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Education in the U.S. and the Netherlands: An Equity Comparison and a Few Big Questions[1]

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ABSTRACT

Using an equity perspective, this article compares the education systems of the United States and the Netherlands. Existing data examining student demographics, the organizational structures, curricula, funding, and student outcomes are examined. The Netherlands appears to be getting a "bigger bang for their buck." We make the case that since the 10th Amendment to the Constitution makes U.S. education a state function, 50 states can have significant variance in their instructional standards, funding, and outcomes. At the secondary level, these differences may partially explain U.S. students' lagging achievement as measured by international tests. Fundamental questions about the U.S. education system are posed for a broader discussion.

INTRODUCTION

In fall 2013, two authors were invited to speak at the University of Amsterdam, comparing the U.S. and the Netherlands education systems and their respective outcomes. While the two countries have cultural similarities—both nations were founded on a western European heritage—they differ in how each

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1. This paper was presented at the National Education Finance Academy Conference in St. Louis, MO, on March 26, 2015.

country provides education to their youth and the resulting educational and social outcomes. These dissimilarities have contemporary and far-reaching implications as we prepare tomorrow's workforce for our nation's economic and political future.

To wit, in February 2015, the Educational Testing Service (ETS) released *America's Skills Challenge: Millennials and the Future* (Goodman, Sands, and Coley 2015). The study compares persons born after 1980 (ages 16–34 during the study) in the 22 Organization for Economic Cooperation and Development (OECD) countries that took part in the 2012 Program for the International Assessment of Adult Competencies (PIAAC). The test measures career-oriented literacy and numeracy skills and problem solving in technology-rich environments. On this assessment, U.S. millennials scored fifth from last in literacy, last in numeracy, and second from last in problem solving in technology-rich environments. In contrast, the Netherlands scored third from the top in literacy and fourth from the top in numeracy and problem solving in technology-rich environments.

Disaggregated PIAAC data offer sobering implications for the U.S. workforce. Four reasons explain why. First, both higher and lower performing American millennials scored at the bottom of the test compared with their peers in other countries. For example, low scoring U.S. millennials (at the 10th percentile) ranked last (tied with Italy and England/Northern Ireland). Top scoring U.S. millennials (those at the 90th percentile) scored lower than any other country except for Spain. Second, the achievement gap between the U.S. bottom 10th and the top 90th percentile scores was the greatest of any other country tested – 139 points as compared with an OECD average gap of 122 points – highlighting the wide proficiency disparities across American millennials. Third, economists argue that ever-widening skill gaps in the U.S. check economic growth and propagate wage gaps (Autor, Katz, and Kearney 2008). Fourth, Christine Lagarde, Managing Director of the International Monetary Fund, warns of the consequences of a growing economic and educational disparity on our democratic social fabric. She states,

> "The 85 richest people in the world, who could fit into a single London double-decker, control as much wealth as the poorest half of the global population—that is 3.5 billion people….
>
> "Fundamentally, excessive inequality makes capitalism less inclusive. It hinders people from participating fully and developing their potential.
>
> Disparity also brings division. The principles of solidarity and reciprocity that bind societies together are more likely to erode in excessively unequal societies. History also teaches us that democracy begins to fray at the edges once political battles separate the haves against the have-nots" (Lagarde 2014).

The ETS report concludes, "Moreover, if there is inequality in the investment and quality of educational resources for different racial/ethnic and socioeconomic groups within the U.S., then inequalities in skills, economic opportunity, income, and wealth will continue to grow over time" (Autor, Katz, and Kearney 2008, p. 41). Our national well being depends on educating every child to high levels of knowledge and performance if we are to keep our democracy's social fabric from "fraying at the edges." An equity comparison between the U.S. and the Netherlands education programs may reveal some insights, raise questions, and serve as the basis for policy discussions.

METHODOLOGY

Existing data and reports were used in this equity comparison study. Statistics came from ETS, OECD, the Digest of Education Statistics, the U.S. Department of Education, and the Netherlands' National Ministry of Education, Culture and Science. Test score data came from the 2012 Program for the International Assessment of Adult Competencies (PIAAC), the Progress in International Reading Literacy Study (PIRLS), Trends in International Mathematics and Science Study (TIMSS), and the Programme for International Student Assessment (PISA).

