	1.44	0.53	9	1.33	0.50	9	2.44	1.01	8	1.13	0.35	9	1.22	0.44	9	1.44	0.53	8	1.75	0.89	8	2.50	0.93
Kelvyn Park-Kane 2 (4)	4	1.00	0.00	4	1.25	0.50	4	1.50	1.00	4	1.00	0.00	4	1.00	0.00	4	1.50	0.58	4	2.00	1.15	4	1.75	0.96
Kelvyn Park-Lux 1 (8)	7	1.57	0.79	7	1.43	0.53	7	2.00	0.58	7	1.14	0.38	7	1.57	0.79	7	1.29	0.76	7	1.57	0.98	6	1.83	1.17
Kelvyn Park-Lux 2 (5)	4	1.50	1.00	4	2.00	1.41	4	1.75	0.50	4	1.25	0.50	4	1.50	0.58	4	1.75	1.50	4	2.50	1.29	4	2.25	0.96
Kelvyn Park-Woodward 1 (1)	1	2.00	.	1	2.00	.	1	2.00	.	1	1.00	.	1	1.00	.	1	2.00	.	1	3.00	.	1	1.00	.
Kelvyn Park-Woodward 2 (16)	14	1.43	0.65	14	1.50	0.85	14	2.21	0.89	13	1.23	0.44	14	1.21	0.43	14	1.57	0.76	14	2.29	1.33	14	2.36	1.08

School-Class *(N)*	37			38			39			44			45			49			53			55		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
											—MiC—													
Kelvyn Park-Kane 1 (10)	8	2.25	1.16	8	1.38	0.74	8	1.88	0.83	8	3.13	0.99	8	3.25	0.71	8	2.25	1.04	8	1.88	0.83	4	3.00	1.41
Kelvyn Park-Kane 2 (4)	4	1.75	0.96	4	1.50	0.58	4	1.50	0.58	4	2.75	1.26	4	2.50	1.29	4	1.00	0.00	4	1.25	0.50	7	3.14	0.90
Kelvyn Park-Lux 1 (8)	7	1.86	0.69	7	1.71	0.95	7	2.86	0.90	7	3.43	0.53	7	2.14	0.69	7	1.71	1.11	7	1.86	0.90	4	2.00	1.41
Kelvyn Park-Lux 2 (5)	4	2.50	1.29	4	1.50	0.58	4	1.50	0.58	4	3.25	0.96	4	2.50	1.73	4	1.25	0.50	4	1.00	0.00	11	2.27	1.10
Kelvyn Park-Woodward 1 (1)	1	2.00	.	1	3.00	.	1	1.00	.	1	3.00	.	1	4.00	.	1	2.00	.	1	1.00	.	14	3.29	0.99
Kelvyn Park-Woodward 2 (16)	14	2.50	0.85	13	1.54	0.66	14	2.21	1.12	14	3.36	0.74	14	3.00	1.11	14	1.71	1.14	14	2.14	1.10	2	2.00	0.00

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table F12

Seventh-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 4

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Kelvyn Park-Kane 1 (10)	9	3.67	9	3.00	9	1.50	9	3.50	9	3.25	9	3.44	9	2.38	9	3.50
Kelvyn Park-Kane 2 (4)	4	4.00	4	2.50	4	1.00	4	4.00	4	4.00	4	2.75	4	1.50	4	4.00
Kelvyn Park-Lux 1 (8)	7	4.00	7	2.71	7	1.57	7	3.57	7	3.71	7	2.57	7	2.43	7	3.71
Kelvyn Park-Lux 2 (5)	4	4.00	4	3.25	4	1.00	4	3.50	4	4.00	4	3.00	4	1.75	4	3.75
Kelvyn Park-Woodward 1 (1)	1	4.00	1	4.00	1	1.00	1	3.00	1	1.00	1	1.00	1	3.00	1	4.00
Kelvyn Park-Woodward 2 (16)	14	3.64	14	3.38	14	1.36	14	3.57	14	3.79	14	3.00	14	1.93	14	3.77

Table F13

Student Preference Ranking of Classes in District 4, Grade 7

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—						
Kelvyn Park-Kane 1 (10)	10	20	0	50	10	0	10	0	10	0	0
Kelvyn Park-Kane 2 (4)	3	0	33	0	33	0	0	0	33	0	0
Kelvyn Park-Lux 1 (8)	7	14	0	0	14	14	14	0	29	0	14
Kelvyn Park-Lux 2 (5)	4	20	0	20	0	0	0	0	60	0	0
Kelvyn Park-Woodward 1 (1)	1	0	0	100	0	0	0	0	0	0	0
Kelvyn Park-Woodward 2 (16)	13	8	15	38	0	0	8	8	23	0	0

[1] Other includes mutiple preferences.

