

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

*External Assessment Anchor Items, 1997-1998, 1998-1999, 1999-2000*

(Technical Report #44)

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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 5, 6, and 7 in 1997). The variables have been organized in five categories (prior, independent, intervening, outcome, and consequent). (See Figure 1 for variables and hypothesized relationships.)

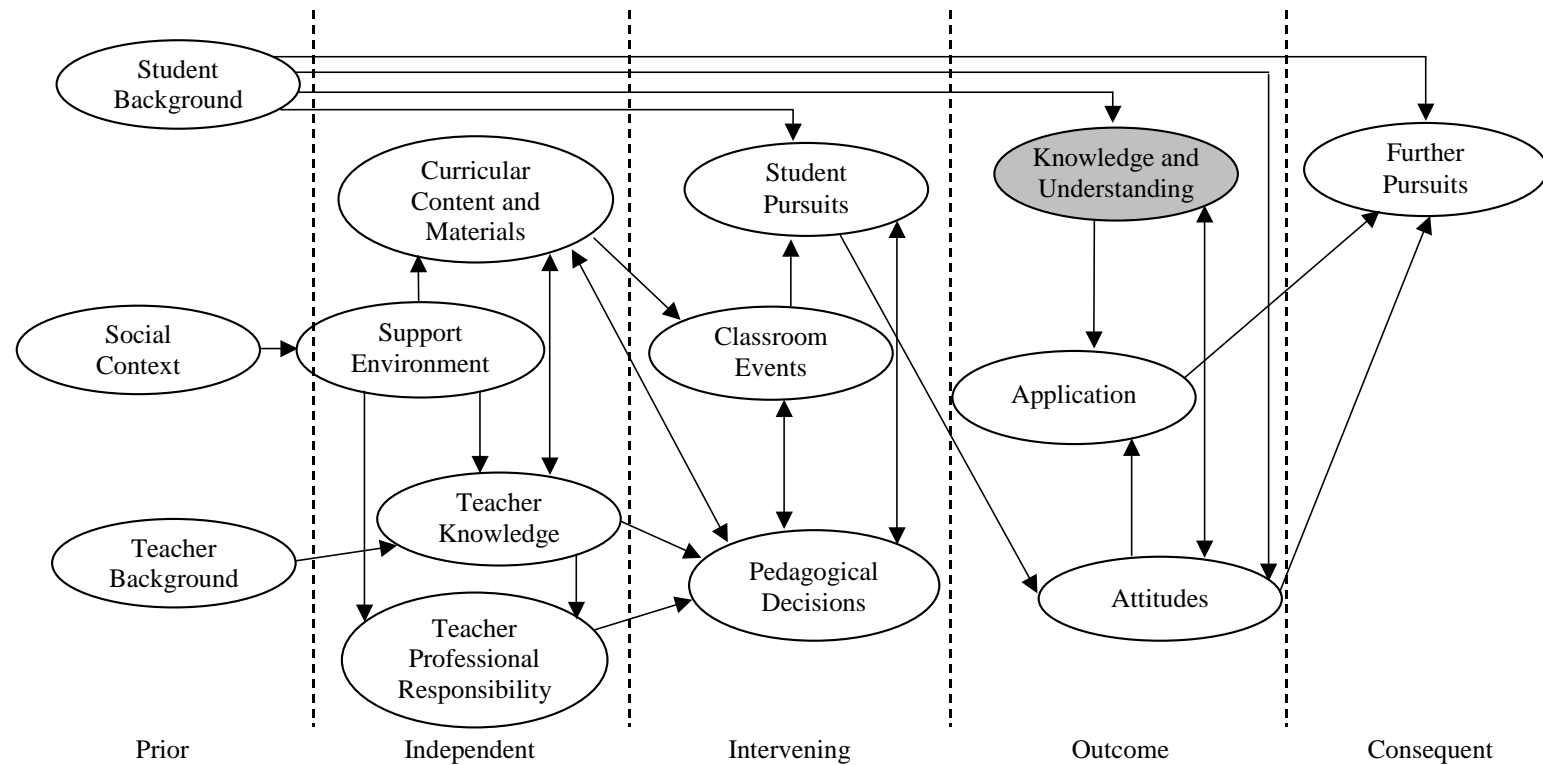


Figure 1. Revised model for the monitoring of school mathematics.

### Overview

The data in this Technical Report contain the general results for the eight grade-level-by-year studies shown as white ellipses in Figure 2. The summary data has been derived from each student's anchor item scores on the External Assessment (EA) (see Appendix A).