STUDENT DEMOGRAPHICS COMPARISON

The Netherlands is a country the size of Maryland with 3.5 million students in 8,700 primary and secondary schools. The U.S. has approximately 50 million students in 99,000 schools within 13,500 school districts (Snyder and Dillow 2013, p. 144). Ethnicity for U.S. and Dutch students are found in Table 1.

While geographically smaller than the U.S., the Netherlands has a more homogenous student population than does the U.S. Literacy rates are roughly identical for the two countries. The U.S., however, has more than twice the child poverty rate at 21.2% than does the Netherlands at 9.9% (OECD 2015, Table CO2.2A). In education, poverty is the risk factor that exacerbates all other risk factors.

OVERVIEW OF SOCIETY AND EDUCATION IN THE NETHERLANDS

To make sense of the two education systems, it is necessary to understand the Dutch society and education system. Characterizing a people is difficult; generalities mask a range of uniquenesses. On the one hand, the Dutch have

Table 1. Ethnicities, Literacy Rates, and Child Rates of Dutch and U.S. School-aged Children

The Netherlands	**The United States**
Dutch – 80.7%	White – 49.8%
European – 5%	Hispanic – 25.8%
Indonesian – 2.4%	African American – 15.4%
Turkish – 2.2%	Asian/Pacific Islander – 5.2%
Surinamese – 2%	Native American/Alaska – 1.1%
Moroccan – 2%	Two or more races – 2.8%
Caribbean – 0.8%	
Other – 4.8%	
Literacy Rate – 99%	Literacy Rate – 99%
Child Poverty Rate – 9.9%	Child Poverty Rate – 21.2%

Source: For Dutch ethnicities and literacy rates – *The World Factbook* retrieved from: *https://www.cia.gov/library/publications/the-world-factbook/*

For U.S. ethnicities and literacy rates – *Digest of Education Statistics 2013.* For child poverty rates in the U.S. and the Netherlands – OECD Family Database, Table CO2.2.A. Retrieved from *www.oecd.org/social/family/database.*

been described as having collectivist perspective dating back to the realization that their lowlands could only be reclaimed by working closely together, living by a "we all live in the same boat" approach (Center on International Education Benchmarking 2015). On the other hand, the Dutch have long been a "pillarized" or separated society divided among three groups: Catholics, Protestants, and secularists. Each had its own schools, newspapers, hospitals, and social groups (Ladd and Fiske 2011).

The Netherlands has a long history of parental choice in selecting the school their children attended. The Constitution of 1848 allowed groups of parents to request the state to establish a school for their children at state expense. A 1917 Constitutional change required the state to fund religious (Catholic and Protestant) schools at the same level as public schools with school personnel. This has led to a commitment to a Dutch concept of "freedom of education" to start new schools and the right for parents to select their child's school and have this aspiration government funded. As of 2006, funding follows the students to the schools their parents elect to have their children attend. What is more, disadvantaged students bring additional weighting factors above the base-funding factor directly to the schools to address equity issues (Ladd and Fiske 2011).

ORGANIZATIONAL COMPARISON

Like many European countries, the Netherlands has a nationalized system of education administered by the National Ministry of Education, Culture and Science. The Ministry decides the length of courses, compulsory and optional subjects to be taught, lesson frequency and length, class sizes, compulsory attendance ages, and negotiates salaries for education employees (Center on International Benchmarking 2015).

In the United States, on December 15, 1791, representatives reached a compromise "state's rights" amendment so the U.S. Constitution could be ratified. This 10th Amendment ultimately determined that each state controlled the structure of its education system. At the time of its passage in the late 18th century, most Americans did not leave their own village or state, much less the country, in order to secure gainful employment to support themselves and their families. The 10th Amendment contained unforeseen but serious implications for our education system and our nation's future economy: 50 separate (plus the District of Columbia and territories) departments of education, each of which sets policies on the age when children are required to begin and end formal schooling, course lengths, compulsory and optional subjects to be taught, lesson frequency and length, number of days in the school calendar, and class sizes. Moreover, union and right to work states—where unions negotiate or state legislatures set salaries with local school board adoptions—also vary from state to state. And, while each state controls its fundamental system of education, education is administered at the local level.

