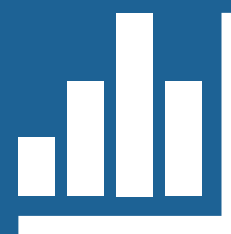


## STUDENT PERFORMANCE ON LEARNING ASSESSMENTS

*This note was written for NCEA (United States)  
and is reproduced here for international readers*

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April 2019



Analytics series

### KEY MESSAGES:

- Students in Catholic schools perform better on national assessments than students in public schools. This is good news for Catholic schools, especially given lower risks of performance below basic levels.
- However, this does not imply that Catholic schools perform better than public schools since gaps may be due in part to differences in student characteristics. In addition, better performance versus students in public schools does not imply a strong performance. Many students in Catholic schools still perform below proficiency levels, and students in the United States often lag behind those in other countries.

### Introduction

According to the National Catholic Education Association (NCEA), Catholic schools served 1.8 million children in the 2018-19 school year. As noted in the first note in this series, enrollment has been declining for 50 years. This is the bad news for Catholic schools. The good news is that student performance on national learning assessments remains high in Catholic schools in comparison to public schools.

As a second introductory note in this series to provide context on Catholic education in the United States before zooming in on particular topics, this note reviews the comparative performance of students in Catholic and public schools. The analysis is based on data from 2000 to 2015 collected by the National Assessment of Educational Progress. The data suggest the possibility of what the literature has called a Catholic school advantage, especially for (often disadvantaged) students performing towards the lower end of the distribution. At the same time, even in Catholic schools, there is room for improvement.

### Box 1: Knowledge Notes

**What is the mission of the Global Catholic Education website?** The site informs and connects Catholic educators globally. It provides them with data, analysis, opportunities to learn, and other resources to help them fulfill their mission with a focus on the preferential option for the poor.

**Which topics are covered in the Knowledge Notes Series?** The series explores achievements and challenges for Catholic schools globally, including in terms of enrollment, reach to the poor, academic performance, parental priorities, costs and affordability, and religious education. Interesting innovations are also featured.

**What is the focus of this note?** Two questions are asked: How do students in Catholic schools perform on national assessments in comparison to students in public schools, and which students may benefit the most from Catholic schools? The analysis is based in large part on national assessment data but international comparisons are also provided.

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**Average Performance on National Assessments**

There is a substantial literature in the United States on the performance of students in Catholic schools in comparison to the performance of students in other schools. Broadly speaking, Catholic schools are perceived as doing comparatively well, at least in comparison to public schools, but the extent to which this is due to the performance of the schools themselves or to differences in the characteristics of the students who enroll in Catholic versus public schools remains debated (see Box 2).

Measures of student performance on standardized tests are available from the National Assessment of Educational Progress (NAEP). The latest results are for 2015. Key statistics from 2000 to 2015 are provided for public and Catholic schools in Table 1 for proficiency in mathematics. Unfortunately, data for other private schools or for the overall universe of private schools including Catholic schools are not available for recent years. Older data for the 1990s are also available on the NAEP website but findings are similar, so the focus is on data since 2000.

The first estimate in Table 2 indicates that the average NAEP math score for students in 4<sup>th</sup> grade was 240 on a scale of 0 to 500. Since 2007 few gains have been achieved, but performance was lower before in both Catholic and public schools. Gaps between students in Catholic and public schools have decreased over time, as visualized in Figure 1, but students in Catholic schools continue to do (slightly) better than those in public schools.

