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Analysis of 2000 MAP Results from the Jennings School District

This policy brief examines the qualitative and quantitative impacts associated with the installation of computer classrooms in the Jennings School District. Teachers in these classrooms receive extensive professional development training and work with students in a fully networked instructional environment. The results described in this brief suggest that students in these classes have changed their attitudes about school and out-perform other students in standardized tests. In sum, it appears that the program of professional development teamed with the networked instructional environment has a positive impact on students.

Multiple School Improvements in the Jennings School District

Under the leadership of Superintendent Dr. Terry Stewart the Jennings School District has participated in a wide-ranging school improvement program. This program has been multi-faceted, simultaneously focusing on several intensive professional development efforts, on developing school management and staff teams, on developing the technological infrastructure of classrooms, and on improving the appearance of individual school buildings.

Compared to other school districts in St. Louis County, the student population of Jennings has a high proportion of students in poverty and a high proportion of minority students. In the 1999-2000 school year between 9.9 and 84.0 percent of all students in St. Louis County districts qualified for the federal free and reduced lunch program. In Jennings, 76.0 percent of students qualified for this program. At the same time, between 15.2 and 100.0 percent of students in St. Louis County school districts were classified as “minority”. In Jennings 93.6 percent of students were classified as minority.

The results from the 2000 MAP test indicate that Jennings’ program of school improvement has had a positive impact on student performance. For example, between the 1999 and 2000 MAP tests, the percentage of third graders scoring in the top two categories of MAP Science test increased 186%. Similar increases were seen in the other MAP tests (see Table 1).

This report is one product of the eMINTS evaluation project. Other reports and their overall evaluation plan are available at <http://emints.more.net/evaluation>.

The eMINTS Evaluation focuses on student impacts, teacher impacts, changes in learning environments, and outcomes of project services.

Table 1
Percentage Change in MAP Test Performance, Jennings School District and Missouri
1999 to 2000

MAP Test	Percent Scoring "Proficient" or "Advanced"					
	1999		2000		Percent Change	
	Jennings	Missouri	Jennings	Missouri	Jennings	Missouri
3rd Grade Communication Arts	14.63	28.82	22.79	31.71	55.78	10.03
3rd Grade Science	12.20	34.73	34.90	44.89	186.07	29.25
4th Grade Mathematics	13.67	35.29	18.07	36.72	32.19	4.05
4th Grade Social Studies	8.17	25.99	30.25	37.70	270.26	45.06
7th Grade Communication Arts	8.79	30.48	13.65	32.28	55.29	5.91
7th Grade Science	3.81	14.50	4.02	15.27	5.51	5.31
8th Grade Mathematics	1.40	10.36	3.60	14.05	157.14	35.62
8th Grade Social Studies	18.69	36.43	22.87	42.33	22.36	16.20
10th Grade Mathematics	1.14	9.72	1.04	10.35	-8.77	6.48
10th Grade Science	0.57	4.52	4.71	5.85	726.32	29.42
11th Grade Communication Arts	6.87	23.41	6.85	22.78	-0.29	-2.69
11th Grade Social Studies	4.84	14.03	1.39	16.69	-71.28	18.96

Source: <http://www.dese.state.mo.us/schooldata/>

The Jennings School District has participated in the MINTs and eMINTS programs from the time of these programs' inception. More than any other participating district, Jennings has made it a priority to provide teachers with training in the instructional uses of technology and has expanded networked classrooms throughout its school buildings. This policy brief summarizes the qualitative and quantitative changes associated with Jennings' professional development and classroom technology efforts.

Qualitative Impacts

According to interviews with the two Jennings MINTs teachers in 1999, enrollment in a MINTs classroom had a remarkable impact on the attitude and performance of Jennings' students. These observed impacts on student esteem, confidence, behavior, and quality of work is consistent with those described in other MINTs classrooms (Bickford, et al., 2000) and eMINTS classrooms (eMINTS, 2001). Teachers report that students in the MINTs and eMINTS classrooms are highly motivated and try very hard to consistently produce their best work. This passage from these interviews summarizes the experience of students in the MINTs classrooms:

I feel that the largest impact on the students is that they feel they can achieve just about anything that they put their minds to now. I feel that it gives them a channel to exercise talents that they didn't think they had. They believe in themselves a little bit more. All the visitors we've had in our classrooms the past two years people have expressed awe at what [the

students] are doing in the classroom. This has really boosted morale, with parents and with students.

We have had kids who are labeled learning disabled and behavior disordered [but] you can't tell those students apart from the others. [The MINTs experience] brings those kids up to the level of achievement of your gifted students.

One of the biggest impacts is their attitude toward school. The motivation and enthusiasm [among students] is just something you don't see in a classroom in a normal situation. The students now seem to have goals. They see themselves somewhere in the future either involved in some kind of a technology profession or in a college, looking at technology as a profession. Prior to this they didn't have technology in the homes, they still don't, they can't wait to be here at school, they want to be involved in what's going on. They feel that now 'I can make it in this world.'

