

## STUDY THREE: REPEATED MEASURES ANALYSIS OF PASSING RATES BY IMPLEMENTATION GROUPS

### **Purpose**

The purpose of this study was to examine changes in the passing rates of implementing and comparison schools during the study years (1999 through 2003). This analysis is important in helping to understand whether changes in implementing schools was really different from changes found in comparison schools. The extent to which differences are detected provides an indicator of the effectiveness of the SWM curriculum in implementing schools.

### **Methods**

For this study, the passing rates of students in 180 schools were examined across academic years. Of those included in this analysis, 51% were comparison-group schools; 49% were treatment-group schools. A subgroup of schools was established based upon the degree to which treatment schools were implementing the SWM curriculum. Of the total sample, 23% were classified as moderate-implementing schools, and 26% were classified as greater-implementing schools (see Appendices C through F for supplementary information by grade level and academic years). This created an uneven sample size for the following analyses, however the homogeneity-of-variance assumption remained tenable, mean that the uneven sample size did not affect the  $F$  test outcomes.

Analyses for this study involved two independent variables, and one dependent variable. The first independent variable was time, or years of the study. This variable is a repeated-measures factor because it examines the dependent variable for each school over the course of the five years included in this study (i.e., 1999 through 2003). The method used for deriving the second independent variable, *Degree of implementation* has been described previously.

The dependent variable for this study was *Campus passing rate*. This variable was derived by averaging across the grades (i.e., grades 3, 4, & 5) to obtain an average school passing rate, or campus passing rate. Campus passing rates were calculated for each year for each school. Follow-up analyses examined passing rates for individual grades.

For the present study, repeated-measures ANOVA were used. For each analysis, the assumption of “sphericity” was examined, but this assumption was not met. Therefore, in reporting results, the Greenhouse-Geisser statistic was used.

## Results and Conclusions

Table S3.1 provides descriptive statistics for overall passing rate by degree of implementation and by year. Results from this 3 X 5 repeated measures MANOVA were statistically significant (Wilks'  $\lambda = .642$ ,  $F(4, 174) = 24.23$ ,  $p = .001$ ,  $\eta^2 = .36$ ). This analysis revealed significant main-effect differences for both degree of implementation ( $F(2, 177) = 5.12$ ,  $p = .007$ ,  $\eta^2 = .06$ ) and year ( $F(1, 177) = 40.76$ ,  $p = .001$ ,  $\eta^2 = .19$ ), as well as a significant difference for the interaction

effect, Time X Implementation ( $F(2, 177) = 6.98$ ,  $p = .001$ ,  $\eta^2 = .07$ ).

This result indicates that all schools, both treatment and comparison, had statistically significant

changes over time, as well as statistically significant differences based upon the extent to which the SWM curriculum was implemented in the school. Moreover, the significant interaction effect revealed that gains made in overall campus passing rates were statistically different over time for schools that were either comparison or treatment schools. An examination of the cell means reveals that passing rates tended to be highest for schools that had a higher degree of implementation.