**Table 1: Average Student Performance in Math in Public and Catholic Schools, NAEP 2000-15**

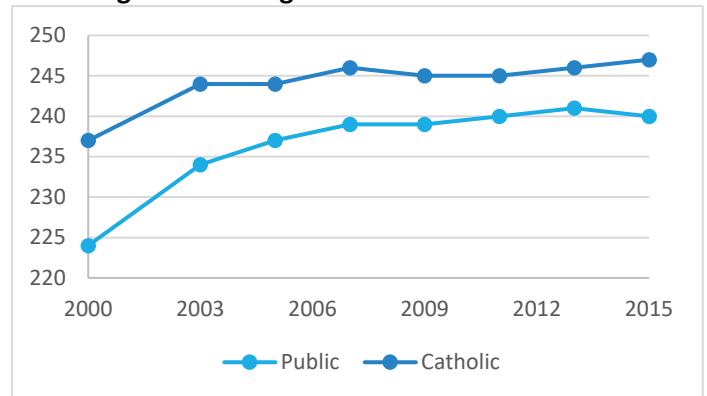
Year	Mathematics, 4 <sup>th</sup> Grade			
	Public	Catholic	Absolute Difference	Percentage Difference
2015	240	247	7	2.9%
2013	241	246	5	2.1%
2011	240	245	5	2.1%
2009	239	245	6	2.5%
2007	239	246	7	2.9%
2005	237	244	7	3.0%
2003	234	244	10	4.3%
2000	224	237	13	5.8%
Year	Mathematics, 8 <sup>th</sup> Grade			
	Public	Catholic	Absolute Difference	Percentage Difference
2015	281	293	12	4.3%
2013	284	295	11	3.9%
2011	283	295	12	4.2%
2009	282	297	15	5.3%
2007	280	292	12	4.3%
2005	278	290	12	4.3%
2003	276	289	13	4.7%
2000	272	284	12	4.4%

Source: NAEP data.

Table 1 also provides estimates of student performance for 8<sup>th</sup> graders, with visualization provided in Figure 2. In 8<sup>th</sup> grade, gaps are a bit larger between students in Catholic and public schools, and they have remained stable over time. Other data are available from NAEP for performance in the sciences and for 12<sup>th</sup> grade students, but Table 1 is sufficient to show that students in Catholic schools on average tend to perform slightly better on mathematics than students in public schools.

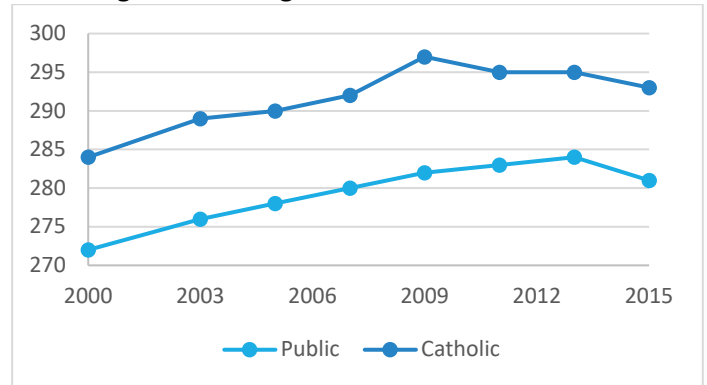
The average performance of students in Catholic schools on the NAEP is higher than for students in public schools. Gaps in performance between students in Catholic and public schools are larger for reading than for mathematics.

**Figure 1: Average Math Score for 4<sup>th</sup> Grade**



Source: NAEP data.

**Figure 2: Average Math Score for 8<sup>th</sup> Grade**



Source: NAEP data.

A similar finding emerges in Table 2 and Figures 3 and 4 for reading ability. Students in Catholic schools tend to perform better on average than students in public schools, and the gaps between students from both types of schools tend to be larger in both absolute and proportional terms. These gaps have not changed much over the 15 year period for which estimates are reported in this note.

These findings for both mathematics and reading are encouraging for Catholic schools. The differences in performance reported in Tables 1 and 2 are often statistically significant. Yet as noted in Box 2, these differences in student performance do not necessarily imply that Catholic schools themselves perform better than public schools. They only show that students in Catholic schools perform better than those in public schools.

Differences in student performance do not imply that Catholic schools perform better than public schools. Gaps may be due in part to differences in student characteristics.