Quantitative Impacts

Beyond the differences in MAP performance seen in Table 1, the analysis of test score data collected as part of the 2000 MAP test shows statistically significant increases for students enrolled in computer classrooms in three of the four tests administered in 3rd and 4th grades (see Table 2). There were no significant differences in the 3rd grade Communication Arts scores. On the 3rd grade Science test, students in computer classrooms scored an average of 10 points higher than students in non-computer classrooms. On 4th grade Mathematics test students in computer classrooms scored an average of 26 points higher than students in non-computer classrooms and on 4th grade Social Studies test, students in computer classrooms scored an average of 16 points higher. Similar differences were seen in the various off-year TerraNova tests administered in grades 4 and 5. In all of these tests, students enrolled in computer classrooms scored higher than students in non-computer classrooms.

In considering these differences, it is important to note that the professional development involved with using computer classrooms effectively is only one of many innovations occurring in Jennings. This is especially true for the 3rd grade Communication Arts results. During the 1999-2000 school year Jennings teachers began receiving professional development training in literacy support from Teachers' College at Columbia University in New York. This program gave teachers in non-computer classrooms the opportunity to receive 100 hours of additional training focused on Communication Arts. Consequently, it is not surprising that students in non-computer classrooms would score as well as students in computer classrooms on the Communication Arts test.

Table 2
2000 MAP Score Differences by Classroom Type

Classroom Type	Number of Teachers	Number of Students	Percent Scoring "Proficient" or "Advanced"	MAP Score		
				Mean	Standard Deviation	P-Value
<u>3rd Grade MAP: Communication Arts</u>						
Non-Computer Classrooms	10	206	23.79	632.86	29.50	0.5738
Computer Classrooms	4	88	20.45	634.91	26.05	
All Classrooms	14	294	22.79	633.48	28.48	
<u>3rd Grade MAP: Science</u>						
Non-Computer Classrooms	10	211	31.28	625.18	39.24	0.0494
Computer Classrooms	4	87	43.68	635.25	42.09	
All Classrooms	14	298	34.90	628.12	40.28	
<u>4th Grade MAP: Mathematics</u>						
Non-Computer Classrooms	14	187	14.44	616.41	36.43	<0.0001
Computer Classrooms	3	51	31.37	642.25	29.53	
All Classrooms	17	238	18.07	621.95	36.58	
<u>4th Grade MAP: Social Studies</u>						
Non-Computer Classrooms	14	188	26.06	642.93	30.08	<0.0001
Computer Classrooms	3	50	46.00	659.26	19.92	
All Classrooms	17	238	30.25	646.36	28.99	

Modeling Differences in Student Test Performance

The student data available from the MAP tests allows for an investigation of the impact of individual student characteristics on performance (see Tables 3 and 4). These models show a net negative impact on test scores for students with an IEP or who had their test read to them orally.¹ For three of the four tests (e.g., all tests except 3rd grade Communication Arts) there is a positive impact associated with being enrolled in a computer classroom.

¹ Review of the various MAP Modification flags suggest that being identified as having an IEP and having a test administered orally identifies the same students. In each of the four tests over 95 percent of students identified as having an IEP also had the test administered orally. In effect, these two variables are interchangeable, as they both identify students with a diagnosed learning disability.

Table 3
2000 MAP Performance Models: 3rd Grade

3rd Grade MAP: Communication Arts

Variable	<u>Initial Model</u>			<u>Final Model</u>		
	Parameter Estimate	Standardized Coefficient	P-Value	Parameter Estimate	Standardized Coefficient	P-Value
Intercept	552.171	0.000	<0.0001	551.192	0.000	<0.0001
Percent of School Days in Attendance	0.873	0.116	0.0503	0.881	0.117	0.0640
Computer Class	1.947	0.033	0.5830			
<u>MAP Modification Flags</u>						
IEP Flag	-3.740	-0.044	0.7864			
Oral Reading Flag	-10.082	-0.115	0.4758	-15.160	-0.173	0.0030
Free/Reduced Lunch Flag	0.633	0.011	0.8590			
Student in building less than one year	-23.160	-0.312	0.0981			
Student in district less than one year	16.942	0.224	0.2345			
R-Square	0.0578			0.0418		
Adjusted R-Square	0.0344			0.0351		
Model P-Value	0.0178			0.0022		
Number of Students	289			289		