Pre-School Education

In 1985, the Netherlands integrated preschool with primary schools, using a developmentally appropriate curriculum (Center on International Education Benchmarking 2015). While education is compulsory for Dutch children between the ages of 5–18 (or until they obtain a diploma), 83% of three-year olds and 100% of four and five-year olds are enrolled in formal schooling (OECD 2014).

In the United States, each state sets its own requirements for compulsory attendance. Only 63.7% of U.S. three, four and five year-olds are enrolled in any type of preschool programs (Snyder and Dillow 2013, Table 56, p. 97). Moreover, the quality of U.S. pre-school childcare programs varies greatly, from unlicensed programs to those that are regulated by government authorities (Boocock 1995). The variance in program quality, however, makes comparisons between the two countries difficult beyond saying Dutch schooling starts at a younger age and a greater percentage of children attend pre-school than in the U.S.

Age and Grade Comparisons

Figure 1 shows the Netherlands' schooling consists of primary (ages 4–12) and secondary (ages 12–18) education or until the basic qualification (diploma) is achieved. At the end of primary education, a final test is administered to students. Most schools use the CITO examination (named after Cito, the Netherlands assessment company that developed the test). Results basically place students into one of three secondary education "tracks." Two tracks, the HAVO and VWO, lead to college or university education, respectively.

Thirty-eight percent of students receive admittance to these two higher education paths. HAVO, which lasts from ages 12–17, is a college preparation program called the University of Professional Education track. VWO, which lasts from ages 12–18, is a research university preparation program. The third track, VMBO, which lasts from ages 12–16, is a vocational preparation program with

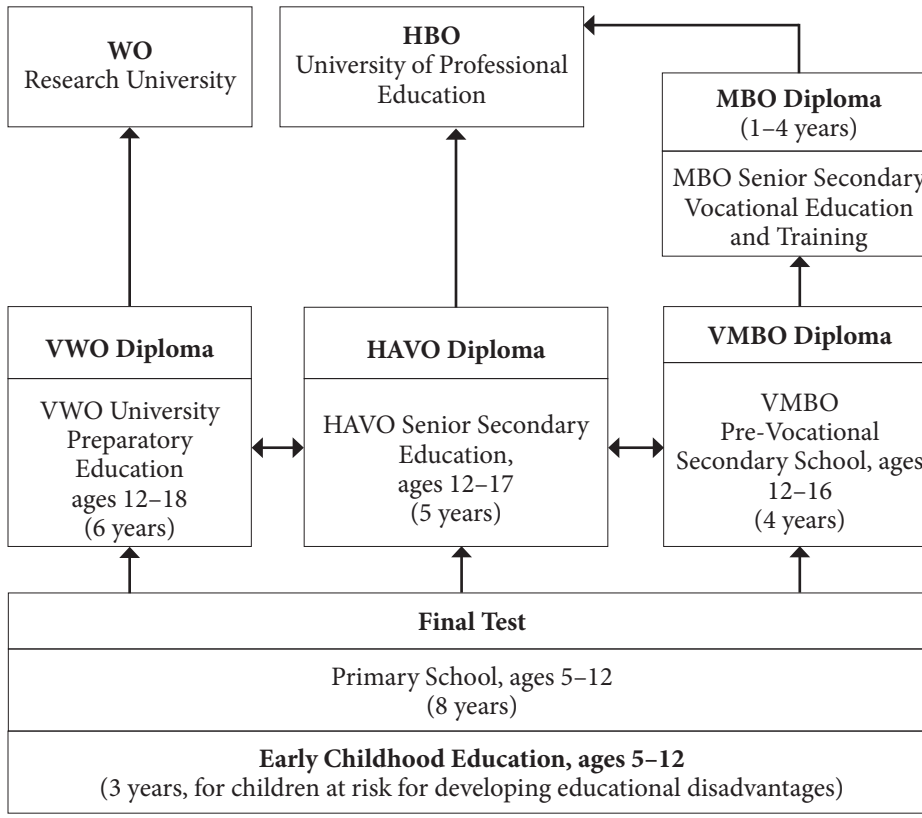

Figure 1. The Netherlands' Education System.