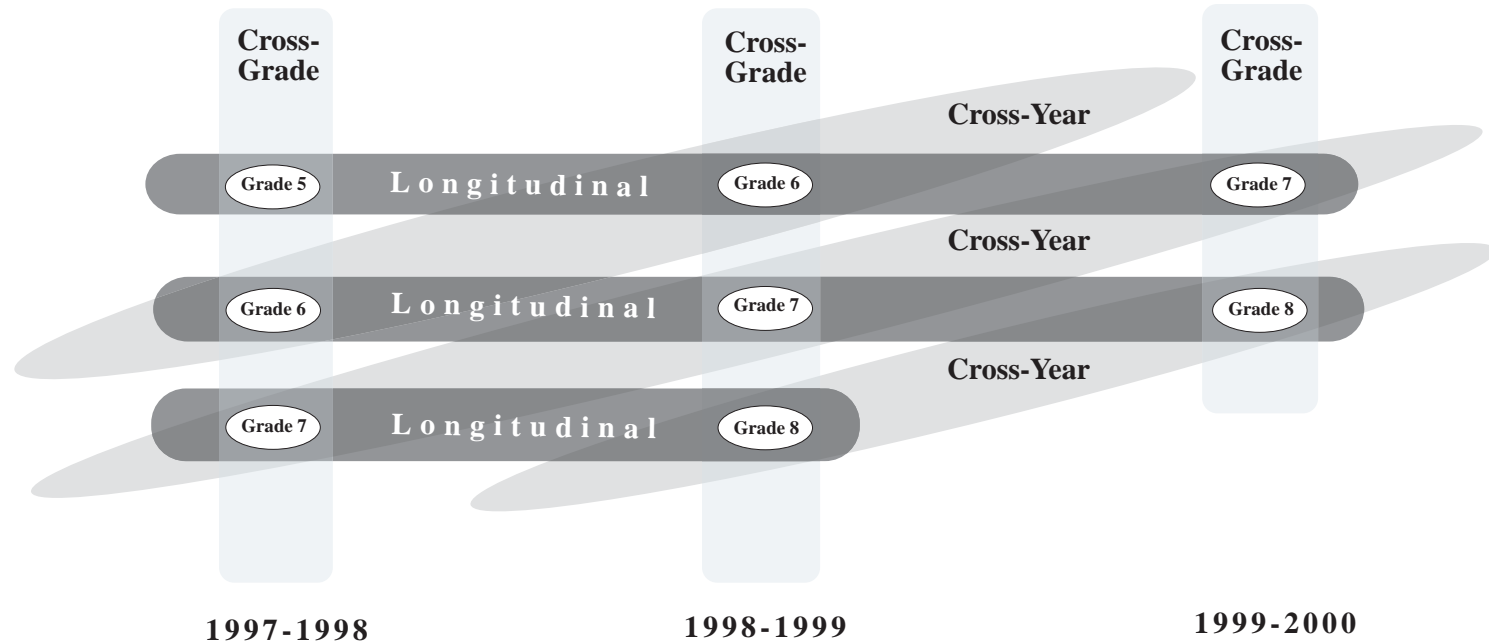


Figure 2. Sources of Data and Planned Comparisons of the MiC Longitudinal/Cross-Sectional Study

**External Assessment Means by Content Area in *Mathematics in Context* Classrooms**

Table 1.1  
*External Assessment Content Strand Means for Students in Mathematics in Context Classrooms, Grade-Level-by-Year Studies in 1997-1998, 1998-1999, and 1999-2000*

Year	Grade	(N)	Content Area Mean				
			Number	Algebra	Geometry	Statistics	Total
Year 1							
	Grade 5	453	34.83%	25.65%	21.63%	32.53%	28.66%
	Grade 6	547	34.13%	22.52%	20.64%	32.99%	27.57%
	Grade 7	511	40.27%	29.82%	31.10%	42.15%	35.84%
Year 2							
	Grade 6	566	37.07%	26.08%	23.07%	36.94%	30.79%
	Grade 7	652	42.56%	27.73%	23.79%	41.75%	33.96%
	Grade 8	322	42.27%	31.93%	33.63%	40.20%	37.01%
Year 3							
	Grade 7	273	52.38%	38.68%	36.78%	54.70%	45.64%
	Grade 8	259	47.41%	34.67%	29.96%	42.75%	38.70%

Table 1.2  
*External Assessment Content Strand Means for Students in Mathematics in Context  
 Classrooms, Grade Five, Six, and Seven Students in 1997-1998, by District*

Grade/District	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
District 1	156	38.72%	25.51%	24.94%	35.07%	31.06%
District 2	168	30.71%	26.55%	17.74%	25.83%	25.21%
District 3	129	35.50%	24.65%	22.71%	38.18%	30.26%
Grade 6						
District 1	157	31.97%	18.85%	16.05%	27.50%	23.59%
District 2	161	29.88%	25.34%	19.32%	27.87%	25.60%
District 3	152	42.37%	26.45%	28.49%	48.05%	36.34%
District 4	77	31.17%	16.36%	17.27%	25.16%	22.49%
Grade 7						
District 1	91	34.51%	35.60%	24.51%	38.93%	33.39%
District 2	185	36.05%	28.00%	29.08%	33.75%	31.72%
District 3	127	51.34%	39.53%	36.46%	57.83%	46.29%
District 4	108	39.35%	16.67%	33.80%	40.83%	32.66%

Table 1.3  
*External Assessment Content Strand Means for Students in Mathematics in Context  
 Classrooms, Grade Six, Seven, and Eight Students in 1998-1999, by District*

