STUDY ONE: EFFECTS OF DEGREE OF IMPLEMENTATION

Purpose

The purpose for this analysis was to examine differences that may exist between schools implementing the Sharon Wells Mathematics (SWM) curriculum and comparable schools using any other mathematics curriculum

Methods

For this study, passing rates in grades 3 through 6 were examined. The sample size for this analysis included 217 schools for grade 3, 209 for grade 4; 185 for grade 5; and 26 for grade 6 (see Appendices C through F for supplementary information by grade level).

The variables for this analysis consist of one independent, or grouping, variable and five dependent variables. The independent variable for this analysis was *Degree of Implementation* of the Sharon Wells curriculum. This variable was derived by summing the number of grades per school, across years (1999 through 2003) that reported using the SWM curriculum (see descriptive statistics in Appendices). Total implementation scores were then divided into three groups: (a) not implementing (comparison) schools; (b) schools with a moderate implementation score; and (c) schools with higher implementation scores. A higher implementation score indicates that SWM curriculum is used in multiple grades for a majority of years considered in this study. The variable used as a covariate was the *average accountability rating* for each campus. This covariate was used to adjust for initial differences between or among the campuses examined in this study.

The dependent variable for this analysis was *Average passing rates for each grade*. The grade-level passing rate was derived by averaging the campus passing rates for each grade (i.e., 3, 4, 5, 6) across years. An overall passing rate

variable was also calculated for each campus by averaging across grades and years.

For the present study, we made comparison of group means using ANOVA (analysis of variance), and ANCOVA (analysis of covariance).

Results and Conclusions

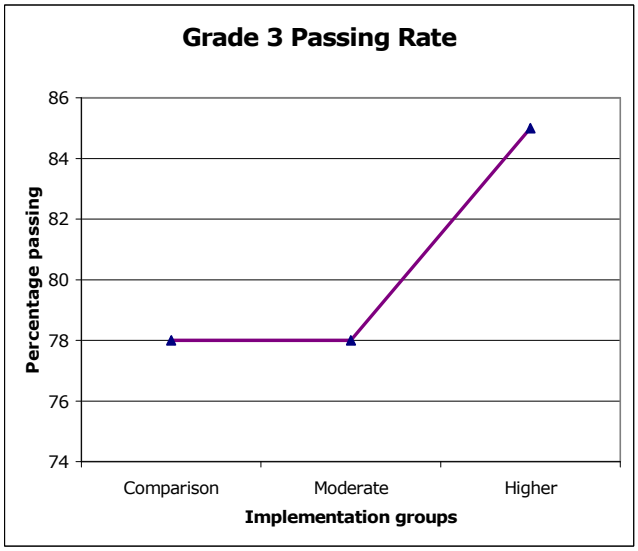
Grade-level passing rates were examined between schools implementing the SWM curriculum and those implementing another mathematics curriculum. Results from these analyses revealed statistically significant differences at grades 3, 4, and 5, but not for grade 6 (see Table S1.1).

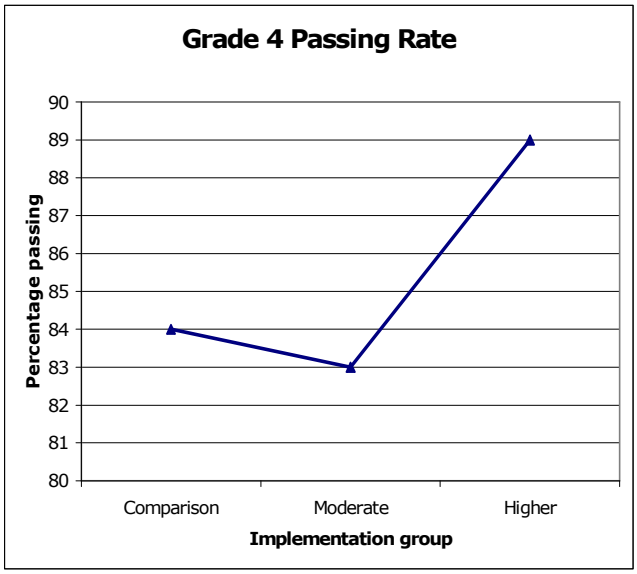
A significant difference in passing rates between school groups was found for grade 3 ($\underline{F}$ (2, 216) = 6.07, $\underline{p}$ = .003, η^2 = .054); for grade 4 ($\underline{F}$ (2, 208) = 3.92, $\underline{p}$ = .021, η^2 = .037; and grade 5 ($\underline{F}$ (2, 184) = 3.53, $\underline{p}$ = .031, η^2 = .037). No significant difference was found, however, between school groups for grade 6 ($\underline{F}$ (2, 25) = .491, $\underline{p}$ = .619, η^2 = .041.

