Accelerating Social Studies Achievement:

A Study of the Effectiveness of a Discovery Education Social Studies Digital Alignment Strategy

Indianapolis Public Schools
2009 - 2011

EXECUTIVE SUMMARY

Discovery Education provides engaging digital resources to schools in all core-curricular subject areas with the goal of making educators more effective and increasing student achievement. In 2009, Discovery Education partnered with the Indianapolis Public Schools (IPS) to develop a digital curriculum resource to improve the instruction of social studies, engage students in learning, and improve student performance on the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+) in social studies. For this effort, Discovery Education embedded digital content available through its Discovery Education *streaming* service to the IPS standards-based K-12 social studies pacing guides. Discovery Education also provided robust professional development designed to build teachers' digital literacy, improve instructional delivery and support teachers during the implementation of the digital alignment project.

This study was conducted by researchers at Discovery Education to assess the effectiveness of the social studies digital alignment strategy in improving students' performance in social studies. Ten schools within IPS were selected to participate in a three-year pilot of the alignment strategy while the other 51 schools within IPS continued to use the IPS K-12 social studies pacing guides without embedded digital content. Propensity score matching was used to develop an appropriate group of 10 schools from among the 51 non-pilot schools that could be compared to the pilot schools and to estimate the effects of the Discovery Education social studies digital alignment strategy on the performance of fifth-grade and seventh-grade students on the ISTEP+ in social studies administered in 2010 and 2011. These grades were selected for analysis because they are the ones in which the ISTEP+ in social studies is administered.

Analyses of variance were conducted to assess differences in the use of Discovery Education digital content between fifth-grade and seventh-grade teachers in the pilot schools and differences in gains on the ISTEP+ in social studies between the 10 pilot and 10 control schools. Both fifth-grade and seventh-grade teachers increased their use of the Discovery Education digital content over the two-year period of the pilot. By year two of the pilot, on average, teachers used Discovery Education digital content more than twice per week. However, while only 42% of the digital content used by fifth-grade teachers was related to social studies, about 62% of the digital content used by seventh-grade teachers was related to social studies. This finding suggests that, in comparison to fifth-grade teachers, seventh-grade teachers were more likely to use the Discovery Education digital resources and pacing guides as intended.

The percent of fifth-grade students passing the ISTEP+ in social studies within pilot schools increased in 2010, while those in the non-pilot schools decreased. However, the overall passing rates for pilot and non-pilot schools were not significantly different. At the end of 2011, the percentages of fifth-grade students passing the ISTEP+ social studies increased for both pilot and non-pilot schools. Therefore, at the end of second year of the pilot, the passing rates for pilot and non-pilot were statistically similar.

In contrast, the percent of seventh-grade students passing the ISTEP+ in social studies within pilot schools increased significantly over the two year pilot period and by the second year of the pilot surpassed the passing rate at non-pilot schools. By 2011, the percent of students passing the test had increased by 29 percentage points in the pilot schools while non-pilot schools experienced only an increase of 8 percentage points. These results provide strong evidence that the Discovery Education digital alignment strategy is effective when properly implemented. In IPS, significant differences between pilot schools and non-pilot schools emerged only when digital content specifically related to social studies was used more than twice per week.

The results of this study will be used to modify professional development directed at fifth-grade teachers and to inform continued implementation of the Discovery Education social studies digital alignment strategy during the third year of the pilot in Indianapolis Public Schools.

BACKGROUND AND PURPOSE

During the 2008-2009 academic year, representatives of the Indianapolis Public Schools (IPS) partnered with Discovery Education to develop a digital curriculum resource to improve the instruction of social studies, engage students in learning, and improve student performance on the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+) in social studies. To accomplish these goals, Discovery Education aligned the best of Discovery Education social studies digital assets, including videos, instructional images, audios, and writing prompts, to the IPS social studies K-12 pacing guides. Different levels of assets were aligned to the pacing guides so that they would be appropriate for students performing above, below or at grade level. Discovery Education also developed teacher guides and model lessons with embedded social studies digital content and suggested activities appropriate for use by beginning, intermediate, and veteran teachers. In addition, Discovery Education provided teachers with robust professional development designed to build teachers' digital literacy, improve instructional delivery, and support teachers during the implementation of the project.