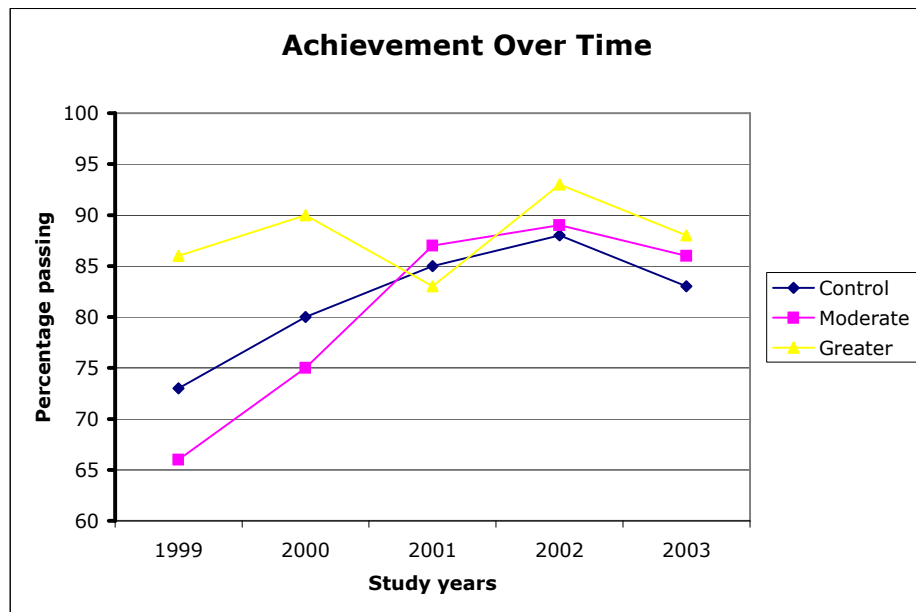


Table S3.1 *Descriptive statistics of all grades for each study year by degree of implementation*

| <b>Year and degree of implementation</b> | <b>Mean</b> | <b>SD</b> | <b>N</b> |
|--|-------------|-----------|----------|
| <u>Passing rate 1999</u>                 |             |           |          |
| Comparison                               | .73         | .26       | 91       |
| Moderate                                 | .68         | .36       | 42       |
| Greater                                  | .86         | .14       | 47       |
| <u>Passing rate 2000</u>                 |             |           |          |
| Comparison                               | .80         | .15       | 91       |
| Moderate                                 | .75         | .28       | 42       |
| Greater                                  | .90         | .06       | 47       |
| <u>Passing rate 2001</u>                 |             |           |          |
| Comparison                               | .85         | .14       | 91       |
| Moderate                                 | .87         | .06       | 42       |
| Greater                                  | .83         | .19       | 47       |
| <u>Passing rate 2002</u>                 |             |           |          |
| Comparison                               | .88         | .14       | 91       |
| Moderate                                 | .89         | .15       | 42       |
| Greater                                  | .93         | .04       | 47       |
| <u>Passing rate 2003</u>                 |             |           |          |
| Comparison                               | .83         | .09       | 91       |
| Moderate                                 | .86         | .07       | 42       |
| Greater                                  | .88         | .06       | 47       |

Exploratory repeated measures ANOVAs were conducted to examine differences that might be present for each grade level (i.e., grades 3, 4, & 5) during the study years. These analyses revealed significant change in passing rates for all schools over time, and a significantly different rate of change for

schools in the comparison, moderate implementing and greater implementing groups.

Grade 3 over time. Repeated measures ANOVA for passing rate across years for Grade 3 students revealed a similar pattern of differences to the overall analysis. Both the repeated measure (time) (Wilks'  $\lambda = .585$ ,  $F(4, 218) = 37.54$ ,  $p = .001$ ,  $\eta^2 = .415$ ) and the interaction time X implementation group were statistically significant (Wilks'  $\lambda = .898$ ,  $F(4, 436) = 2.93$ ,  $p = .003$ ,  $\eta^2 = .052$ ). Examination of cell means suggest that greater rates of passing in Grade 3 were found among students in schools with a greater degree of implementation of the SWM curriculum. This pattern seems to hold true with the exception of 2001 when passing rates in implementing schools dipped slightly below the average of comparison schools. A mean comparison of student performance in schools with a moderate versus a greater degree of implementation also shows a higher rate of performance for students in the greater implementing schools.