3rd Grade MAP: Science

Variable	<u>Initial Model</u>			<u>Final Model</u>		
	Parameter Estimate	Standardized Coefficient	P-Value	Parameter Estimate	Standardized Coefficient	P-Value
Intercept	461.653	0.000	<0.0001	462.691	0.000	<0.0001
Percent of School Days in Attendance	1.751	0.162	0.0040	1.750	0.162	0.0040
Computer Class	11.288	0.128	0.0249	11.680	0.132	0.0181
<u>MAP Modification Flags</u>						
IEP Flag	-20.047	-0.165	0.2555	-26.251	-0.216	0.0001
Oral Reading Flag	-4.442	-0.035	0.8074			
Free/Reduced Lunch Flag	2.165	0.025	0.6628			
Student in building less than one year	-42.407	-0.375	0.0179	-14.044	-0.124	0.0270
Student in district less than one year	31.286	0.269	0.0863			
R-Square	0.1201			0.1095		
Adjusted R-Square	0.0989			0.0973		
Model P-Value	<0.0001			<0.0001		
Number of Students	297			297		

Table 4
2000 MAP Performance Models: 4th Grade

4th Grade MAP: Mathematics

Variable	<u>Initial Model</u>			<u>Final Model</u>		
	Parameter Estimate	Standardized Coefficient	P-Value	Parameter Estimate	Standardized Coefficient	P-Value
Intercept	562.614	0.000	<0.0001	626.252	0.000	<0.0001
Percent of School Days in Attendance	0.675	0.096	0.1055			
Computer Class	17.161	0.223	0.0003	18.814	0.243	<0.0001
<u>MAP Modification Flags</u>						
IEP Flag	17.132	0.189	0.1214			
Oral Reading Flag	-37.297	-0.375	0.0022	-21.128	-0.215	0.0003
Free/Reduced Lunch Flag	-4.846	-0.066	0.2711			
Student in building less than one year	-25.043	-0.217	0.0035	-30.407	-0.262	<0.0001
Student in district less than one year	-8.041	-0.083	0.2666			
R-Square	0.2537			0.2270		
Adjusted R-Square	0.2305			0.2171		
Model P-Value	<0.0001			<0.0001		
Number of Students	236			236		

4th Grade MAP: Social Studies

Variable	<u>Initial Model</u>			<u>Final Model</u>		
	Parameter Estimate	Standardized Coefficient	P-Value	Parameter Estimate	Standardized Coefficient	P-Value
Intercept	590.665	0.000	<0.0001	653.342	0.000	<0.0001
Percent of School Days in Attendance	0.651	0.110	0.0758			
Computer Class	8.206	0.124	0.0508	8.495	0.128	0.0408
<u>MAP Modification Flags</u>						
IEP Flag	0.779	0.010	0.9361			
Oral Reading Flag	-5.157	-0.060	0.6332			
Free/Reduced Lunch Flag	-13.197	-0.214	0.0008	-14.114	-0.229	0.0002
Student in building less than one year	-6.715	-0.072	0.4613			
Student in district less than one year	-17.215	-0.214	0.0333	-23.259	-0.288	<0.0001
R-Square	0.1853			0.1652		
Adjusted R-Square	0.1600			0.1545		
Model P-Value	<0.0001			<0.0001		
Number of Students	232			236		

There is also a net negative impact associated with student migration. Scores for 3rd grade Science and 4th grade Mathematics students who have been enrolled in their current school building for less than one year (e.g., students who transferred into their school midyear) are lower than those for students who were enrolled in that building for at least one previous school year. There is a similar impact on 4th Grade Social Studies scores for students who have been enrolled in the Jennings district for less than one year.²

Conclusions

The results of this short analysis suggest that the range of school improvement programs in place in the Jennings School District is improving student performance. Among these school improvement efforts is the installation of computer classrooms and training of teachers to use the computers and technology effectively. Analysis of teachers' comments of student work and activities, as well as quantitative analyses of 2000 MAP scores show a consistently positive impact on students enrolled in these classrooms. The analysis of student test scores will continue with data collected from the 47 schools participating in the first round of the eMINTS program. These analyses will provide a much more detailed account of how enrollment in computer classrooms is related to test performance. At this point, the results from Jennings suggest that these computer classrooms, the MINTs and eMINTS classrooms, have a positive impact on student performance.

Works Cited

Bickford, Adam, Barbara Hammer, Patrick McGinty, Priscilla McKinley and Susan Mitchell, 2000. *MINTs Project Evaluation Report*.

<http://www.oseda.missouri.edu/education/emints/evaluation.html>.

eMINTS Evaluation Project, 2001. *Teacher Perception of Student Change in FY00 eMINTS Classrooms*. <http://emints.more.net/evaluation/focus/index.html>.

² Analysis of the interaction between the migration variables (i.e., students who have been in their current building for less than one year and students who have been in enrolled in the Jennings district for less than one year) and enrollment in a computer class show that for the 3rd grade Science scores, these factors are independent, i.e., that the interaction term is not statistically significant. For the 4th grade Mathematics and Social Studies tests none of the students in the computer classrooms had been enrolled in either the building or the district for less than one year.