Note: Response rates designate class mean percents.

Table F14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Seventh-Grade Classes in District 4.

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— *MiC* —									
Kelvyn Park-Kane 1 (10)	10	40	40	20	0	10	0	40	30	30	10	0	10	30	60
Kelvyn Park-Kane 2 (4)	3	33	67	0	0	3	0	67	33	0	3	0	67	33	0
Kelvyn Park-Lux 1 (8)	7	14	86	0	0	7	14	14	71	0	7	29	29	29	14
Kelvyn Park-Lux 2 (5)	5	0	80	20	0	5	20	20	40	20	5	0	20	40	40
Kelvyn Park-Woodward 1 (1)	1	0	0	0	100	1	0	0	100	0	1	0	0	0	100
Kelvyn Park-Woodward 2 (16)	13	8	62	15	15	13	15	31	31	23	13	8	39	46	8

Note: Response rates designate class mean percents.

APPENDIX F

GRADE 8, DISTRICT 4

Table F1

Fixed Characteristics for Eighth-Grade Classes in District 4

School-Class *(N)*	**Sex *(N)***		**Language Preference *(%)* *** *(self-identified)*		**Ethnicity *(%)* **** *(self-identified)*								
	Female	**Male**	**English Preference**	**Non-Response**	**African American**	**Hispanic**	**White**	**Native American**	**Asian**	**Multi-racial**	**Haitian**	**Other**	**Non-Response**
—MiC—													
Kelvyn Park-Downer 1 (16)	5	11	94	0	19	13	6	6	0	19	0	38	0
Kelvyn Park-Downer 2 (5)	2	3	100	0	60	20	0	0	0	0	0	20	0
Kelvyn Park-Novak 1 (16)	10	6	75	6	38	25	0	0	0	19	0	6	12
Kelvyn Park-Novak 2 (22)	13	9	86	14	36	18	5	5	0	14	0	9	14
Kelvyn Park-Woods 1 (20)	15	5	80	0	15	55	0	0	0	15	0	10	5

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table F2

Fixed Characteristics for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 4

School-Class *(N)*	Sex *(N)*		Language Preference *(%)* * *(self-identified)*		Ethnicity *(%)* ** *(self-identified)*								
	Female	Male	English Preference	Non-Response	African American	Hispanic	White	Native American	Asian	Multi-racial	Haitian	Other	Non-Response
Longitudinal Years 1, 2, & 3													
—MiC—													
Kelvyn Park-Downer 1 (6)	3	3	100	0	17	0	17	0	0	17	0	50	0
Kelvyn Park-Downer 2 (1)	0	1	100	0	0	100	0	0	0	0	0	0	0
Kelvyn Park-Novak 1 (1)	0	1	100	0	100	0	0	0	0	0	0	0	0
Kelvyn Park-Novak 2 (4)	2	2	100	0	25	25	0	0	0	0	0	50	0
Kelvyn Park-Woods 1 (5)	4	1	100	0	40	20	0	0	0	40	0	0	0
Longitudinal Years 2 & 3													
—MiC—													
Kelvyn Park-Downer 1 (10)	2	8	90	0	20	20	0	10	0	20	0	30	0
Kelvyn Park-Downer 2 (4)	2	2	100	0	75	0	0	0	0	0	0	25	0
Kelvyn Park-Novak 1 (15)	10	5	73	7	33	27	0	0	0	20	0	7	13
Kelvyn Park-Novak 2 (18)	11	7	83	17	39	17	6	6	0	17	0	0	17
Kelvyn Park-Woods 1 (15)	11	4	73	0	7	67	0	0	0	7	0	13	7

* Percent does not add to 100% when students identified a language preference other than English.

** Percent on ethnicity was rounded off and does not always total 100. Multi/Other comprises Asian, Haitian, Native American, Multiracial and Other.