Source: Adapted from: Center on International Education Benchmarking. The Netherlands Overview. Retrieved from: *http://www.ncee.org/programs-affiliates/center-on-international-education-benchmarking/top-performing-countries/netherlands-overview/*

extensive internships with business and industry. Fifty-three percent of students pursue this program. Since 2014–15, to avoid unwanted side effects, such as teaching to the test, teachers' advice for admission to a secondary education track carries more weight than the final test results.

In comparison, the U.S. education system primarily consists of elementary and secondary schools. Prekindergarten and kindergarten are considered to be elementary education. Following this, students spend from 6 to 8 years in elementary school—although some states consider middle school levels to be a separate education level. Students then spend 4 to 6 years in secondary school and generally complete grade 12 by age 18.

Compulsory Attendance

The Netherlands requires compulsory school attendance for children between ages of 5 and 16. School attendance remains compulsory for 16+ students until they are 18 as long as they do not have a sufficient diploma (called 'starting qualification' which is minimally HAVO diploma, VWO diploma or two-year VMBO. The Dutch refer to youth in school between the ages 16 and 18 as compulsory qualification. Compulsory education begins at age 3 for students at risk for developing educational disadvantages. Students could obtain the HAVO diploma by age 17 and the VMBO diploma by age 16, allowing some leeway in the compulsory attendance ages requiring 11, 12, or 13 years of schooling.

In the U.S., compulsory school attendance is a bit more uneven. Table 2 shows the various compulsory attendance ages for the different states. Seven states require 9 years of compulsory education, 14 states require 10 years, 12 states

Table 2. Compulsory Attendance Ages in United States, by State, 2010

Ages 5–16	**Ages 5–17**	**Ages 5–18**	**Ages 6–16**	**Ages 6–17**	**Ages 6–18**	**Ages 7–16**	**Ages 7–17**	**Ages 7–18**	**Ages 8–17**	**Ages 8–18**
DE MD+	AR SC+	CT+ D.C. NM* OK VA*+	AZ* FL GA IA KY MA* NJ NY RI	CO MS NC TN+ WV	CA HI MI NE NH OH SD* TX UT VT* WI	AK*+ ID* MN* MT* ND WY*	AL IL ME* MO	IN KS* LA* NV* OR*	PA*	WA

Source: Digest of Education Statistics, 2012, Table 197, p. 276.
Notes: * Child may be exempted if he/she meets state requirements for early withdrawal with or without meeting conditions for diploma or equivalency.
+ Parents may delay child's entry until later age per state law/regulations

require 11 years, 13 states require 12 years, and 5 states require 13 years. Twenty-one states allow delays in starting or early exits through state regulation. In other words, in the U.S., 21 states require one or two fewer years of schooling than is required in the Netherlands. Compulsory attendance for children requiring special education services exists for all 50 states and D.C.; however, the age range varies from birth to 25 to age 5 to 19 (Snyder and Dillow 2013, Table 197, p. 276).

Required Length of School Year in Weeks, Days, and Hours

The Dutch child's 2014–2015 school year is 207 days (European Commission, 2014). The *Digest of Education Statistics* (Snyder and Dillow 2013, Table 459, p. 671) reports that in 2010, the school year for students in the Netherlands was 40 weeks long, with 195 days of instruction, encompassing 930 hours in elementary grades, and 750 hours in lower and upper secondary schools.

In comparison, U.S. students spend fewer weeks and days in school, but more hours in the classroom. For the 2010 school year, average U.S. students' schooling consisted of 36 weeks, 180 days, encompassing 1,097 hours in elementary grades, 1,068 hours in lower secondary schools, and 1,051 hours in upper secondary schools (Snyder and Dillow 2013, Table 459, p. 671). Interestingly, upon examining the 2011 individual state breakdowns of their minimum instructional days per year, the mode is 180 days. The range, however, is from 160 to 180. The number of hours per year for Kindergarten ranges from 356 to 951, in elementary grades from 720 to 1,116 hours, and in secondary grades from 720 to 1,137 hours (Snyder and Dillow 2013, Table 198, p. 277).

Courses Required to Graduate from Secondary Programs

In the Netherlands, the Ministry of Education, Culture and Science sets the courses required in each of the three secondary tracks. Schools are free to add optional courses established by the Ministry. All students must pass a final exam to graduate from any of the three diploma routes—VWO, HAVO, or VMBO (Center on International Education Benchmarking 2015).