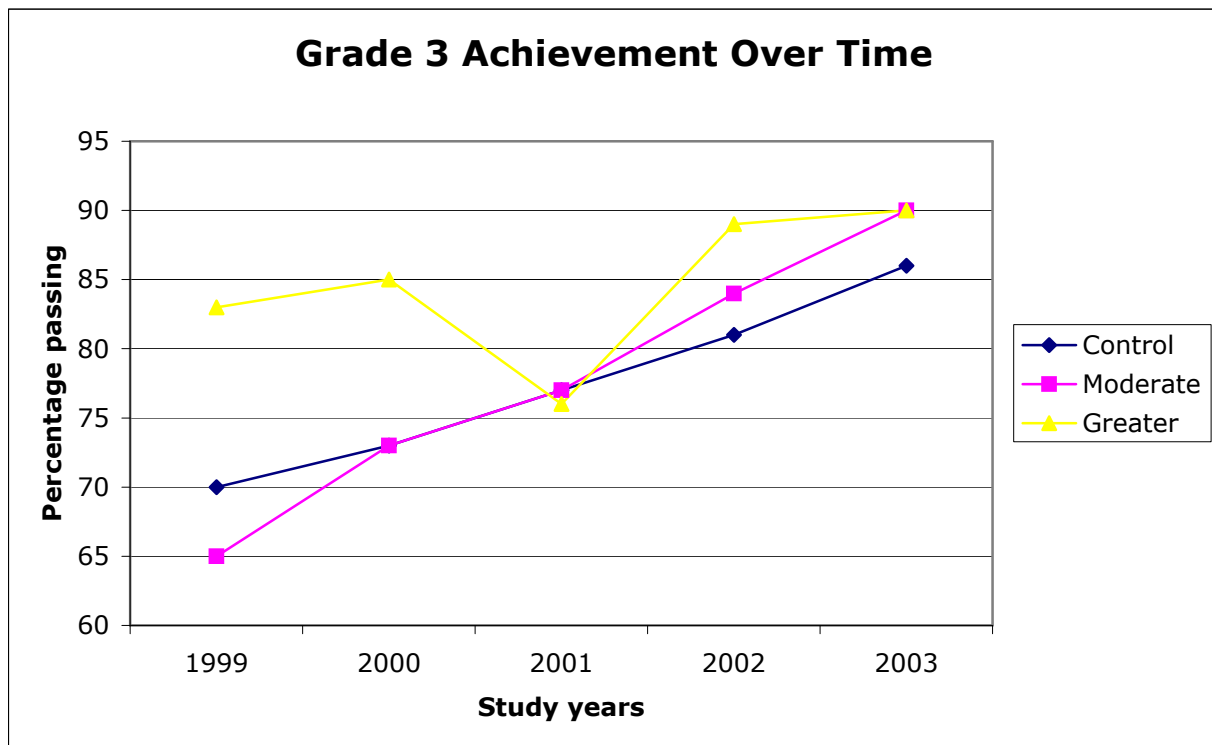


Table S3.2 *Descriptive statistics of Grade 3 for each study year by degree of implementation*

| <b>Year and degree of implementation</b> | <b>Mean</b> | <b>SD</b> | <b>N</b> |
|--|-------------|-----------|----------|
| <u>Grade 3 passing rate</u>              |             |           |          |
| <u>1999</u>                              |             |           |          |
| Comparison                               | .73         | .26       | 91       |
| Moderate                                 | .68         | .36       | 42       |
| Greater                                  | .86         | .14       | 47       |
| <u>Grade 3 passing rate</u>              |             |           |          |
| <u>2000</u>                              |             |           |          |
| Comparison                               | .80         | .15       | 91       |
| Moderate                                 | .75         | .28       | 42       |
| Greater                                  | .90         | .06       | 47       |
| <u>Grade 3 passing rate</u>              |             |           |          |
| <u>2001</u>                              |             |           |          |
| Comparison                               | .85         | .14       | 91       |
| Moderate                                 | .87         | .06       | 42       |
| Greater                                  | .83         | .19       | 47       |
| <u>Grade 3 passing rate</u>              |             |           |          |
| <u>2002</u>                              |             |           |          |
| Comparison                               | .88         | .14       | 91       |
| Moderate                                 | .89         | .15       | 42       |
| Greater                                  | .93         | .04       | 47       |
| <u>Grade 3 passing rate</u>              |             |           |          |
| <u>2003</u>                              |             |           |          |
| Comparison                               | .83         | .09       | 91       |
| Moderate                                 | .86         | .07       | 42       |
| Greater                                  | .88         | .06       | 47       |