During the summer of 2009, IPS selected 10 out of its 61 schools to participate in a pilot of the implementation of the Discovery Education social studies digital alignment strategy during the 2009-2010 academic year. The purpose of this study was to evaluate the impact of the digital alignment strategy on the performance of fifth-grade and seventh-grade students on the 2010 and 2011 ISTEP+ in social studies. These grades were selected for the analysis because they are the ones in which the ISTEP+ in social studies is administered.

STUDY DESIGN

This study relies on secondary analyses of school-level ISTEP+/social studies performance data available on the website of the Indiana Department of Education[1] and on Discovery Education administrative records of frequency of social studies digital content use by IPS pilot schools during the 2009 – 2010 and 2010-2011 academic years. ISTEP+/Social Studies performance data for the 2008-2009, 2009-2010 and 2010-2011 academic years were analyzed to compare changes in the performance levels of the 10 schools included in the Discovery Education pilot with that of comparable schools within IPS that did not participate in the DE pilot.

Schools that participated in the pilot were selected by decision-makers within the IPS district to represent variability in school types that exist within IPS (i.e., public, community, or charter schools) and in the demographic background and academic performance of students enrolled in the IPS district. In accordance with the US Department of Education's *What Works Clearinghouse's* standards for research on the effectiveness of education interventions, propensity score matching was used to develop an appropriate group of schools that could be compared to the pilot schools and to estimate the effects of the Discovery Education social studies digital alignment strategy on performance on the ISTEP+ in social studies administered in 2010 and 2011.[2]

According to the *What Works Clearinghouse*, in a non-randomized study, it is preferable to have cases in the educational intervention group and in a "control" group that are as similar as possible on many background characteristics in order to eliminate competing explanations for

treatment effects.[3] The school-level background characteristics used to match non-participating schools with those that participated in the Discovery Education pilot included (a) the percent of students participating in the free and reduced meals program within the school, (b) the percent of students from ethnic minority backgrounds enrolled in the school; and (c) the percent of fifth-grade and seventh-grade students within the school passing the 2009 ISTEP+/ Social Studies, which was administered the year prior to the implementation of the Discovery Education pilot.[4] Based on the propensity score analysis, 10 control schools within the Indianapolis Public School district were identified as the closest match for the 10 schools that participated in the Discovery Education pilot. Four of the control schools served students enrolled in the fifth-grade and six served students enrolled in the seventh-grade. Teachers within the control/non-pilot schools used the IPS grade-appropriate social studies pacing guides but did not have access to the media-embedded social studies pacing guides or the Discovery Education *streaming* digital content used in the pilot schools.

STUDY FINDINGS

Project Implementation

Professional Development Activities

Discovery Education focuses on promoting the use of digital media to enrich curricula, improve teaching and make a discernible difference in student achievement. With these goals in mind, Discovery Education professional development services focus primarily on the integration of technology, research-based instructional strategies, and digital media into standards-based instruction. In Indianapolis, professional activities were designed to incorporate many of the characteristics that research has identified as "best-practices" for effective teacher training.[5] Professional development activities (a) were spread out over time with opportunities for follow-up learning and feedback; (b) they incorporated a job-embedded approach that provided teachers an opportunity to learn how to use digital media within the context of their curricular needs; (c) provided opportunities for teachers to develop new standards-based social studies lessons and to share them with their colleagues, thus they helped to build communities of colleagues within and across school settings; and (d) included one-on-one classroom support designed to help teachers adopt new approaches to social studies instruction and to change the context of learning for their students.

During the first year of the pilot, approximately 45 teachers in grades 5 and 7-12 in each of the selected pilot schools where provided with about 42 hours of training facilitated by Discovery Education Professional Development (DEPD) Specialists. Two days of training were designed to build teachers' skills to use Discovery Education digital services and the media-embedded social studies pacing guides. These trainings were followed by additional sessions where teachers from across the different pilot schools engaged with their peers in the development of social studies lesson plans and instructional activities that integrated digital media and provided opportunities for students to work collaboratively and to use the technology available within the classroom. Four of these hands-on six-hour on-site classroom support sessions were provided to each grade cohort.