Table F3

Background Standardized Test Scores, Spring 1999, for Eighth-Grade Classes in District 4

School-Class *(N)*	TerraNova - City CTB Mathematics Test															
	Scale Score						National Percentile					Raw Score				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
						—MiC—										
Kelvyn Park-Downer 1 (16)	15	669.07	23.34	617	674.0	701	44.33	18.87	9	47.0	72	25.40	5.51	15	26.0	34
Kelvyn Park-Downer 2 (5)	5	683.00	24.02	648	691.0	708	56.20	21.50	25	64.0	78	29.00	6.44	20	31.0	36
Kelvyn Park-Novak 1 (16)	11	673.55	11.54	658	674.0	691	47.18	10.84	33	47.0	64	26.09	3.14	22	26.0	31
Kelvyn Park-Novak 2 (22)	17	687.47	31.30	643	688.0	732	59.24	25.22	22	60.0	91	29.94	8.01	19	30.0	41
Kelvyn Park-Woods 1 (20)	18	681.33	22.47	631	684	726	53.78	18.83	14	56	88	28.39	5.842	17	29	40

Table F4

Background Standardized Test Scores, Spring 1999, for Three-Year and Two-Year Longitudinal Students in Eighth-Grade Classes in District 4

School-Class *(N)*	TerraNova - City CTB Mathematics Test															
	Scale Score						National Percentile					Raw Score				
	(N)	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max	Mean	StDev	Min	Median	Max
Longitudinal Years 1, 2, & 3																
—MiC—																
Kelvyn Park-Downer 1 (6)	6	663.67	26.13	617	666.0	691	40.33	19.36	9	40.0	64	24.17	5.67	15	24.0	31
Kelvyn Park-Downer 2 (1)	1	708.00	-	708	708.0	708	78.00	-	78	78.0	78	36.00	-	36	36.0	36
Kelvyn Park-Novak 1 (1)	1	670.00	-	670	670.0	670	44.00	-	44	44.0	44	25.00	-	25	25.0	25
Kelvyn Park-Novak 2 (4)	4	689.50	233.91	681	689.5	698	62.00	21.38	54	62.0	70	30.50	9.45	28	30.5	33
Kelvyn Park-Woods 1 (5)	5	677.60	29.3138	631	684	712	51.40	24.08	14	56	81	27.80	7.155	17	29	37
Longitudinal Years 2 & 3																
—MiC—																
Kelvyn Park-Downer 1 (10)	9	672.67	22.14	637	681.0	701	47.00	19.20	18	54.0	72	26.22	5.59	18	28.0	34
Kelvyn Park-Downer 2 (4)	4	676.75	22.56	648	680.5	698	50.75	20.45	25	54.0	70	27.25	5.91	20	28.0	33
Kelvyn Park-Novak 1 (15)	10	673.90	12.10	658	675.5	691	47.50	11.37	33	48.5	64	26.20	-	25	25.0	25
Kelvyn Park-Novak 2 (17)	13	686.85	31.30	643	688.0	732	58.38	25.22	22	60.0	91	29.77	8.01	19	30.0	41
Kelvyn Park-Woods 1 (15)	13	682.77	20.52	658	688.0	726	54.69	17.48	33	60.0	88	28.62	5.58	22	30.0	40

Table F5

Class Means on the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 4

School-Class *(N)*	**Level of Student Performance**				
	(N)	**Unistructural Average**	**Multistructural Average**	**Relational Average**	**Extended Abstract Average**
			—MiC—		
Kelvyn Park-Downer 1 (16)	10	2.80	0.70	0.10	0.00
Kelvyn Park-Downer 2 (5)	1	3.00	1.00	0.00	0.00
Kelvyn Park-Novak 1 (16)	7	2.86	0.86	0.14	0.00
Kelvyn Park-Novak 2 (22)	11	3.64	1.91	0.55	0.09
Kelvyn Park-Woods 1 (20)	9	3.22	1.33	0.22	0.00

Table F6

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Eighth-Grade Classes in District 4