In the U.S., substantial variance exists in course requirements for secondary graduation from state to state. Three states did not report the total Carnegie units required for graduation—Colorado, Massachusetts, and Pennsylvania (Snyder and Dillow 2013, Table 199, p. 278). Of the states reporting, the Carnegie credits required to graduate vary from a low of 13 to a high of 26. In other words, to obtain a diploma, students in California, Iowa, Wisconsin, and Wyoming would be required to take and pass only half the number of classes required in Texas.

Substantial variance exists in the required secondary courses as well. In English/Language Arts, the number of required classes varies from 3 to 4.5. In

Science, and Math, the number of required classes varies from 2 to 4. In Social Studies, the number of required classes varies from .5 to 4. Of the 50 states and the District of Columbia, only 24 require students to pass an exit exam as a graduation requirement; 27 do not have such a requirement. Interestingly, almost one hundred years ago, Ellwood P. Cubberley, the education historian, discussed the evolutionary variance in state's education systems as, "good school conditions, mixed conditions, no action group, and pauper and parochial conditions" (Cubberley 1920). The variance in compulsory attendance ages and required credits for high school graduation rates is current evidence that Cubberley's findings still exist today.

FUNDING

Sources of Funding

In the Netherlands, an overwhelming majority of education funding comes from the national government; some minor funding comes from municipalities (some funding for pre-school programs for children 2½ to 4 years old and for after school enrichment programs for students with educational disadvantage). Some voluntary tuition adds a miniscule part of revenue.

The Dutch place a high value on vertical equity—proactively addressing disadvantages as seen in the achievement gap among different populations (Ladd and Fiske 2011). To address this, the Ministry of Education, Culture and Science adopted a "weighted student funding" (WSF) concept. Each year the Ministry sets a level of base funding for students. To address equity issues, between 1985 and 2006, the Ministry supplied additional funding above base funding for students deemed to have an educational disadvantage. The weightings were as follows (European Agency for Special Needs and Inclusive Information 2015):

- .25 for Dutch pupils whose parents have a low level of education;
- .40 for bargee's children[2];
- .70 for caravan dwellers and gypsies' children; and
- .90 for ethnic minority pupils whose parents have a low level of education

As of August 1, 2006, the Dutch implemented a new system of student weighting. It exists only in primary schools and deals with low parental education. The Ministry of Education, Culture, and Science still sets a per-pupil revenue amount that follows the student. The new weighting factors are (European Agency for Special Needs and Inclusive Information 2015):

- 0.3 for pupils whose parents have no more than lower vocational training/ prevocational training qualifications; and

2. Bargees are individuals who work on the barges in the canals and waterways in the Netherlands.

- 1.2 for pupils who have one parent with only a primary education and one parent with no more than lower vocational training/prevocational training qualifications.

Regulations exist as to how many students must be in a school. To receive the additional weighting factors and additional funds, the threshold of 6% of the students in the school must qualify for the specific weighting.

Technically, per pupil funding follows students to the school. School boards, however, are the legal entities that receive government monies for schools. But Dutch school boards do not operate like U.S. school boards. Ladd and Fiske (2011) point out that Amsterdam has 43 school boards operating between 1 and 16 schools. These boards operate more like Charter School Management Organizations (CMOs), taking a management fee from the school allocations. Ladd and Fisk (2011) further note that in 2006–07, only about 1.7% of the "personnel units" (teaching positions) allocated for the schools they operate were not passed along to the schools and were used for administrative overhead. Currently, the national government does not monitor funding at the building level.

In the U.S. education system, on average, funding comes from federal, state, and local sources. In 2010, the percentages were (Snyder and Dillow 2013, Table 202, p. 282):

- Federal: 12.7%
- State: 43.5%
- Local: 43.8%

Again, our state system of education produces great variance in the average source of funding. Excluding Hawaii and the District of Columbia (that have a unique organization), the range in federal revenue sources varied from a high of 22.1% in North Dakota to a low of 7.3% in Wyoming. The range in state revenue sources varied from a high of 81.6% in Vermont to a low of 29.3% in Missouri. The range in local revenue sources varied from a high of 59.2% in Illinois to a low of 7.8% in Vermont (Snyder and Dillow 2013, Table 203, p. 283). Variations in state and local wealth account for much of the revenue variance.