Grade/District	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 6						
District 1	172	42.44%	27.91%	23.66%	45.02%	34.76%
District 2	174	28.85%	21.38%	15.29%	26.70%	23.06%
District 3	117	44.62%	33.50%	34.62%	49.73%	40.62%
District 4	103	33.40%	22.52%	22.14%	26.18%	26.06%
Grade 7						
District 1	131	44.27%	30.69%	23.89%	43.49%	35.59%
District 2	212	35.33%	26.51%	18.87%	33.53%	28.56%
District 3	127	48.66%	34.17%	34.41%	58.24%	43.87%
District 4	182	45.49%	22.53%	22.03%	38.55%	32.15%
Grade 8						
District 1	86	39.77%	28.14%	31.40%	33.69%	33.25%
District 2	92	42.83%	34.13%	32.28%	40.60%	37.46%
District 3	64	57.97%	48.44%	45.00%	58.74%	52.54%
District 4	80	31.75%	20.25%	28.50%	31.91%	28.10%

Table 1.4  
*External Assessment Content Strand Means for Students in Mathematics in Context  
 Classrooms, Grade Seven and Eight Students in 1999-2000, by District*

Grade/District	(N)	Content Area Mean				
		Number	Algebra	Geometry	Statistics	Total
Grade 7						
District 1	83	50.00%	39.52%	34.22%	55.35%	44.77%
District 2	61	45.90%	34.75%	34.26%	46.16%	40.27%
District 3	96	61.04%	47.71%	45.83%	64.23%	54.70%
District 4	33	45.15%	17.58%	21.52%	41.16%	31.35%
Grade 8						
District 1	109	46.97%	35.05%	30.18%	46.65%	39.71%
District 2	87	44.60%	31.95%	29.08%	37.34%	35.74%
District 3	4	42.50%	15.00%	10.00%	16.60%	21.03%
District 4	59	52.71%	39.32%	32.20%	45.27%	42.38%

Table 1.5  
*External Assessment Content Strand for 1997-1998 Students in Mathematics in Context Classrooms, Grade Five, Six, and Seven Students in District 1, by Teacher*

Grade/ Teacher ID	Teacher (N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
4	18	36.67%	11.11%	12.78%	28.44%	22.25%
14	53	27.17%	20.38%	22.45%	26.00%	24.00%
19	26	46.92%	32.31%	22.69%	30.97%	33.22%
27	19	37.89%	31.58%	31.58%	20.65%	30.43%
31	31	56.77%	29.68%	40.00%	68.52%	48.74%
49	9	26.67%	37.78%	4.44%	28.84%	24.43%
Grade 6						
30	38	31.84%	27.37%	18.16%	28.91%	26.57%
33	60	32.33%	18.33%	20.17%	29.42%	25.06%
38	59	31.69%	13.90%	10.51%	24.63%	20.18%
Grade 7						
8	40	34.50%	34.50%	23.25%	39.45%	32.92%
44	51	34.51%	36.47%	25.49%	38.52%	33.75%



Table 1.6  
*External Assessment Content Strand for 1997-1998 Students in Mathematics in Context Classrooms, Grade Five, Six, and Seven Students in District 2, by Teacher*

Grade/ Teacher ID	Teacher (N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
2	32	28.13%	25.63%	15.94%	27.88%	24.39%
12	41	26.83%	25.37%	16.59%	20.29%	22.27%
22	23	33.48%	20.87%	17.39%	21.69%	23.36%
26	72	33.19%	29.44%	19.31%	29.40%	27.84%
Grade 6						
37	45	24.44%	21.78%	15.78%	22.94%	21.23%
45	36	42.78%	27.22%	26.67%	39.39%	34.01%
51	47	29.36%	25.96%	17.45%	25.77%	24.64%
52	33	23.94%	27.27%	18.79%	25.01%	23.75%
Grade 7						
11	41	30.49%	25.85%	30.73%	29.24%	29.08%
20	46	31.52%	34.78%	21.74%	39.79%	31.96%
35	50	40.40%	26.00%	35.20%	32.88%	33.62%
47	48	40.63%	25.42%	28.33%	32.74%	31.78%

Table 1.7  
*External Assessment Content Strand for 1997-1998 Students in Mathematics in Context Classrooms, Grade Five, Six, and Seven Students in District 3, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
3	18	32.78%	24.44%	14.44%	27.36%	24.76%
7	23	45.65%	26.96%	29.13%	45.14%	36.72%
23	22	26.82%	23.64%	20.91%	28.44%	24.95%
25	21	38.57%	21.90%	18.10%	44.38%	30.74%
41	22	33.18%	21.82%	20.00%	44.17%	29.79%
48	23	35.22%	28.70%	31.30%	37.63%	33.21%
Grade 6						
6	24	47.50%	36.67%	35.00%	62.15%	45.33%
15	42	44.05%	26.19%	26.19%	44.08%	35.13%
39	41	43.41%	26.83%	27.07%	53.28%	37.65%
40	38	41.58%	21.58%	32.63%	42.55%	34.59%
50	7	12.86%	17.14%	5.71%	22.83%	14.64%
Grade 7						
16	127	51.34%	39.53%	36.46%	57.83%	46.29%