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
					—MiC—						
Kelvyn Park-Downer 1 (16)	10			2.80		0.70		0.10		0.00	
Number		10.00%	80.00%		0.00%		10.00%		0.00%		0.00%
Algebra		30.00%	70.00%		0.00%		0.00%		0.00%		0.00%
Space		40.00%	20.00%		40.00%		0.00%		0.00%		0.00%
Measurement		50.00%	30.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		90.00%	10.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Downer 2 (5)	1			3.00		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Novak 1 (16)	7			2.86		0.86		0.14		0.00	
Number		0.00%	85.71%		14.29%		0.00%		0.00%		0.00%
Algebra		57.14%	42.86%		0.00%		0.00%		0.00%		0.00%
Space		42.86%	14.29%		28.57%		14.29%		0.00%		0.00%
Measurement		42.86%	28.57%		28.57%		0.00%		0.00%		0.00%
Chance&Data		71.43%	28.57%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Novak 2 (22)	11			3.64		1.91		0.55		0.09	
Number		0.00%	45.45%		27.27%		18.18%		9.09%		0.00%
Algebra		27.27%	63.64%		0.00%		9.09%		0.00%		0.00%
Space		18.18%	27.27%		45.45%		9.09%		0.00%		0.00%
Measurement		9.09%	18.18%		63.64%		9.09%		0.00%		0.00%
Chance&Data		81.82%	18.18%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Woods 1 (20)	9			3.22		1.33		0.22		0.00	
Number		0.00%	66.67%		11.11%		22.22%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	22.22%		44.44%		0.00%		0.00%		0.00%
Measurement		22.22%	33.33%		44.44%		0.00%		0.00%		0.00%
Chance&Data		77.78%	0.00%		11.11%		0.00%		0.00%		11.11%

Table F7

Results of the Collis-Romberg Mathematical Problem-Solving Profiles for Longitudinal Students in Eighth-Grade Classes in District 4

School-Class *(N)*		Level of Student Performance									
	(N)	Prestructural *(%)*	Unistructural *(%)*	Ave.	Multistructural *(%)*	Ave.	Relational *(%)*	Ave.	Extended Abstract *(%)*	Ave.	No Response *(%)*
LONGITUDINAL IN YEARS 1, 2, & 3											
					—MiC—						
Kelvyn Park-Downer 1 (6)	6			2.83		0.67		0.00		0.00	
Number		16.67%	83.33%		0.00%		0.00%		0.00%		0.00%
Algebra		33.33%	66.67%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	16.67%		50.00%		0.00%		0.00%		0.00%
Measurement		50.00%	33.33%		16.67%		0.00%		0.00%		0.00%
Chance&Data		83.33%	16.67%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Downer 2 (1)	1			3.00		1.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Novak 1 (1)	1			3.00		0.00		0.00		0.00	
Number		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Algebra		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Space		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Measurement		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Chance&Data		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Novak 2 (4)	4			3.50		2.00		0.00		0.00	
Number		0.00%	50.00%		50.00%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		25.00%	0.00%		75.00%		0.00%		0.00%		0.00%
Measurement		0.00%	25.00%		75.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	25.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Woods 1 (5)	5			2.40		0.60		0.20		0.00	
Number		0.00%	60.00%		20.00%		20.00%		0.00%		0.00%
Algebra		60.00%	40.00%		0.00%		0.00%		0.00%		0.00%
Space		60.00%	40.00%		0.00%		0.00%		0.00%		0.00%
Measurement		40.00%	40.00%		20.00%		0.00%		0.00%		0.00%
Chance&Data		80.00%	0.00%		0.00%		0.00%		0.00%		20.00%