DE Professional Development (DEPD) Specialists, in conjunction with key instructional leaders at IPS, developed a rubric to assist teachers to reflect upon the use of the social studies pacing guides, the integration of the digital media, and the use of instructional practices designed to increase student engagement. During the on-site classroom support session DEPD Specialists worked side by side to provide in-class support as well as observe the classroom teacher using the rubric. The DEPD Specialist was able to create observation notes enabling the classroom teacher to determine if they had demonstrated the appropriate integration of digital media and use of the social studies pacing guides. The level of student engagement was also noted during observations.

Classroom teachers also had the opportunity to differentiate the way in which the DEPD Specialists were used in the classroom. Beyond the use of the rubric and classroom observation, DEPD Specialist modeled the instruction to individual, small, and whole groups of students as well as demonstrated the use of the technology in the classroom. The one-on-one sessions also provided an opportunity for teachers to reflect on their skills and identify where additional training was needed. Each teacher was observed four times throughout the first year of the pilot.

During the second year of the pilot, teachers were provided with an additional 24 hours of face-to-face hands-on lesson and instruction planning time with their peers. In addition, on average, each teacher was observed and provided with on-site individual classroom support and feedback twice during the year. Integrating the pacing guides was a core component of the first year of the pilot while the second year focused on deeper integration of the digital content, standards, and appropriate instructional strategies to increase student engagement. Since the pilot group remained mostly the same educators over the two years, DEPD Specialists were able to differentiate the instruction and professional learning for the pilot educators. Approximately 2/3 of the pilot teachers remained the same while 1/3 of the pilot teachers changed as a result of staff attrition.

The comprehensive training model implemented in Indianapolis was expected to result in effective use of social studies digital content and adoption of technology-based instructional approaches among teachers and improvements in performance on the ITSEP+ in social studies among the students enrolled in the pilot schools.

Teachers' Use of Discovery Education Digital Content

Teachers in the pilot schools had access to the entire collection of K-12 digital content that is available within the Discovery Education *streaming* service, in addition to the media-embedded social studies pacing guides. Therefore, it was possible for teachers at pilot schools to use digital content in other core subject and curriculum areas. The fifth-grade teachers are in mostly self-contained classroom environments teaching all subject areas while the seventh-grade teachers teach only social studies. Analysis of variance (ANOVA) was used to examine differences in fifth-grade and seventh-grade teachers' use of the Discovery Education digital service, overall and specifically in the core subject of social studies.

Both fifth-grade and seventh-grade teachers increased the frequency with which they used Discovery Education digital services during the second year of the pilot (see Table 1 in the Appendix for results of statistical test.) While during the first year of the pilot they used Discovery Education *streaming* services about twice per week, by the second year of the pilot they were using it more than twice per week. However, there were significant differences between fifth-grade and seventh-grade teachers in the subject areas in which they used Discovery Education digital content. During both pilot years, about 61% of the digital content used by seventh-grade teachers was related to social studies. In contrast, during both pilot years, only about 42% of the media content used by fifth-grade and seventh-grade teachers was related to social studies.

Table 1.
Teachers' Average Weekly Use of Discovery Education Digital Content

Pilot/Academic Year	*Fifth- Grade Teachers Mean (SD)*	*Seventh-Grade Teachers Mean (SD)*	*F statistic*
Pilot Year 1 (2009 – 2010)	1.73 (.42)	2.41 (.81)	1.80[NS]
Pilot Year 2 (2010 – 2011)	2.03 (.31)	2.81 (.81)	2.49[NS]

NS = no significant difference between 5th and 7th grade teachers

Table2.
Average Number of Discovery Education Social Studies Digital Assets Used by Teachers

Pilot/Academic Year	*Fifth- Grade Teachers Mean (SD)*	*Seventh-Grade Teachers Mean (SD)*	*F statistic*
Pilot Year 1 (2009 – 2010)			
• Total Digital Assets Used	976.25 (183.84)	2238.67 (1226.94)	3.71[NS]
• Social Studies Digital Assets Used	413.25 (205.32)	1371.83 (800.49)	5.30*
Pilot Year 2 (2010 – 2011)			
• Total Digital Assets Used	853.75 (443.99)	1746.33 (545.55)	7.36*
• Social Studies Digital Assets Used	361.75 (183.84)	1088.33 (445.37)	9.27*

*$p < .05$; NS = no significant difference between 5th and 7th grade teachers

Changes in Percent of Students Passing ISTEP+/Social Studies in Pilot and Non-Pilot Schools