Table 1.8  
*External Assessment Content Strand for 1997-1998 Students in Mathematics in Context  
 Classrooms, Grade Five, Six, and Seven Students in District 4, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5		(none)				
Grade 6						
29	47	24.47%	13.19%	17.45%	19.98%	18.77%
46	30	41.67%	21.33%	17.00%	33.29%	28.32%
Grade 7						
28	35	25.71%	13.14%	30.86%	30.09%	24.95%
34	29	44.83%	22.07%	35.86%	42.71%	36.37%
36	44	46.59%	15.91%	34.77%	48.14%	36.35%

Table 1.9  
*External Assessment Content Strand for 1998-1999 Students in Mathematics in Context Classrooms, Grade Six, Seven, and Eight Students in District 1, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 6						
33	48	34.38%	25.00%	22.50%	42.45%	31.08%
38	45	54.00%	33.33%	32.00%	59.20%	44.63%
67	24	42.50%	28.33%	22.08%	34.11%	31.76%
73	33	28.79%	21.21%	12.42%	30.68%	23.28%
78	22	56.82%	32.73%	27.73%	55.06%	43.08%
Grade 7						
8	30	47.00%	28.67%	23.00%	43.73%	35.60%
64	2	70.00%	50.00%	40.00%	69.90%	57.48%
74	52	43.65%	31.54%	21.92%	46.72%	35.96%
88	47	42.13%	30.21%	25.96%	38.65%	34.24%
Grade 8						
75	33	39.09%	25.45%	34.24%	36.74%	33.88%
87	53	40.19%	29.81%	29.62%	31.78%	32.85%

Table 1.10  
*External Assessment Content Strand for 1998-1999 Students in Mathematics in Context Classrooms, Grade Six, Seven, and Eight Students in District 2, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 6						
52	41	20.24%	18.54%	14.15%	21.92%	18.71%
69	42	50.95%	34.29%	26.67%	47.85%	39.94%
83	41	22.68%	13.66%	5.85%	20.96%	15.79%
85	50	22.40%	19.20%	14.40%	17.58%	18.39%
Grade 7						
45	32	52.50%	31.25%	29.38%	42.84%	38.99%
62	59	32.37%	29.49%	18.31%	33.27%	28.36%
70	72	31.53%	23.89%	16.67%	30.14%	25.56%
80	49	33.27%	23.67%	15.92%	32.75%	26.40%
Grade 8						
20	40	49.75%	42.50%	38.50%	51.92%	45.67%
47	52	37.50%	27.69%	27.50%	31.89%	31.15%

Table 1.11  
*External Assessment Content Strand for 1998-1999 Students in Mathematics in Context  
 Classrooms, Grade Six, Seven, and Eight Students in District 3, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 6						
6	39	45.90%	35.38%	38.46%	56.16%	43.98%
15	41	41.46%	39.51%	31.71%	45.47%	39.54%
40	34	49.71%	25.29%	35.00%	51.11%	40.28%
50	3	13.33%	20.00%	20.00%	8.87%	15.55%
Grade 7						
9	7	20.00%	11.43%	14.29%	22.83%	17.14%
16	120	50.33%	35.50%	35.58%	60.31%	45.43%
Grade 8						
71	64	57.97%	48.44%	45.00%	58.74%	52.54%

Table 1.12  
*External Assessment Content Strand for 1998-1999 Students in Mathematics in Context  
 Classrooms, Grade Six, Seven, and Eight Students in District 4, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 6						
29	33	34.55%	24.85%	21.82%	22.39%	25.90%
46	31	40.32%	27.10%	29.68%	31.76%	32.21%
65	39	26.92%	16.92%	16.41%	24.94%	21.30%
Grade 7						
28	54	38.52%	21.48%	16.48%	30.46%	26.74%
36	62	48.06%	25.81%	24.68%	44.88%	35.86%
81	66	48.79%	20.30%	24.09%	39.23%	33.10%
Grade 8						
66	1	60.00%	40.00%	40.00%	0.00%	35.00%
68	41	35.37%	22.44%	28.78%	37.55%	31.03%
89	38	27.11%	17.37%	27.89%	26.66%	24.76%

Table 1.13  
*External Assessment Content Strand for 1999-2000 Students in Mathematics in Context Classrooms, Grade Seven and Eight Students in District 1, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 7						
13	8	36.25%	22.50%	22.50%	41.58%	30.71%
74	46	52.17%	40.87%	36.30%	54.85%	46.05%
90	29	50.34%	42.07%	34.14%	59.94%	46.62%
Grade 8						
75	35	48.00%	33.14%	27.71%	51.17%	40.01%
91	23	41.30%	33.91%	23.91%	38.77%	34.48%
98	51	48.82%	36.86%	34.71%	47.11%	41.88%

Table 1.14  
*External Assessment Content Strand for 1999-2000 Students in Mathematics in Context Classrooms, Grade Seven and Eight Students in District 2, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 7						
52	16	41.25%	26.25%	23.13%	27.88%	29.63%
69	29	55.52%	41.38%	45.52%	60.59%	50.75%
94	16	33.13%	31.25%	25.00%	38.28%	31.91%
Grade 8						
45	14	55.00%	45.71%	40.00%	67.50%	52.05%
62	12	67.50%	50.00%	54.17%	54.92%	56.65%
70	48	34.38%	23.75%	20.00%	26.09%	26.05%
95	13	50.00%	30.77%	27.69%	30.17%	34.66%