Grade 4 over time. Repeated measures ANOVA for passing rate across years for Grade 4 students revealed a similar pattern of differences to both the Grade 3 analysis as well as the overall analysis of passing rate in all grades. Both the repeated measure (time) (Wilks'  $\lambda = .631$ ,  $F(4, 208) = 29.86$ ,  $p = .001$ ,  $\eta^2 = .369$ ) and the interaction time X implementation group were statistically significant (Wilks'  $\lambda = .896$ ,  $F(8, 416) = 2.93$ ,  $p = .004$ ,  $\eta^2 = .054$ ). Examination of cell means suggest that greater rates of passing in Grade 4, as was the case for Grade 3, were also found among students in schools with a greater degree of implementation of the SWM curriculum. This pattern seems to hold true with the exception of 2001 when passing rates in implementing schools also dipped slightly below the average of comparison schools. A mean comparison of student performance in schools with a moderate versus a greater degree of implementation also shows a higher rate of performance for students in the greater implementing schools.

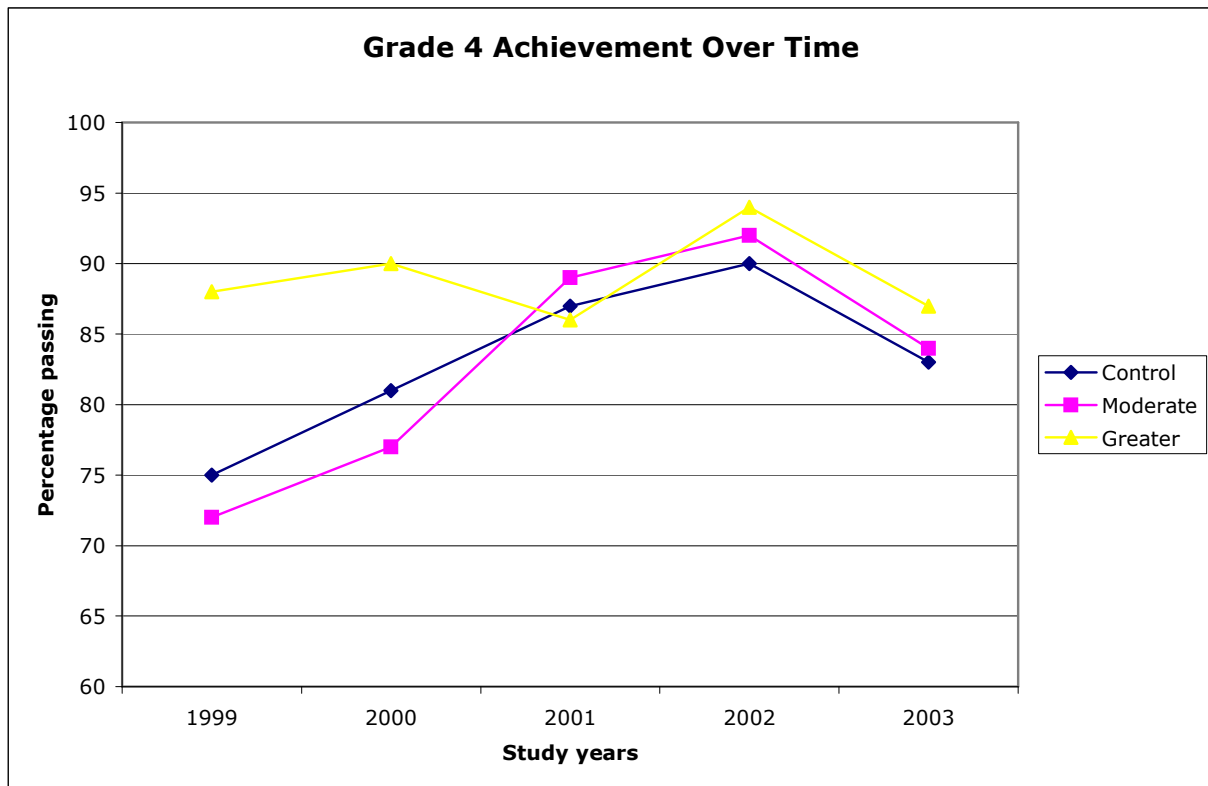


Table S3.3 *Descriptive statistics of Grade 4 for each study year by degree of implementation*