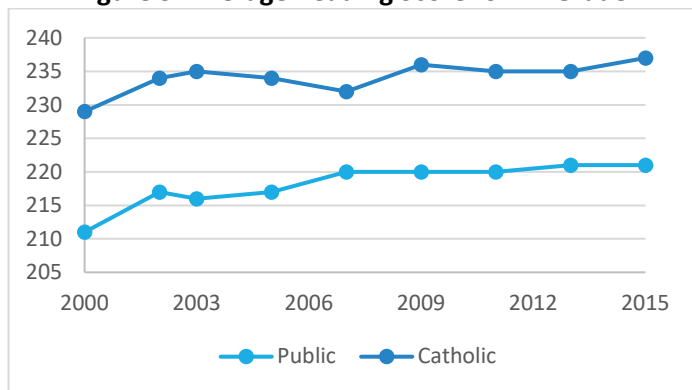
**Table 2: Average Student Performance for Reading in Public and Catholic Schools, NAEP 2000-15**

Year	Reading, 4 <sup>th</sup> Grade			
	Public	Catholic	Absolute Difference	Percentage Difference
2015	221	237	16	7.2%
2013	221	235	14	6.3%
2011	220	235	15	6.8%
2009	220	236	16	7.3%
2007	220	232	12	5.5%
2005	217	234	17	7.8%
2003	216	235	19	8.8%
2000	211	229	18	8.5%
Year	Reading, 8 <sup>th</sup> Grade			
	Public	Catholic	Absolute Difference	Percentage Difference
2015	264	284	20	7.6%
2013	266	286	20	7.5%
2011	264	283	19	7.2%
2009	262	281	19	7.3%
2007	261	282	21	8.0%
2005	260	280	20	7.7%
2003	261	281	20	7.7%
2002	263*	281*	18*	6.8%*

Source: NAEP data.

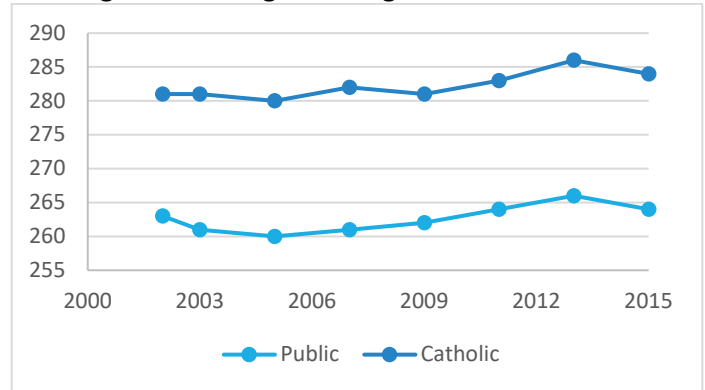
Note: For Reading in 8<sup>th</sup> grade, the last data point is 2000.

**Figure 3: Average Reading Score for 4<sup>th</sup> Grade**



Source: NAEP data.

**Figure 4: Average Reading Score for 8<sup>th</sup> Grade**



Source: NAEP data.

**Box 2: Is There a Catholic Advantage?**

Higher performance on the NAEP and other standardized tests for students in Catholic versus public schools does not imply that Catholic schools perform better than public schools. This is because differences in performance could be due to differences in the characteristics of the students enrolling in the two types of schools as opposed to differences in the performance of the schools themselves.

At the same time, there is a literature suggesting the possibility of a Catholic school advantage, starting with early work by Coleman et al. (1982), Greely (1982), Coleman and Hoffa (1987), and Bryk et al. (1993). These authors advanced the hypothesis of a Catholic school effect leading to good performance thanks in part to an emphasis in the schools and the broader Catholic community on both excellence and social justice. This emphasis may have led Catholic schools to ensure better success especially among low-income and minority students enrolled in the schools. Subsequent studies among others by Evans and Schwab (1995), Sander and Krautman (1995), Sander (1996), Neal (1997), Altonji et al. (2005), Carbonaro (2006), Hallinan and Kubitschek (2013), and Freeman and Berends (2016) also suggest the possibility of a Catholic school advantage.