Table 1.15  
*External Assessment Content Strand for 1999-2000 Students in Mathematics in Context Classrooms, Grade Seven and Eight Students in District 3, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 7						
9	2	45.00%	20.00%	10.00%	43.30%	29.58%
16	94	61.38%	48.30%	46.60%	64.67%	55.24%
Grade 8						
9	4	42.50%	15.00%	10.00%	16.60%	21.03%
71	0					

Table 1.16  
*External Assessment Content Strand for 1999-2000 Students in Mathematics in Context Classrooms, Grade Seven and Eight Students in District 4, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 7						
28	13	45.38%	10.77%	13.08%	39.46%	27.17%
81	9	45.56%	24.44%	28.89%	46.60%	36.37%
93	11	44.55%	20.00%	25.45%	38.71%	32.18%
Grade 8						
29	11	30.91%	30.91%	20.91%	38.15%	30.22%
66	33	61.52%	44.85%	35.45%	45.81%	46.91%
89	15	49.33%	33.33%	33.33%	49.31%	41.33%

### Conventional Classrooms

Table 2.17  
*External Assessment Content Strand Means for Students in Conventional Classrooms, Grade-Level-by-Year Studies in 1997-1998, 1998-1999, and 1999-2000*

Year	Grade	(N)	Content Area Mean				
			Number	Algebra	Geometry	Statistics	Total
Year 1							
	Grade 5	103	37.09%	25.44%	23.88%	42.98%	32.35%
	Grade 6	125	30.24%	37.76%	20.00%	27.38%	28.85%
	Grade 7	111	33.51%	27.75%	26.76%	39.64%	31.92%
Year 2							
	Grade 6	72	38.75%	35.56%	21.53%	43.56%	34.85%
	Grade 7	104	35.96%	26.92%	21.44%	38.28%	30.65%
	Grade 8	95	34.21%	29.68%	32.95%	34.01%	32.71%
Year 3							
	Grade 7	29	41.38%	32.41%	28.62%	44.05%	36.62%
	Grade 8	33	45.45%	26.67%	33.03%	44.41%	37.39%

Table 2.18  
*External Assessment Content Strand Means for Students in Conventional Classrooms,  
 Grade Five, Six, and Seven Students in 1997-1998, by District*

Grade/District	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
District 1	52	41.35%	25.00%	23.08%	47.62%	34.26%
District 2	51	32.75%	25.88%	24.71%	38.25%	30.40%
Grade 6						
District 1	76	35.00%	49.47%	24.74%	28.99%	34.55%
District 2	49	22.86%	19.59%	12.65%	24.89%	20.00%
Grade 7						
District 1	84	36.79%	30.48%	25.36%	44.54%	34.29%
District 2	27	23.33%	19.26%	31.11%	24.42%	24.53%

Table 2.19  
*External Assessment Content Strand Means for Students in Conventional Classrooms,  
 Grade Six, Seven, and Eight Students in 1998-1999, by District*

Grade/District	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 6						
District 1	22	21.36%	25.45%	12.27%	24.21%	20.83%
District 2	50	46.40%	40.00%	25.60%	52.07%	41.02%
Grade 7						
District 1	88	39.77%	30.23%	24.20%	41.84%	34.01%
District 2	16	15.00%	8.75%	6.25%	18.75%	12.19%
Grade 8						
District 1	65	39.54%	32.00%	36.15%	41.40%	37.27%
District 2	30	22.67%	24.67%	26.00%	18.00%	22.83%

Table 2.20  
*External Assessment Content Strand Means for Students in Conventional Classrooms,  
 Grade Seven and Eight Students in 1999-2000, by District*

Grade/District	(N)	Content Area Mean				
		Number	Algebra	Geometry	Statistics	Total
Grade 7						
District 1	12	33.33%	21.67%	26.67%	32.12%	28.45%
District 2	17	47.06%	40.00%	30.00%	52.47%	42.38%
Grade 8						
District 1	33	45.45%	26.67%	33.03%	44.41%	37.39%
District 2	(none)					

Table 2.21  
*External Assessment Content Strand for 1997-1998 Students in Conventional Classrooms,  
 Grade Five, Six, and Seven Students in District 1, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
17	22	40.91%	25.45%	19.55%	48.11%	33.50%
42	30	41.67%	24.67%	25.67%	47.27%	34.82%
Grade 6						
18	17	30.00%	12.94%	14.12%	17.24%	18.57%
32	59	36.44%	60.00%	27.80%	32.38%	39.15%
Grade 7						
13	39	44.10%	36.41%	29.74%	54.96%	41.30%
53	45	30.44%	25.33%	21.56%	35.50%	28.21%

Table 2.22  
*External Assessment Content Strand for 1997-1998 Students in Conventional Classrooms,  
 Grade Five, Six, and Seven Students in District 2, by Teacher*

Grade/ Teacher ID	(N)	Content Strand Mean				
		Number	Algebra	Geomery	Statistics	Total
Grade 5						
43	51	32.75%	25.88%	24.71%	38.25%	30.40%
Grade 6						
10	28	16.07%	20.00%	12.14%	21.42%	17.41%
21	21	31.90%	19.05%	13.33%	29.51%	23.45%
Grade 7						
5	24	20.00%	19.17%	30.83%	23.31%	23.33%
24	3	50.00%	20.00%	33.33%	33.33%	34.17%