In this section we analyze differences between the Discovery Education pilot schools and the non-pilot schools on background characteristics and ISTEP+ social studies achievement prior to the implementation of the pilot and on ISTEP+ social studies achievement one and two years

after implementation. If there are no differences between the pilot and non-pilot schools prior to the implementation, then we can have greater certainty that any changes in the ISTEP+ social studies performance of the pilot schools can be attributed to the Discovery Education social studies digital alignment strategy. Analysis of variance (ANOVA) techniques were used to investigate the differences in background characteristics and in the percentages of students passing the 2009, 2010, and 2011 ISTEP+ social studies performance within pilot and non-pilot schools. All analyses were completed separately for fifth-grade and seventh-grade schools.

Equivalence of Pilot and Non-Pilot Schools Prior to the Implementation of the Discovery Education Digital Alignment Strategy

As can be seen in Tables 3 and 4, prior to the implementation of the Discovery Education social studies digital alignment strategy, there were no statistically significant differences between pilot schools and non-pilot schools with regard to (a) the percent of students who received free and reduced priced meals, (b) percent that were from ethnic/racial minority backgrounds, or (c) the percent of students within the schools that passed the 2009 ISTEP+ in social studies.

Table 3.

Characteristics and ISTEP+ Social Studies Achievement Means of Fifth-Grade Schools Prior to Implementation

Characteristics of Schools	DE Pilot Schools N=4 Mean (SD)	Non-pilot Schools N=4 Mean (SD)	F statistic
Demographics			
• **Percent of students receiving free and reduced priced meals (FARMs)**	82.88 (10.00)	82.51 (15.73)	.00 [NS]
• **Percent of students from ethnic minority backgrounds**	55.14 (29.43)	43.43 (18.74)	.00 [NS]
Social Studies Achievement			
• **Percent of students passing the 2009 ISTEP+ in social studies**	59.50 (29.03)	51.75 (10.24)	.45 [NS]

NS = no significant difference between pilot and non-pilot schools

Table 4.
Characteristics and ISTEP+ Social Studies Achievement Means of Seventh-Grade Schools Prior to Implementation

Characteristics of Schools	DE Pilot Schools N=6 Mean (SD)	Non-pilot Schools N=6 Mean (SD	F statistic
Demographics			
• **Percent of students receiving free and reduced priced meals (FARMs)**	78.99 (7.49)	83.98 (6.96)	1.43 [NS]
• **Percent of students from ethnic minority backgrounds**	68.13 (17.07)	67.18 (32.77)	.00 [NS]
Social Studies Achievement			
• **Percent of students passing the 2009 ISTEP+ in social studies**	27.40 (11.06)	20.83 (10.68)	.99 [NS]

NS = no significant difference between pilot and non-pilot schools

### *Changes in the percent of fifth-grade students passing the ISTEP+ in social studies*

As indicated in Figure 1, the percent of fifth-grade students passing the ISTEP+ in social studies within the DE pilot schools increased in 2010 and 2011. However, those increases were not statistically different from the passing rate achieved prior to the implementation of the Discovery Education pilot. There were also no statistically significant differences between pilot schools and non-pilot schools in the percent of fifth-grade students that passed the ISTEP+ in social studies in 2010 and 2011.[6] (See Table 2 in Appendix for results of statistical tests.) The lack of significant change in ISTEP+ social studies performance at the fifth-grade DE pilot schools may be attributable to fifth-grade teachers' use of the Discovery Education digital content. As

indicated by our analyses of Discovery Education digital content usage data, only 42% of all digital media used by the 5th grade teachers was related to social studies. It is likely that fifth-grade teachers did not use the media-embedded pacing guides or the other media content available to them with enough frequency to impact student learning of social studies content.