Yet there is no unanimity of this topic as there are also some studies not finding evidence of a Catholic school advantage after controlling for the characteristics of the students who enroll in Catholic versus public schools and the characteristics of their families (see for example Jepsen, 2003, and Elder and Jepsen, 2014). The debate on the existence of a Catholic school advantage and the magnitude of that advantage is therefore not fully resolved.

## Distribution of Performance on National Assessments

Table 4 and Figures 5 to 8 provide additional information by considering the share of students falling into various categories of proficiency. To explain the estimates, consider the estimates for public schools in 2015. One in five students (19 percent) in 4<sup>th</sup> grade performed below the basic level in mathematics, so that 81 percent performed above that level. The next two statistics show the shares of students performing above proficiency (39 percent) and at an advanced level (7 percent). Statistics are again provided for 4<sup>th</sup> and 8<sup>th</sup> grade comparing public and Catholic schools. In Figures 5 to 8, estimates are shown for 2015 with the shares of students at four levels: below basic, at basic and below proficiency, at proficiency and below advanced, and at advanced, so that the four shares sum to 100 percent.

Table 4 suggests that higher average scores for students in Catholic schools come in part from a smaller share of students performing below basic level. For example, for mathematics in 4<sup>th</sup> grade, in comparison to 19 percent of students performing below basic level in public schools in 2015, the proportion is 10 percent in Catholic schools. This leads to a difference in the shares of student below the basic level of nine points. For mathematics in 8<sup>th</sup> grade, the gap between Catholic and public schools in the shares of students performing below the basic level is larger at 15 points. For reading in 4<sup>th</sup> grade, the gap is at 12 points. Finally, the largest gap is observed for reading in 8<sup>th</sup> grade where nine percent of students perform below the basic level in Catholic schools versus 25 percent for public schools, yielding a gap of 16 points.

The higher average scores for students in Catholic schools come in part from a smaller share of students performing below basic level. Catholic schools may be especially beneficial for students who might otherwise perform poorly.

In general, the shares of students performing at or above the basic level but below proficiency are not too different between Catholic and public schools, but Catholic schools have more students performing above the proficiency level. The statistics suggest that enrollment in Catholic schools may be especially beneficial for students who would otherwise have performed poorly. This finding cannot be ascertained simply on the basis of the statistics provided in this note, but it is often mentioned in the literature based on more detailed research that accounts for the characteristics of the children enrolled in various types of schools.

The estimates in Tables 2 to 4 suggest that students in Catholic schools perform relatively well in comparison to students in public schools. This is good news for Catholic schools, especially given their stated mission to serve in priority students from disadvantaged background that may do less well on learning assessments. Yet again the basic statistics provided in this note do not necessarily imply that

Catholic schools perform better. For example, the share of students from disadvantaged backgrounds enrolled in Catholic schools has decreased over time as documented in the first note in this series, which may contribute to better average student performance. Furthermore, the estimates are not indicative of high performance either, whether students are enrolled in Catholic or public schools.

The distribution of student performance in Table 4 suggests that less than half of the students in public schools perform at the proficiency level on the NAEP tests for mathematics and reading. In Catholic schools in 2015, the proportion of students performing at or above the proficiency level is 48 percent for mathematics in 4<sup>th</sup> grade, 44 percent for mathematics in 8<sup>th</sup> grade, 52 percent for reading in 4<sup>th</sup> grade, and 55 percent for reading in 8<sup>th</sup> grade. In other words, only about half of the students perform at the proficiency level. There is thus room for improvement in Catholic as well as in public schools. The factors leading to low performance for many students are complex, and not necessarily related to the performance of the schools themselves since student and family characteristics often have a larger impact on student performance than school characteristics. Still, it remains that average performance levels are generally not high across the board.