Table 2.23  
*External Assessment Content Strand for 1998-1999 Students in Conventional Classrooms,  
 Grade Six, Seven, and Eight Students in District 1, by Teacher*

Grade/ Teacher ID (N)	Content Strand Mean				
	Number	Algebra	Geomery	Statistics	Total
Grade 6					
79 22	21.36%	25.45%	12.27%	24.21%	20.83%
Grade 7					
13 48	42.29%	28.75%	24.58%	45.49%	35.28%
76 22	31.82%	28.18%	20.00%	37.83%	29.46%
77 18	42.78%	36.67%	28.33%	36.99%	36.19%
Grade 8					
60 22	25.00%	25.45%	25.45%	20.90%	24.20%
86 43	46.98%	35.35%	41.63%	51.89%	43.96%

Table 2.24  
*External Assessment Content Strand for 1998-1999 Students in Conventional Classrooms,  
 Grade Six, Seven, and Eight Students in District 2, by Teacher*

Grade/ Teacher ID (N)	Content Strand Mean				
	Number	Algebra	Geomery	Statistics	Total
Grade 6					
21 20	55.00%	31.00%	26.50%	37.26%	37.44%
82 30	40.67%	46.00%	25.00%	61.94%	43.40%
Grade 7					
5 16	15.00%	8.75%	6.25%	18.75%	12.19%
Grade 8					
5 25	22.40%	24.00%	27.20%	18.40%	23.00%
24 5	24.00%	28.00%	20.00%	16.00%	22.00%

Table 2.25  
*External Assessment Content Strand for 1999-2000 Students in Conventional Classrooms,  
 Grade Seven and Eight Students in District 1, by Teacher*

Grade/ Teacher ID (N)	Content Strand Mean				
	Number	Algebra	Geomery	Statistics	Total
Grade 7 77 12	33.33%	21.67%	26.67%	32.12%	28.45%
Grade 8 86 29	42.76%	26.21%	31.72%	45.02%	36.43%
92 4	65.00%	30.00%	42.50%	39.95%	44.36%

Table 2.26  
*External Assessment Content Strand for 1999-2000 Students in Conventional Classrooms,  
 Grade Seven and Eight Students in District 2, by Teacher*

Grade/ Teacher ID (N)	Content Strand Mean				
	Number	Algebra	Geomery	Statistics	Total
Grade 7 82 17	47.06%	40.00%	30.00%	52.47%	42.38%
Grade 8 (none)					

### External Assessment Means of Individual Anchor Items for *Mathematics in Context* Classrooms

Table 3.1  
Means and *p*-values for External Assessment Anchor Items in Grade 5 *Mathematics in Context* Classrooms in 1997-1998

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 5, 1997-1998		
			(N)	p-value	Mean
<b>Number</b>	Jill's Trip	58.7	453	57.8	0.58
	Tourists on Bus	58.0	453	40.4	0.40
	Tip Calculation	11.2	453	21.4	0.21
	Radio Sales	30.6	453	39.7	0.40
	Town Populations	37.7	453	0.2*	0.15
<b>Algebra</b>	$3(x+5)=30$	72.0	453	31.8	0.32
	4m	58.0	453	27.8	0.28
	Points on Line	41.0	453	26.0	0.26
	Dropped Ball	34.0	453	29.6	0.30
	Similar Triangles (b)	26.0	453	13.0	0.13
<b>Geometry</b>	Jose's Tree	60.0	453	35.1	0.35
	Perimeter Shapes	32.3	453	28.9	0.29
	Draw Rectangle	31.0	453	14.1*	0.18
	Rectangle Radio (area)	10.0	453	0.7*	0.02
	Square/Circle Areas	29.2	453	24.3	0.24
<b>Statistics</b>	Blue Pen	53.0	453	37.0	0.37
	Red/Blue Cube	47.0	453	31.3	0.31
	Car Speed/ Stopping Dist.	49.0	453	38.9	0.39
	Batteries	35.7	453	26.0	0.26
	Metro Rail	25.5	453	0.3*	0.29

\* In scoring these items, partial credit was given for partially correct answers. The *p*-value represents percent of completely correct answers, the mean factors in the partially correct answers.



Table 3.2  
Means and *p*-values for External Assessment Anchor Items in Grade 6 *Mathematics in Context* Classrooms in 1997-1998

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 6, 1997-1998		
			(N)	p-value	Mean
<b>Number</b>	Jill's Trip	58.7	547	54.3	0.54
	Tourists on Bus	58.0	547	43.3	0.43
	Tip Calculation	11.2	547	30.3	0.30
	Radio Sales	30.6	547	34.4	0.34
	Town Populations	37.7	547	0.0*	0.08
<b>Algebra</b>	$3(x+5)=30$	72.0	547	33.6	0.34
	4m	58.0	547	15.9	0.16
	Points on Line	41.0	547	23.2	0.23
	Dropped Ball	34.0	547	30.2	0.30
	Similar Triangles (b)	26.0	547	1.0	0.10
<b>Geometry</b>	Jose's Tree	60.0	547	40.6	0.41
	Perimeter Shapes	32.3	547	23.4	0.23
	Draw Rectangle	31.0	547	3.1*	0.06
	Rectangle Radio (area)	10.0	547	0.7*	0.02
	Square/Circle Areas	29.2	547	30.7	0.31
<b>Statistics</b>	Blue Pen	53.0	547	43.7	0.44
	Red/Blue Cube	47.0	547	32.0	0.32
	Car Speed/ Stopping Dist.	49.0	547	40.4	0.40
	Batteries	35.7	547	26.5	0.27
	Metro Rail	25.5	547	3.3*	0.22

\* In scoring these items, partial credit was given for partially correct answers. The p-value represents percent of completely correct answers, the mean factors in the partially correct answers.