Table F7 *(continued)*

School-Class *(N)*	*(N)*	Level of Student Performance									
		Prestructural	**Unistructural**		**Multistructural**		**Relational**		**Extended Abstract**		**No Response**
		(%)	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***	**Ave.**	***(%)***
LONGITUDINAL IN YEARS 2 & 3											
					—MiC—						
Kelvyn Park-Downer 1 (10)	4			2.75		0.75		0.25		0.00	
Number		0.00%	75.00%		0.00%		25.00%		0.00%		0.00%
Algebra		25.00%	75.00%		0.00%		0.00%		0.00%		0.00%
Space		50.00%	25.00%		25.00%		0.00%		0.00%		0.00%
Measurement		50.00%	25.00%		25.00%		0.00%		0.00%		0.00%
Chance&Data		100.00%	0.00%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Downer 2 (4)	0			-		-		-		-	
Number		-	-		-		-		-		-
Algebra		-	-		-		-		-		-
Space		-	-		-		-		-		-
Measurement		-	-		-		-		-		-
Chance&Data		-	-		-		-		-		-
Kelvyn Park-Novak 1 (15)	6			2.83		1.00		0.17		0.00	
Number		0.00%	83.33%		16.67%		0.00%		0.00%		0.00%
Algebra		50.00%	50.00%		0.00%		0.00%		0.00%		0.00%
Space		33.33%	16.67%		33.33%		16.67%		0.00%		0.00%
Measurement		50.00%	16.67%		33.33%		0.00%		0.00%		0.00%
Chance&Data		83.33%	16.67%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Novak 2 (17)	7			3.71		1.86		0.86		0.14	
Number		0.00%	42.86%		14.29%		28.57%		14.29%		0.00%
Algebra		14.29%	71.43%		0.00%		14.29%		0.00%		0.00%
Space		14.29%	42.86%		28.57%		14.29%		0.00%		0.00%
Measurement		14.29%	14.29%		57.14%		14.29%		0.00%		0.00%
Chance&Data		85.71%	14.29%		0.00%		0.00%		0.00%		0.00%
Kelvyn Park-Woods 1 (15)	4			4.25		2.25		0.25		0.00	
Number		0.00%	75.00%		0.00%		25.00%		0.00%		0.00%
Algebra		0.00%	100.00%		0.00%		0.00%		0.00%		0.00%
Space		0.00%	0.00%		100.00%		0.00%		0.00%		0.00%
Measurement		0.00%	25.00%		75.00%		0.00%		0.00%		0.00%
Chance&Data		75.00%	0.00%		25.00%		0.00%		0.00%		0.00%

Table F8

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 4

School-Class (*N*)	**Effort** *in mathematics*		**Confidence** *in ability to do mathematics*		**Interest** *in mathematics*		**Usefulness** *of mathematics*		**Ability to communicate** *about mathematics*	
	(*N*)	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**	**(*N*)**	**Mean**
–MiC–										
Kelvyn Park-Downer 1 (16)	15	2.01	15	2.13	15	2.28	15	1.89	15	1.87
Kelvyn Park-Downer 2 (5)	5	2.73	5	2.41	5	2.75	5	2.53	5	2.31
Kelvyn Park-Novak 1 (16)	11	1.91	11	2.01	11	1.71	11	1.77	11	2.01
Kelvyn Park-Novak 2 (22)	17	2.08	17	1.92	17	2.29	17	1.77	17	2.06
Kelvyn Park-Woods 1 (20)	19	2.27	19	1.93	19	2.28	19	1.85	19	2.07

Table F9

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 4

School-Class *(N)*	**Subscale *(1 = very true; 4 = not true at all)***				
	Effort	**Confidence**	**Interest**	**Usefulness**	**Communication**
		–MiC–			
Kelvyn Park-Downer 1 (16)					
Count	15.00	15.00	15.00	15.00	15.00
Mean	2.01	2.13	2.28	1.89	1.87
Median	2.17	2.20	2.13	1.75	1.71
Minimum	1.00	1.20	1.25	1.25	1.29
Maximum	3.33	2.80	3.63	2.75	2.71
Std. Deviation	0.64	0.45	0.74	0.51	0.46
Kelvyn Park-Downer 2 (5)					
Count	5	5	5	5	5
Mean	2.73	2.41	2.75	2.53	2.31
Median	2.67	2.40	3.13	2.38	2.29
Minimum	2.33	2.20	1.38	2.25	1.86
Maximum	3.17	2.67	3.50	2.88	2.86
Std. Deviation	0.35	0.22	0.85	0.27	0.37
Kelvyn Park-Novak 1 (16)					
Count	11	11	11	11	11
Mean	1.91	2.01	1.71	1.77	2.01
Median	2.00	2.00	1.71	1.75	2.00
Minimum	1.33	1.00	1.00	1.00	1.00
Maximum	2.33	2.75	2.38	3.00	3.00
Std. Deviation	0.36	0.53	0.49	0.60	0.62
Kelvyn Park-Novak 2 (22)					
Count	17	17	17	17	17
Mean	2.08	1.92	2.29	1.77	2.06
Median	2.00	1.80	2.25	1.75	1.86
Minimum	1.17	1.00	1.00	1.13	1.29
Maximum	3.00	2.80	4.00	2.75	3.14
Std. Deviation	0.49	0.54	0.78	0.42	0.59
Kelvyn Park-Woods 1(20)					
Count	19	19	19	19	19
Mean	2.27	1.93	2.28	1.85	2.07
Median	2.17	1.80	2.13	1.86	2.14
Minimum	1.50	1.00	1.38	1.13	1.29
Maximum	3.50	3.20	3.75	2.63	3.00
Std. Deviation	0.50	0.59	0.61	0.36	0.46