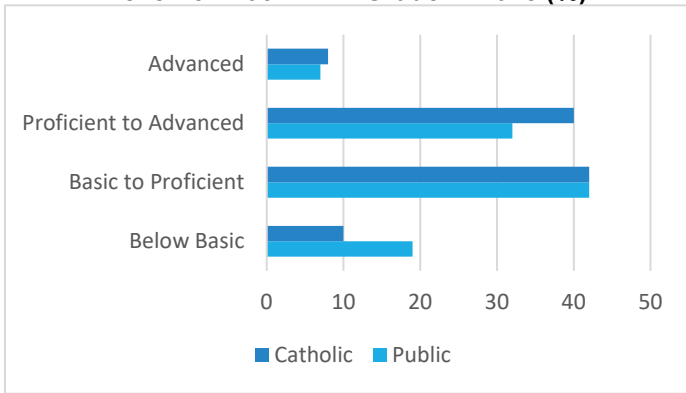
A better performance on student assessments for students in Catholic schools in comparison to students in public schools does not imply great performance. Only half of students in Catholic schools perform at proficiency levels.

While space is lacking in this note to explore other dimensions of student performance in detail (see Box 3), it should be noted that students in Catholic schools also tend to perform well on other metrics. For example, graduation rates from high school tend to be higher in Catholic than in public schools, and the proportion of students who go to college is also larger in Catholic than in public schools.

### Box 3: Beyond Traditional Learning Assessments

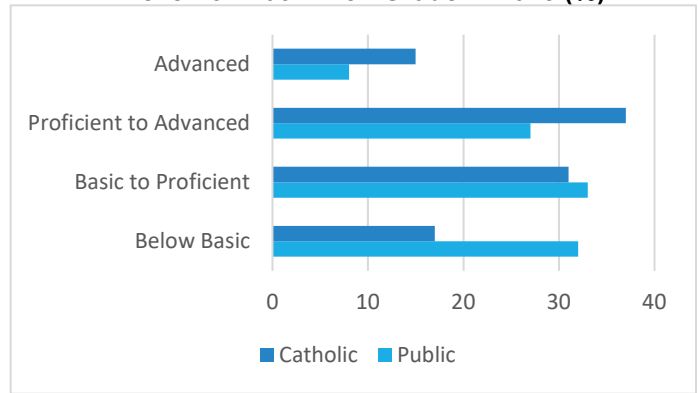
The focus of this note on student performance on the NAEP is narrow given the aim of Catholic schools to educate towards fraternal humanism. Even when keeping a focus on whether students are equipped to be productive as adults in labor markets, there is much more to education than the acquisition of cognitive skills as measured in traditional learning assessments. The changing nature of work has implications for the skills that workers will need to acquire in school and beyond to become team-oriented problem-solvers who can adapt to new circumstances. High-order cognitive and socio-emotional skills will increasingly be valued. Character education and grit must also be nurtured, and a case can be made that schools should also promote the acquisition of sound values. Other notes in this series will discuss questions related to the particular identity and mission of Catholic schools.

**Figure 5: Share of Students by Proficiency Level for Math in 4<sup>th</sup> Grade in 2015 (%)**



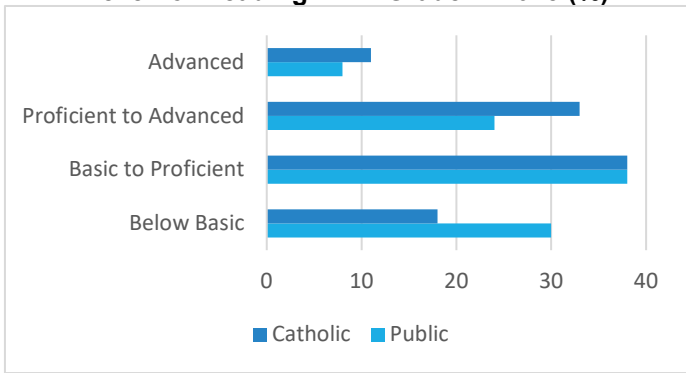
Source: NAEP data.