| <b>Year and degree of implementation</b> | <b>Mean</b> | <b>SD</b> | <b>N</b> |
|--|-------------|-----------|----------|
| <u>Grade 4 passing rate</u>              |             |           |          |
| <u>1999</u>                              |             |           |          |
| Comparison                               | .75         | .27       | 105      |
| Moderate                                 | .72         | .34       | 54       |
| Greater                                  | .88         | .15       | 51       |
| <u>Grade 4 passing rate</u>              |             |           |          |
| <u>2000</u>                              |             |           |          |
| Comparison                               | .81         | .18       | 105      |
| Moderate                                 | .77         | .26       | 54       |
| Greater                                  | .90         | .07       | 51       |
| <u>Grade 4 passing rate</u>              |             |           |          |
| <u>2001</u>                              |             |           |          |
| Comparison                               | .87         | .17       | 105      |
| Moderate                                 | .89         | .13       | 54       |
| Greater                                  | .86         | .20       | 51       |
| <u>Grade 4 passing rate</u>              |             |           |          |
| <u>2002</u>                              |             |           |          |
| Comparison                               | .90         | .17       | 105      |
| Moderate                                 | .92         | .13       | 54       |
| Greater                                  | .94         | .08       | 51       |
| <u>Grade 4 passing rate</u>              |             |           |          |
| <u>2003</u>                              |             |           |          |
| Comparison                               | .83         | .11       | 105      |
| Moderate                                 | .84         | .10       | 54       |
| Greater                                  | .87         | .07       | 51       |

Grade 5 over time. Repeated measures ANOVA for passing rate across years for Grade 5 students again revealed a fairly similar pattern of differences to the overall analysis. Again, both the repeated measure (time) (Wilks'  $\lambda = .603$ ,  $F(4, 180) = 29.64$ ,  $p = .001$ ,  $\eta^2 = .397$ ) and the interaction effect of time X implementation group were statistically significant (Wilks'  $\lambda = .881$ ,  $F(8, 360) = 2.93$ ,  $p = .003$ ,  $\eta^2 = .062$ ). Examination of cell means for Grade 5 suggest that greater rates of passing were found among students in schools with a greater degree of implementation of the SWM curriculum. This pattern seems to hold true with the exception of 2001 when passing rates for all grades in implementing schools dipped slightly below the average of comparison schools. A mean comparison of student performance in schools with a moderate versus a greater degree of implementation also shows an equal or higher rate of performance for students in the greater implementing schools.