Table F10

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 4, by Teacher

School-Class *(N)*	Item Number *(see Key)*															
	3		4		6		11		16		20		27		28	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
							—MiC—									
Kelvyn Park-Downer (21)	19	1.58	20	2.00	20	2.45	20	1.35	20	1.50	19	1.58	20	2.65	20	2.65
Kelvyn Park-Novak (38)	28	1.32	28	1.57	28	2.25	27	1.30	28	1.14	28	1.36	28	1.89	28	2.07
Kelvyn Park-Woods (20)	19	1.47	19	1.37	19	2.11	18	1.50	19	1.32	19	2.00	19	2.42	19	2.53

School-Class *(N)*	37		38		39		44		45		49		53		55	
	(N)	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean	*(N)*	Mean
							—MiC—									
Kelvyn Park-Downer (21)	20	2.90	18	1.83	19	1.84	20	3.40	20	2.40	19	2.11	19	1.74	13	2.46
Kelvyn Park-Novak (38)	28	2.11	28	1.57	28	1.89	28	3.32	28	2.54	28	1.75	28	1.50	35	2.86
Kelvyn Park-Woods (20)	18	2.94	18	1.78	18	2.11	18	3.00	18	2.33	17	1.41	18	1.72	1	1.00

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table F11

Class Means on General Perception Items of the Student Attitude Inventory, Grade 8, District 4

School-Class *(N)*	Item Number *(see Key)*																							
	3			4			6			11			16			20			27			28		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
—MiC—																								
Kelvyn Park-Downer 1 (16)	14	1.50	0.76	15	2.00	1.07	15	2.47	1.06	15	1.20	0.56	15	1.47	0.92	14	1.64	1.08	15	2.67	1.05	15	2.60	1.30
Kelvyn Park-Downer 2 (5)	5	1.80	0.84	5	2.00	1.22	5	2.40	1.14	5	1.80	1.30	5	1.60	0.55	5	1.40	0.55	5	2.60	1.14	5	2.80	1.30
Kelvyn Park-Novak 1 (16)	11	1.18	0.60	11	1.64	0.81	11	2.64	1.12	11	1.18	0.40	11	1.18	0.40	11	1.45	0.93	11	2.09	1.04	11	1.91	1.14
Kelvyn Park-Novak 2 (22)	17	1.41	0.51	17	1.53	0.62	17	2.00	0.79	16	1.38	0.62	17	1.12	0.33	17	1.29	0.59	17	1.76	0.75	17	2.18	0.73
Kelvyn Park-Woods 1 (20)	19	1.47	0.61	19	1.37	0.50	19	2.11	0.88	18	1.50	0.71	19	1.32	0.75	19	2.00	1.00	19	2.42	1.26	19	2.53	1.02

School-Class *(N)*	37			38			39			44			45			49			53			55		
	(N)	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD	*(N)*	Mean	StD
—MiC—																								
Kelvyn Park-Downer 1 (16)	15	2.87	1.13	14	1.86	1.03	15	1.80	0.86	15	3.33	0.62	15	2.53	1.06	14	2.14	1.03	14	1.57	0.76	5	2.20	0.84
Kelvyn Park-Downer 2 (5)	5	3.00	0.71	4	1.75	0.96	4	2.00	1.15	5	3.60	0.55	5	2.00	1.00	5	2.00	1.00	5	2.20	1.10	8	2.63	0.92
Kelvyn Park-Novak 1 (16)	11	1.73	1.01	11	1.73	1.10	11	1.91	0.83	11	3.18	0.87	11	2.82	1.08	11	1.82	0.87	11	1.55	0.69	17	2.71	0.69
Kelvyn Park-Novak 2 (22)	17	2.35	0.93	17	1.47	0.87	17	1.88	0.93	17	3.41	0.62	17	2.35	0.93	17	1.71	1.05	17	1.47	0.80	18	3.00	0.77
Kelvyn Park-Woods 1 (20)	18	2.94	1.06	18	1.78	1.17	18	2.11	1.08	18	3.00	0.97	18	2.33	1.03	17	1.41	0.62	18	1.72	0.83	1	1.00	.