Table 3.3  
Means and *p*-values for External Assessment Anchor Items in Grade 7 *Mathematics in Context* Classrooms in 1997-1998

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 7, 1997-1998		
			(N)	p-value	Mean
<b>Number</b>	Jill's Trip	58.7	511	69.3	0.69
	Tourists on Bus	58.0	511	48.5	0.49
	Tip Calculation	11.2	511	38.9	0.39
	Radio Sales	30.6	511	36.4	0.36
	Town Populations	37.7	511	0.4*	0.08
<b>Algebra</b>	$3(x+5)=30$	72.0	511	49.7	0.50
	4m	58.0	511	26.8	0.27
	Points on Line	41.0	511	23.1	0.23
	Dropped Ball	34.0	511	35.6	0.36
	Similar Triangles (b)	26.0	511	13.9	0.14
<b>Geometry</b>	Jose's Tree	60.0	511	42.9	0.43
	Perimeter Shapes	32.3	511	31.9	0.32
	Draw Rectangle	31.0	511	44.2*	0.46
	Rectangle Radio (area)	10.0	511	3.7*	0.06
	Square/Circle Areas	29.2	511	29.0	0.29
<b>Statistics</b>	Blue Pen	53.0	511	43.8	0.44
	Red/Blue Cube	47.0	511	41.1	0.41
	Car Speed/ Stopping Dist.	49.0	511	56.9	0.57
	Batteries	35.7	511	35.8	0.36
	Metro Rail	25.5	511	8.2*	0.33

\* In scoring these items, partial credit was given for partially correct answers. The p-value represents percent of completely correct answers, the mean factors in the partially correct answers.

Table 3.4  
Means and  $p$ -values for External Assessment Anchor Items in Grade 6 *Mathematics in Context* Classrooms in 1998-1999

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 6, 1998-1999		
			(N)	p-value	Mean
<b>Number</b>	Jill's Trip	58.7	566	57.2	0.57
	Tourists on Bus	58.0	566	47.3	0.47
	Tip Calculation	11.2	566	33.6	0.34
	Radio Sales	30.6	566	35.3	0.35
	Town Populations	37.7	566	0.0*	0.12
<b>Algebra</b>	$3(x+5)=30$	72.0	566	42.8	0.43
	4m	58.0	566	25.4	0.25
	Points on Line	41.0	566	23.1	0.23
	Dropped Ball	34.0	566	26.9	0.27
	Similar Triangles (b)	26.0	566	12.2	0.12
<b>Geometry</b>	Jose's Tree	60.0	566	43.5	0.43
	Perimeter Shapes	32.3	566	29.5	0.30
	Draw Rectangle	31.0	566	3.7*	0.08
	Rectangle Radio (area)	10.0	566	3.2*	0.06
	Square/Circle Areas	29.2	566	29.2	0.29
<b>Statistics</b>	Blue Pen	53.0	566	44.0	0.44
	Red/Blue Cube	47.0	566	39.0	0.39
	Car Speed/ Stopping Dist.	49.0	566	45.6	0.46
	Batteries	35.7	566	28.8	0.29
	Metro Rail	25.5	566	2.8*	0.27

\* In scoring these items, partial credit was given for partially correct answers. The  $p$ -value represents percent of completely correct answers, the mean factors in the partially correct answers.

Table 3.5  
Means and  $p$ -values for External Assessment Anchor Items in Grade 7 *Mathematics in Context* Classrooms in 1998-1999

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 7, 1998-1999		
			(N)	p-value	Mean
Number	Jill's Trip	58.7	652	68.6	0.69
	Tourists on Bus	58.0	652	48.3	0.48
	Tip Calculation	11.2	652	48.8	0.49
	Radio Sales	30.6	652	37.9	0.38
	Town Populations	37.7	652	0.0*	0.09
Algebra	$3(x+5)=30$	72.0	652	53.8	0.54
	$4m$	58.0	652	22.4	0.22
	Points on Line	41.0	652	26.7	0.27
	Dropped Ball	34.0	652	25.3	0.25
	Similar Triangles (b)	26.0	652	11.0	0.11
Geometry	Jose's Tree	60.0	652	48.3	0.48
	Perimeter Shapes	32.3	652	33.3	0.33
	Draw Rectangle	31.0	652	4.4*	0.06
	Rectangle Radio (area)	10.0	652	2.9*	0.06
	Square/Circle Areas	29.2	652	25.8	0.26
Statistics	Blue Pen	53.0	652	43.1	0.43
	Red/Blue Cube	47.0	652	40.0	0.40
	Car Speed/ Stopping Dist.	49.0	652	58.0	0.58
	Batteries	35.7	652	32.1	0.32
	Metro Rail	25.5	652	5.4	0.36

\* In scoring these items, partial credit was given for partially correct answers. The  $p$ -value represents percent of completely correct answers, the mean factors in the partially correct answers.