Figure 1:
Percent of Fifth-Grade Students Passing ISTEP+/Social Studies
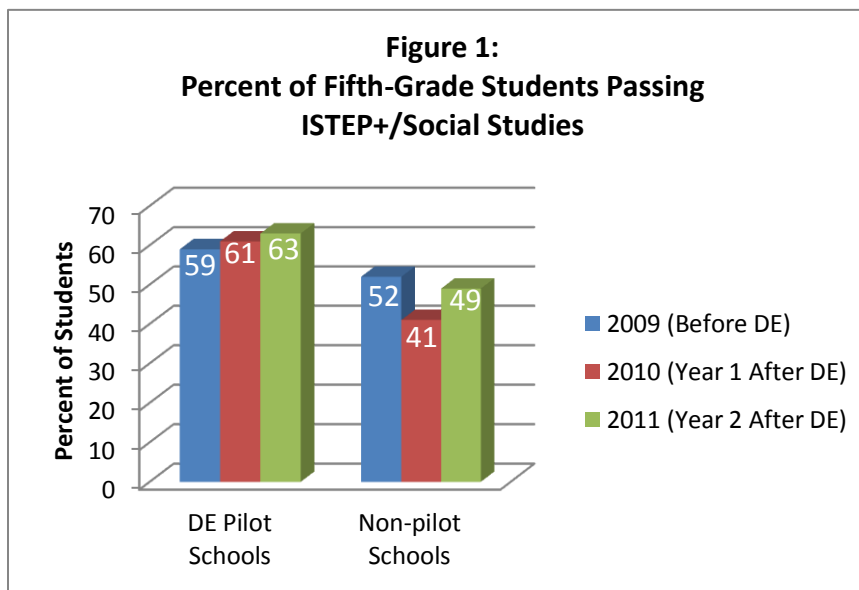
Changes in the percent of seventh-grade students passing the ISTEP+ in social studies

Among the seventh-grade schools participating in the Discovery Education pilot, the percent of students passing the ISTEP+ in social studies increased substantially and significantly in 2010 and 2011. Furthermore, although pilot schools and non-pilot schools had similar percentages of students that passed the ISTEP+ in social studies in 2009 and 2010, by the end of the 2011 academic year social studies achievement in pilot schools was significantly higher than in non-pilot schools. (See Table 3 in Appendix for results of statistical tests.) By 2011, the percent of seventh-grade students passing the test had increased by 29 percentage points in the pilot schools while non-pilot schools experienced only an increase of 8 percentage points. Because prior to the implementation of the pilot and non-pilot schools were statistically similar on a variety of variables that are known to impact students' academic performance, these findings provide strong evidence that, when properly used, the Discovery Education digital alignment strategy is effective in enhancing students' mastery of social studies.

Figure 2:
Percent of Seventh-Grade Students Passing ISTEP+/Social Studies
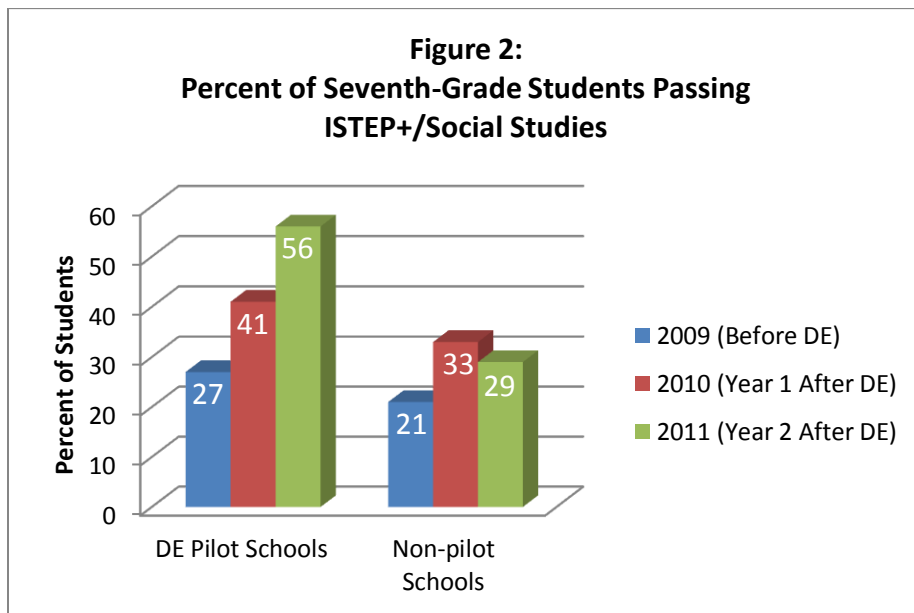
CONCLUSIONS

Overall, the results of this study indicate that the Discovery Education social studies digital alignment strategy is effective in increasing student learning of social studies. The percent of 7th grade students passing social studies in the pilot schools increased significantly each year of the pilot and exceeded the passing rates at comparable non-pilot schools by the end of the second year of the pilot.