Key

3. I feel sure that I am able to learn new ideas in math class. *(confidence in ability to learn mathematics)*
4. In mathematics, you can discover new ways of solving problems that the teacher or your classmates may not have thought of. *(problem solving)*
6.* If I use a calculator to solve a problem, I can be sure it will always give me the right answer. *(calculator use)*
11. Anyone who works hard enough can be good at math. *(effort)*
16. It's okay if I solve a math problem differently than my classmates do. *(problem solving)*
20.* Mathematics is not related to any of my other school subjects. *(connection to other school subjects)*
27.* Understanding why an answer is right is not as important as getting the right answer. *(understanding vs. answer)*
28.* Mathematics is more difficult to understand than other subjects. *(connection to other school subjects)*
37.* No matter how hard a person works, some people are just naturally good at math and some are just not. *(effort)*
38.* Answering questions correctly in math means only giving a number. *(process vs. answer)*
39.* Each new math topic I study is not related to ones I have learned before. *(connection among mathematics topics)*
44.* When my teacher asks a question I will get it right if I have memorized the correct rule or fact. *(mathematics as facts or rules)*
45.* If you have to use a calculator to solve a problem, you don't really understand how to do the problem. *(calculator use)*
49.* It really doesn't matter if you understand a math problem or how you get an answer as long as the answer you get is right. *(understanding vs. answer)*
53. Knowing how to solve a problem is as important as getting the answer. *(process vs. answer)*
55.* Mathematics is mostly learned by memorizing facts and rules. *(mathematics as facts or rules)*

* Reverse-scored due to wording of question.

Table F12

Eighth-Grade Class Means on Student Attribution of Success or Failure in Mathematics in District 4

School-Class (*N*)	Success								Failure							
	Teacher		Ability		Effort		Luck		Teacher		Ability		Effort		Luck	
	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean	(*N*)	Mean
–MiC–																
Kelvyn Park-Downer 1 (16)	15	3.40	15	2.27	15	1.40	15	3.07	15	3.47	15	2.93	15	2.50	15	3.27
Kelvyn Park-Downer 2 (5)	5	3.40	5	1.80	5	1.25	5	3.40	5	2.60	5	2.80	5	1.80	5	3.60
Kelvyn Park-Novak 1 (16)	11	3.64	11	2.00	11	1.27	11	3.55	11	3.45	11	3.36	11	2.00	11	3.73
Kelvyn Park-Novak 2 (22)	17	3.53	17	2.59	17	1.29	17	3.35	17	3.53	17	3.06	17	2.06	17	3.65
Kelvyn Park-Woods 1 (20)	19	3.89	19	2.05	19	1.56	19	3.32	19	3.39	19	2.95	19	1.78	19	3.65

Table F13

Student Preference Ranking of Classes in District 4, Grade 8

Teacher-Class *(N)*	SQ *(N)*	Social Studies	Science	Math	Reading	Writing	Art	Music	PE	Band	Other[1]
					—MiC—						
Kelvyn Park-Downer 1 (16)	14	50	7	0	7	0	0	0	21	0	14
Kelvyn Park-Downer 2 (5)	5	20	0	0	0	20	20	0	40	0	0
Kelvyn Park-Novak 1 (16)	14	14	7	43	0	7	14	0	7	0	0
Kelvyn Park-Novak 2 (22)	15	27	0	20	0	0	20	0	7	0	27
Kelvyn Park-Woods 1 (20)	18	11	17	17	0	0	11	6	11	0	28

[1] Other includes mutiple preferences.

Note: Response rates designate class mean percents.

Table F14

Class Mean Percents on Student Judgment About Frequency of Communication About Mathematics for Eighth-Grade Classes in District 4

School-Class *(N)*	Mathematical Ideas and Problem Strategies					Homework Problems					Ways Mathematics is Used Outside of School				
	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often	(*N*)	Never	Some-times	Often	Very Often
						— MiC —									
Kelvyn Park-Downer 1 (16)	14	21	57	7	14	14	7	50	21	21	14	36	36	21	7
Kelvyn Park-Downer 2 (5)	5	60	20	0	20	5	40	20	20	20	5	60	20	0	20
Kelvyn Park-Novak 1 (16)	14	0	29	43	29	14	0	36	21	43	14	7	21	29	43
Kelvyn Park-Novak 2 (22)	15	40	27	20	13	15	7	67	20	7	15	40	47	0	13
Kelvyn Park-Woods 1 (20)	18	0	56	28	17	18	0	39	50	11	18	22	39	17	22

Note: Response rates designate class mean percents.