**Figure 6: Share of Students by Proficiency Level for Math in 8<sup>th</sup> Grade in 2015 (%)**



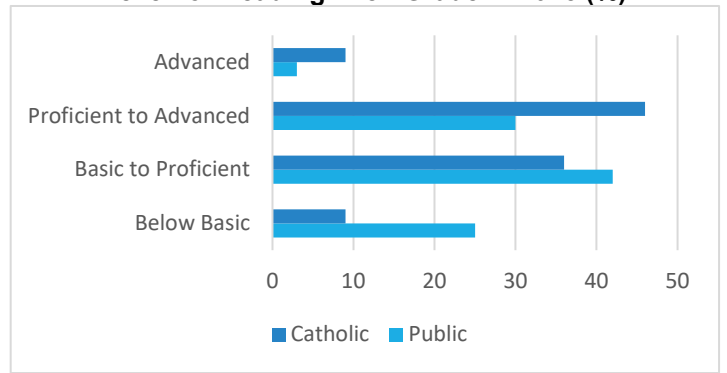
Source: NAEP data.

**Figure 7: Share of Students by Proficiency Level for Reading in 4<sup>th</sup> Grade in 2015 (%)**



Source: NAEP data.

**Figure 8: Share of Students by Proficiency Level for Reading in 8<sup>th</sup> Grade in 2015 (%)**



Source: NAEP data.

**Table 4: Distribution of Student Performance in Mathematics and Reading, 2000-2015**

Year	Public				Catholic				Public				Catholic			
	<B	≥B	≥P	A	<B	≥B	≥P	A	<B	≥B	≥P	A	<B	≥B	≥P	A
	<b>Mathematics, 4<sup>th</sup> Grade</b>								<b>Mathematics, 8<sup>th</sup> Grade</b>							
2015	19	81	39	7	10	90	48	8	30	70	32	8	18	82	44	11
2013	18	82	41	8	12	88	48	8	27	73	34	8	16	84	46	12
2011	18	82	40	6	12	88	46	6	28	72	34	8	15	85	46	12
2009	19	81	38	6	12	88	46	7	29	71	33	7	13	87	47	13
2007	19	81	39	5	10	90	48	6	30	70	31	7	17	83	42	9
2005	21	79	35	5	12	88	43	5	32	68	28	6	19	81	40	8
2003	24	76	31	4	12	88	43	5	33	67	27	5	19	81	39	8
2000	36	64	22	2	19	81	33	3	38	62	25	5	23	77	32	5
	<b>Reading, 4<sup>th</sup> Grade</b>								<b>Reading, 8<sup>th</sup> Grade</b>							
2015	32	68	35	8	17	83	52	15	25	75	33	3	9	91	55	9
2013	33	67	34	8	18	82	49	13	23	77	34	4	8	92	59	10
2011	34	66	32	7	18	82	50	14	25	75	32	3	9	91	55	8
2009	34	66	32	7	18	82	50	15	26	74	30	2	9	91	51	6
2007	34	66	32	7	20	80	44	11	27	73	29	2	9	91	52	8
2005	38	62	30	7	20	80	46	14	29	71	29	3	10	90	49	7
2003	38	62	30	7	19	81	48	14	28	72	30	3	10	90	51	7
2002	38	62	30	6	20	80	47	13	26	74	31	2	10	90	51	6
2000	43	57	28	6	25	75	41	10	-	-	-	-	-	-	-	-

Source: NAEP data.

Notes: <B = Below basic; ≥B = At or above basic; ≥P = At or above proficient; A = Advanced. For Reading in 8<sup>th</sup> grade, the last data point in the Table is for 2002.



## International Comparisons of Learning Performance

The fact that there is room for improvement is also clear from international comparisons. On average, students in the United States perform less well than students in many other developed countries. This emerges clearly in data from international student assessments such as the Programme for International Student Assessment (PISA) which measures reading ability and performance in mathematics and science among 15-year-olds.

The latest PISA data are for 2015 (estimates for 2018 will be released in 2020). That year, a total of 71 countries participated in the assessment. The United States ranked 38<sup>th</sup> in mathematics and 24<sup>th</sup> in reading and science, which is not high. When compared to other countries that are members of the Organization for Economic Cooperation and Development, the United States stood towards the lower tail of the distribution.