The differences in the findings for fifth-grade schools as compared to seventh-grade pilot schools also provide clear lessons about what is required to ensure the effectiveness of such a strategy. The most notable conclusions that can be drawn from these findings include the following.

- The Discovery Education social studies digital alignment strategy is significantly more effective at producing higher student performance in social studies than traditional instructional approaches when it is implemented correctly. It's likely that the fifth-grade pilot schools in this study did not achieve significantly higher passing rates in social studies than comparable non-pilot schools because social studies related digital content was not used with sufficient frequency to impact student learning.

- While it is important for teachers to consistently use social studies related digital content within social studies instruction, it is also important that students receive media-embedded instruction more than twice per week. The percent of seventh-grade students passing the ISTEP+ in social studies did not surpass that of non-pilot schools until the second year of implementation when teachers used the Discovery Education services three times per week.

Findings from this study will inform the continued implementation of the Discovery Education social studies alignment strategy in Indianapolis Public Schools and will also serve as a model of effective strategies for using digital content to increase student achievement in social studies for other schools districts nationwide.

Table 1:
**Results of Repeated Measures ANOVA Investigating Change in Use of
Discovery Education Digital Content**

Source	Sum of Squares	df	Mean Square	F statistic	Sig.
Change in use from 20010 to 2011	.504	1	.504	19.83	.003
Change in use from 20010 to 2011 by grade	.009	1	.009	.36	.57
Error	.18	7	.025		

Table 2:
Percent of Fifth-Grade Students Passing ISTEP+ in Social Studies

Year of ISTEP+	DE Pilot Schools N=4 Mean (SD)	Non-pilot Schools N=4 Mean (SD)	F statistic
2009	59.50 (29.03)	51.75 (10.24)	0.25[NS]
2010	61.00 (20.61)	41.50 (5.69)	3.33[NS]
2011	62.64 (29.85)	48.85 (4.69)	0.83[NS]

NS = no significant difference between pilot and non-pilot schools

Table 3:
Percent of Seventh-Grade Students Passing ISTEP+ in Social Studies

Year of ISTEP+	DE Pilot Schools N=6 Mean (SD)	Non-pilot Schools N=6 Mean (SD)	F statistic
2009	27.40 (11.06)	20.83 (10.68)	0.99^{NS}
2010	41.00 (31.09)	32.67 (20.43)	0.30^{NS}
2011	56.51 (23.20)	29.38 (19.09)	4.89*

*$p < .05$; NS = no significant difference between pilot and non-pilot schools

ENDNOTES

[1] http://www.doe.in.gov/assessment/2011/

[2] Propensity score matching is a method for estimating causal effects in studies where selection into the treatment is non-random and based on background features of the participants. Propensity score matching uses an algorithm that identifies treatment and control cases that are closely matched on background characteristics that impact response to treatment. For information about propensity matching techniques see: Rosenbaum, PR & Rubin, DB (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, 41-55.; Rosenbaum, PR & Rubin, DB (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*, 39, 33-38.

[3] What Works Clearinghouse (2010). *What Works Clearinghouse: Procedures and Standards Handbook (Version 2.1)*. Washington, DC: US Department of Education, Institute of Education Sciences.

[4] Information regarding the racial/ethnic composition of schools and the percent of students within schools participating in the federal Free and Reduced Meals (FARMs) program was extracted from the US Department of Education's Common Core of Data, Public Elementary/Secondary School Universe Survey Data for 2009-2010 (http://nces.ed.gov/ccd/pubschuniv.asp), which contains information about the characteristics of all schools in the country, including those in the Indianapolis Public School district.

[5] Lawless, KA & Pellegrino, JW (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77 (4), pp. 575-614.

[6] A quick glance at the different passing rates for pilot and non-pilot schools may lead observers to believe that social studies performance at pilot schools is consistently higher than in non-pilot schools. However, because the schools in the pilot were selected to represent the variability that exists within the Indianapolis Public Schools, there is a great deal of statistical variability in the performance data. This variability within pilot schools accounts for the lack of statistical significance even when the difference in passing rates between pilot and non-pilot schools appear large. See Table 2 in the Appendix for documentation of the greater variability within pilot than non-pilot schools.