Table 3.6  
Means and *p*-values for External Assessment Anchor Items in Grade 8 *Mathematics in Context* Classrooms in 1998-1999

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 8, 1998-1999		
			(N)	p-value	Mean
Number	Jill's Trip	58.7	322	67.7	0.68
	Tourists on Bus	58.0	322	51.2	0.51
	Tip Calculation	11.2	322	39.1	0.39
	Radio Sales	30.6	322	40.1	0.40
	Town Populations	37.7	322	0.0*	0.14
Algebra	$3(x+5)=30$	72.0	322	53.1	0.53
	4m	58.0	322	30.1	0.30
	Points on Line	41.0	322	33.5	0.34
	Dropped Ball	34.0	322	25.2	0.25
	Similar Triangles (b)	26.0	322	17.4	0.17
Geometry	Jose's Tree	60.0	322	52.5	0.52
	Perimeter Shapes	32.3	322	35.4	0.35
	Draw Rectangle	31.0	322	46.6*	0.50
	Rectangle Radio (area)	10.0	322	2.2*	0.05
	Square/Circle Areas	29.2	322	24.8	0.25
Statistics	Blue Pen	53.0	322	41.0	0.41
	Red/Blue Cube	47.0	322	39.1	0.39
	Car Speed/ Stopping Dist.	49.0	322	55.9	0.56
	Batteries	35.7	322	40.4	0.40
	Metro Rail	25.5	322	2.8*	0.25

\* In scoring these items, partial credit was given for partially correct answers. The p-value represents percent of completely correct answers, the mean factors in the partially correct answers.

Table 3.7  
Means and *p*-values for External Assessment Anchor Items in Grade 7 *Mathematics in Context* Classrooms in 1999-2000

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 7, 1999-2000		
			(N)	p-value	Mean
Number	Jill's Trip	58.7	273	72.5	0.73
	Tourists on Bus	58.0	273	66.3	0.66
	Tip Calculation	11.2	273	56.8	0.57
	Radio Sales	30.6	273	46.5	0.47
	Town Populations	37.7	273	2.6*	0.20
Algebra	$3(x+5)=30$	72.0	273	62.3	0.62
	4m	58.0	273	40.3	0.40
	Points on Line	41.0	273	38.5	0.38
	Dropped Ball	34.0	273	28.6	0.29
	Similar Triangles (b)	26.0	273	23.8	0.24
Geometry	Jose's Tree	60.0	273	61.5	0.62
	Perimeter Shapes	32.3	273	47.6	0.48
	Draw Rectangle	31.0	273	15.8*	0.22
	Rectangle Radio (area)	10.0	273	9.9*	0.16
	Square/Circle Areas	29.2	273	36.6	0.37
Statistics	Blue Pen	53.0	273	54.2	0.54
	Red/Blue Cube	47.0	273	53.5	0.53
	Car Speed/ Stopping Dist.	49.0	273	65.9	0.66
	Batteries	35.7	273	46.9	0.47
	Metro Rail	25.5	273	17.9*	0.53

\* In scoring these items, partial credit was given for partially correct answers. The p-value represents percent of completely correct answers, the mean factors in the partially correct answers.

Table 3.8  
Means and  $p$ -values for External Assessment Anchor Items in Grade 8 *Mathematics in Context* Classrooms in 1999-2000

Content Strand	Item Name	International/ National Grade 8 p-value	Grade 7, 1999-2000		
			(N)	p-value	Mean
Number	Jill's Trip	58.7	259	75.3	0.75
	Tourists on Bus	58.0	259	57.1	0.57
	Tip Calculation	11.2	259	48.6	0.49
	Radio Sales	30.6	259	41.7	0.42
	Town Populations	37.7	259	0.0*	0.14
Algebra	$3(x+5)=30$	72.0	259	62.2	0.62
	4m	58.0	259	31.7	0.32
	Points on Line	41.0	259	35.5	0.36
	Dropped Ball	34.0	259	23.2	0.23
	Similar Triangles (b)	26.0	259	20.8	0.21
Geometry	Jose's Tree	60.0	259	59.5	0.59
	Perimeter Shapes	32.3	259	36.7	0.37
	Draw Rectangle	31.0	259	12.4*	0.16
	Rectangle Radio (area)	10.0	259	1.9*	0.05
	Square/Circle Areas	29.2	259	33.2	0.33
Statistics	Blue Pen	53.0	259	47.1	0.47
	Red/Blue Cube	47.0	259	35.5	0.36
	Car Speed/ Stopping Dist.	49.0	259	61.4	0.61
	Batteries	35.7	259	34.4	0.34
	Metro Rail	25.5	259	5.8*	0.35

\* In scoring these items, partial credit was given for partially correct answers. The  $p$ -value represents percent of completely correct answers, the mean factors in the partially correct answers.