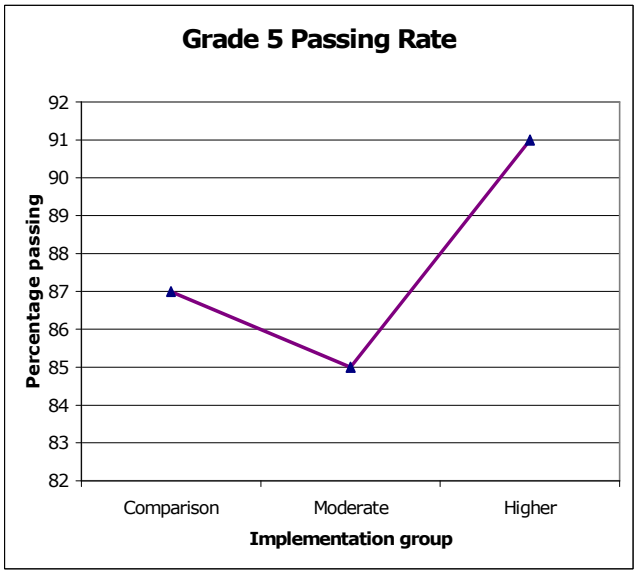
Table S1.1 *Descriptive statistics by grade-level and campus for degree of implementation groups.*

	Overall passing rate			
Implementation groups	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**
Comparison schools (none)				
Mean	.78	.84	.87	.88
Sample size	108	104	92	19
SD	.13	.13	.10	.06
Moderate implementation				
Mean	.78	.83	.85	.93
Sample size	58	54	44	2
SD	.13	.14	.14	.03
Greater implementation				
Mean	.85	.89	.91	.89
Sample size	51	51	49	5
SD	.06	.06	.05	.07
Total sample				
Mean	.80	.85	.88	.89
Sample size	217	209	185	26
SD	.12	.12	.11	.06

These results seem to indicate an interesting pattern of achievement in mathematics for the schools in this study. First, schools that have used the SWM curriculum for a longer period of time had significantly higher passing rates than schools not implementing. This suggests that students' mathematics achievement is enhanced by having the mathematics curriculum in place over multiple years. Second, schools that have more recently begun implementing the SWMC, whether whole school or in selected grades are unlikely to see an immediate jump in passing rates within the short-term. Third, results for grade 6 passing rate suggest that the SWM curriculum is less effective for students in this grade. This finding, however, should be interpreted with some caution given the low number of schools in the implementing groups – a result of many districts' decisions to move grade 6 into middle-level schools.







A second analysis was conducted to examine mean differences between implementation groups based on *Overall passing rate of the campus* for grades 3, 4, and 5 only. A 1 X 3 ANCOVA (Analysis of covariance) was conducted with implementation groups (e.g., none, moderate, higher) as the independent variable and *average accountability rating* as the covariate. Results from this analysis indicate a statistically significant difference between implementation groups favoring the SWM schools (see Table S1.2).

Table S1.2 *Test of between-subjects effects*

Source	df	Mean Square	F Ratio	Significance	Partial η^2
Accountability rating	1	.319	280.64	.001	.644
Implementation group	2	.010	8.54	.001	.100
Error	155	.001			
Corrected total	158				

Differences revealed by this analysis suggest that a large proportion of the variance between the groups of schools is accounted for by their average accountability rating. This finding was expected given that accountability ratings are derived, in part, based upon students' mathematics achievement. Beyond the variance accounted for by the accountability rating, however, the degree of implementation at each campus still accounted for a proportion of the variance in test scores that is considered to be both statistically and practically significant. In other words, holding the accountability rating of schools constant, the degree of implementation of the SWM curriculum still emerges as a significant factor predicting students' mathematics achievement.