Therefore a slightly better performance for students in Catholic schools in comparison to those in public schools in the United States does not necessarily place students in Catholic schools at a high level by international standards. Similar findings for the performance of students in the United States are found when considering other international assessments such as PIRLS (Progress in International Reading Literacy Study) or TIMSS (Trends in International Mathematics and Science Study).

Among 71 countries that participated in the 2015 PISA assessment, the United States ranked 38<sup>th</sup> in mathematics and 24<sup>th</sup> in reading and science in 2015. The country also ranks 32<sup>nd</sup> in the world in terms of the learning-adjusted years of schooling that children are expected to complete.

Another way to provide international perspective is to rely on harmonized learning outcomes data recently released by the World Bank. Data have been compiled for 157 countries to compare their performance according to two metrics: the number of years of schooling that children are expected to complete, and a learning-adjusted measure that accounts for learning performance.

The learning-adjusted estimates incorporate findings from PISA and other international student assessments to account for the fact that while some students may be enrolled in a particular grade, they may not perform at the level of that grade on international assessments. This leads learning-adjusted years of schooling to be lower than the expected years of schooling since some students perform below expectations for their grade.

The country-level estimates for the top 40 countries ranked according to the learning-adjusted metrics are provided in Table 5. With 13.3 years of expected schooling, but only 11.1 years under the learning-adjusted measure, the

United States ranks 32<sup>nd</sup>, which is below a number of other countries that have lower levels of economic development.

**Table 5: Learning-Adjusted Years of Schooling**

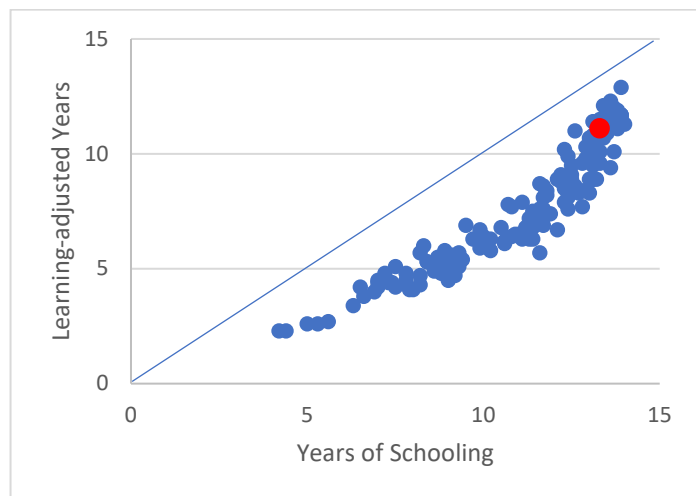
	Country	Expected Years of Schooling	Test Score	Learning -adjusted Years
1	Singapore	13.9	581	12.9
2	Japan	13.6	563	12.3
3	Korea	13.6	563	12.2
4	Hong Kong	13.4	562	12.1
5	Finland	13.7	548	12.0
6	Russia	13.8	538	11.9
7	Ireland	13.7	538	11.8
8	Austria	13.9	525	11.7
9	Canada	13.7	537	11.7
10	Germany	13.9	528	11.7
11	Netherlands	13.8	530	11.7
12	Sweden	13.9	525	11.7
13	Australia	13.8	524	11.6
14	Czech Republic	13.9	522	11.6
15	Slovenia	13.6	532	11.6
16	Kazakhstan	13.3	537	11.5
17	Portugal	13.8	520	11.5
18	United Kingdom	13.9	517	11.5
19	Denmark	13.4	531	11.4
20	Estonia	13.1	542	11.4
21	France	14.0	506	11.3
22	Latvia	13.3	530	11.3
23	New Zealand	13.6	517	11.3
24	Poland	13.2	537	11.3
25	Italy	13.6	514	11.2
26	Lithuania	13.6	514	11.2
27	Norway	13.7	512	11.2
28	Belgium	13.4	519	11.1
29	Israel	13.8	503	11.1
30	Serbia	13.4	521	11.1
31	Switzerland	13.3	524	11.1
32	United States	13.3	523	11.1
33	Macao	12.6	545	11.0
34	Cyprus	13.5	502	10.9
35	Spain	13.1	514	10.8
36	Croatia	13.3	505	10.7
37	Hungary	13	516	10.7
38	Iceland	13.4	497	10.7
39	Slovak Republic	13	500	10.4
40	Bulgaria	12.9	498	10.3

Source: World Bank data.