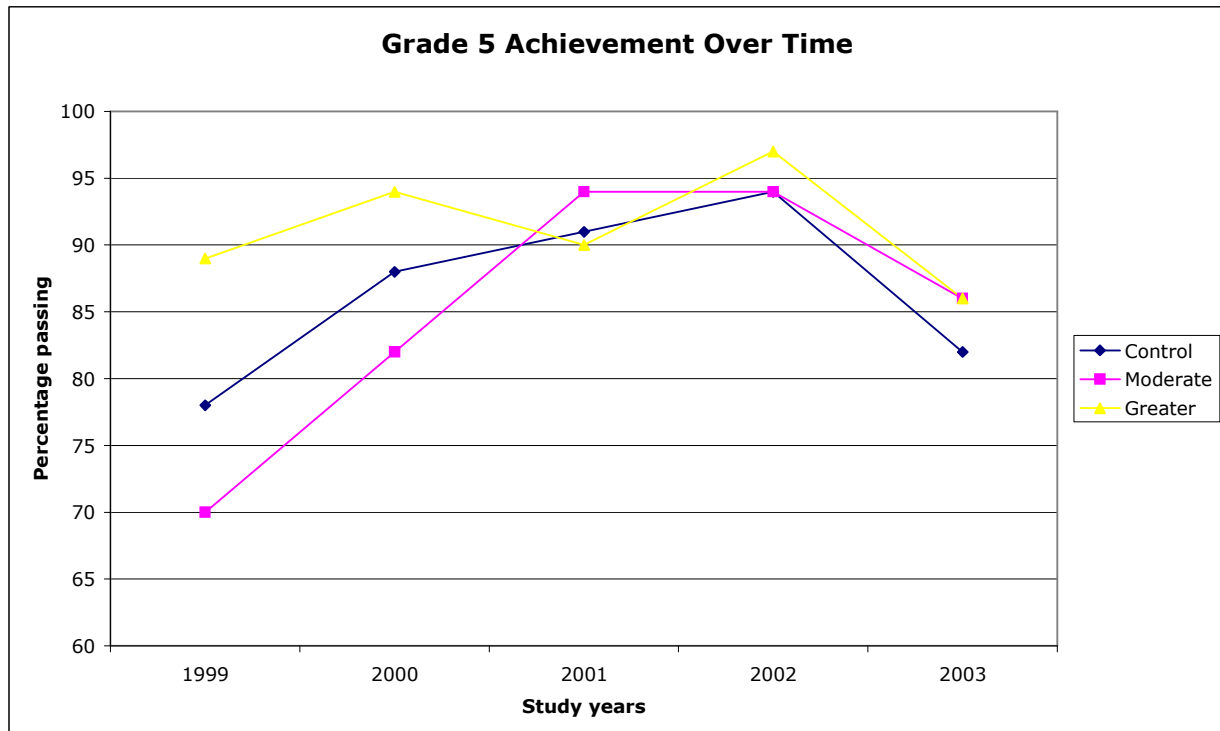


Table S3.4 *Descriptive statistics of Grade 5 for each study year by degree of implementation*

| <b>Year and degree of implementation</b> | <b>Mean</b> | <b>SD</b> | <b>N</b> |
|--|-------------|-----------|----------|
| <u>Grade 5 passing rate</u>              |             |           |          |
| <u>1999</u>                              |             |           |          |
| Comparison                               | .78         | .27       | 93       |
| Moderate                                 | .70         | .37       | 44       |
| Greater                                  | .89         | .15       | 49       |
| <u>Grade 5 passing rate</u>              |             |           |          |
| <u>2000</u>                              |             |           |          |
| Comparison                               | .88         | .15       | 93       |
| Moderate                                 | .82         | .30       | 44       |
| Greater                                  | .94         | .05       | 49       |
| <u>Grade 5 passing rate</u>              |             |           |          |
| <u>2001</u>                              |             |           |          |
| Comparison                               | .91         | .15       | 93       |
| Moderate                                 | .94         | .06       | 44       |
| Greater                                  | .90         | .20       | 49       |
| <u>Grade 5 passing rate</u>              |             |           |          |
| <u>2002</u>                              |             |           |          |
| Comparison                               | .94         | .14       | 93       |
| Moderate                                 | .94         | .14       | 44       |
| Greater                                  | .97         | .02       | 49       |
| <u>Grade 5 passing rate</u>              |             |           |          |
| <u>2003</u>                              |             |           |          |
| Comparison                               | .82         | .11       | 93       |
| Moderate                                 | .86         | .09       | 44       |
| Greater                                  | .86         | .10       | 49       |

Discussion of time and implementation effects. The results from the analyses of change over time and of the effects of implementation on students' passing rate, overall, present a picture favoring the use of SWM curriculum in schools similar to those included in this study. Schools implementing the SWM curriculum to a higher degree clearly had an advantage over comparison and moderate implementing schools. As tests and testing requirements have changed in Texas, the advantage of this group, although still significantly greater, has begun to diminish slightly. Change in testing during 2001 clearly put students in implementing schools at a disadvantage, but since that year, the implementing schools have consistently reported passing rates that exceed non-implementing schools. Even with the new TAKS test implemented in SY 2002-2003, students in SWM curriculum schools continued to have higher rates of passing.

The first year of passing rates considered for this study, 1999, marked the sixth year the SWM curriculum has been available for Texas schools. The advantage seen for greater-implementing schools seen in 1999 was likely the result of consistent use prior to the study period. Further evaluation work should continue to track performance of the sample schools past SY 2002-2003 to examine whether the curriculum and schools implementing Sharon Wells are able to adjust to new state-level testing demands and again boost performance of schools serving populations of students historically considered to be lower-performing.