Figure 9 provides a scatter plot for 157 countries comparing their performance according to two metrics: the number of years of schooling that children are expected to complete is on the horizontal axis, and the learning-adjusted measure on the vertical axis that accounts for learning performance. The distance between the observations on the scatter plot and the diagonal represents the loss in learning-adjusted years of schooling due to poor learning in school leading some students to

perform below expectations for their grade. The United States is visualized through the red dot in the Figure. The country does better than most other countries, but this is not surprising given that the level of economic development of the United States is much higher than that of most other countries. More concerning is the fact that as already noted in table 5, many high income and even some upper middle-income countries perform better on the harmonized measure than the United States.

**Figure 9: International Comparison of Learning-Adjusted Years of Schooling**



Source: World Bank data.

These harmonized measures are not perfect, but they do suggest that important gains can and should be achieved for American students, whether they are in public or Catholic schools. As already noted, even good performance in Catholic schools in comparison to public schools does not necessarily imply great performance by international standards, especially in comparison to other countries with similar levels of economic development.

## Conclusion

Together with the first note in this series, the objective of this note was to provide broad context on Catholic education in the United States. While the first note in the series considered long-term trends in enrollment, this note focused on achievement relying on data from the NAEP as well as international comparisons.

Two findings stand out. First, students in Catholic schools on average perform better than students in public schools on learning assessments such as the NAEP. Although this has not been discussed here in details, Catholic schools also tend to have higher graduation rates in secondary schools and a larger share of students going to college than public schools. Some of the differences between students

in Catholic and public schools are far from negligible, as is the case for the reading assessment of the NAEP.

Second, the higher average scores for students in Catholic schools come in part from a smaller share of students performing below basic level. Catholic schools may thus be especially beneficial for students who might otherwise perform poorly. This is good news for the mission of Catholic schools since they often aim to serve in priority students from disadvantaged backgrounds who tend to do less well in school (even if the share of the students from disadvantaged backgrounds that attend the schools has decreased over time as noted in the first note in this series).

Yet the better performance of students in Catholic schools does not necessarily imply that Catholic schools themselves perform better than public schools given the issue of self-selection. It is likely that part of the higher performance of at least some students in Catholic schools in comparison to public schools is due to differences in the characteristics of the students and their families, rather than to differences in the performance of the schools themselves.

In addition, even if there is a Catholic school advantage leading to better performance for students in Catholic schools in comparison to the performance that would have been observed for those students in public schools, this does not imply that students in Catholic schools in the United States are doing very well. First, many students do not achieve proficiency levels as defined by the NAEP. In addition, the American education system as a whole is performing relatively poorly on cross-country measures of learning outcomes such as the Programme for International Student Assessment. The same finding is observed when relying on the expected number of learning-adjusted years of schooling that children are expected to complete. The data thus suggest that there is room for improvement in Catholic and other schools beyond the important achievements recorded to-date.

As a final consideration, as mentioned in Box 3, it should be noted that the emphasis in this note on student performance on traditional learning assessments does not imply that other aspects of the learning experience of students in Catholic schools are not valued. Subsequent notes in this series will discuss parental priorities for what their children should learn in school, for example in terms of the emphasis that could be placed by schools not only on cognitive skills, but also on socio-emotional skills and values as well as religious education. Future notes in this series will also consider why some parents decide to enroll their children in Catholic schools, and the factors that may contribute to comparatively good performance by students in Catholic schools on various metrics.

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