To address equity issues in the U.S., Title 1 and IDEA funding come from the federal government. According to the U.S. Department of Education, Title 1 funding provides monies to local school districts with high numbers or percentages of children from low-income families to help ensure all children have the resources needed to meet state achievement standards. Similar to the Netherlands, schools must meet a threshold of students qualifying for the funds. In the U.S., the number of children from low-income families at the school must be at least 10% and at least 5% of the school district's school-age population. More than 56,000 public schools used Title 1 funds to serve more than 21 million

students. School districts may use the funds school wide if at least 40% of the students in that school come from low income families. Otherwise, the funds must be targeted to those students who qualify (U.S. Department of Education 2014a).

Some special education funding comes from the federal government to states to assist with extra costs of educating students with special needs. Each state is allocated the amount equal to what was received in FY 1999 with remaining costs allocated to states based on the number of children qualifying for services. Approximately 6.6 million students with special needs were served in FY 2014. State and local funds must make up what is not covered by the federal government (U.S. Department of Education 2014b).

Level of Funding

As we examine the level of funding, the OECD data will be used as they equalize currency to Purchasing Power Parity (PPP) dollars. Table 3 shows the annual expenditures per student for the Netherlands, the U.S., and the OECD average and that level of expenditure relative to GSP per capita in parentheses.

By comparing expenditures equalized for purchasing power and relative to GDP per capita, the amount that each country spends on education as a measure of its wealth—or its fiscal effort for education—becomes clearer.

The Netherlands' spending on education relative to GDP per capita is somewhat lower in pre-primary and primary education than it is in the United States and the OECD average. However, at the lower secondary, upper secondary and all secondary levels, the Netherlands' spending relative to GDP per capita slightly exceeds that of the United States and the OECD averages.

Since the per pupil spending level is set by the Ministry of Education, Culture and Science, virtually no revenue variations exist among Netherlands cities

Table 3. Annual expenditure per student by level of education and expenditure relative to GDP per capita expressed in Purchasing Power Parity (PPP)

Education Level	**The Netherlands**	**The United States**	**OECD Average**
Pre-primary	$8,020 (19)	$10,010 (20)	$7,428 (21)
Primary	$8,036 (19)	$10,958 (22)	$8,296 (23)
Lower Secondary	$12,031 (28)	$12,338 (25)	$9,337 (26)
Upper Secondary	$12,171 (28)	$13,143 (27)	$9,506 (27)
All Secondary	$12,100 (28)	$12,731 (26)	$9,280 (26)

Note: Level of expenditure relative to GDP per capita is in parentheses next to education level. All data are based on 2011 figures.

Source: *Education at a Glance 2014: OECD Indicators,* Table B1.1a, p. 215, and Table B1.4, p. 218. Paris, France: OECD Publishing. Retrieved from: *http://dx.doi.org/10.1787/eag-2014-en.*

and towns except for the additional weighting for disadvantaged children. In contrast, U.S. variation in revenue and per pupil spending is largely based on state and local wealth; these variations can be enormous. Using the average state and local expenditure for determining the state and national mean per pupil expenditures, loses some of the data's robustness. For example, *The Digest of Education Statistics, 2013* reports the average revenue per pupil in the U.S. to be $12,111 (Snyder & Dillow, 2013, Table 202, p. 281). Yet the range of funding is from a low of $7,916 per pupil in Utah to a high of $23,816 per pupil in the District of Columbia.

Intra-district funding appears even more distorted. In New York, for example, 10 districts spend more than $100,000 per pupil and 53 districts spend less than $17,500 (Billmyer 2014). Moreover, many school districts do not track funding at the school level. In fact, some evidence indicates that higher needs U.S. schools are funded to a lower degree than wealthier ones (Owings and Kaplan 2010). The top ten spending New York districts allot more than twice as much per pupil as do the bottom 20 spending districts ($695,371 versus $315,128). This variance raises equity issues that are not seen to such a degree in the Netherlands.

OUTCOMES

Student achievement is a logical education outcome. Outcome measures including literacy rates of 4th graders, as measured by the Progress in International Reading Literacy Study (PIRLS), Trends in International Mathematics and Science Study (TIMSS) scores, Programme for International Student Assessment (PISA) scores, the percentage of the population who have completed high school, and employment-to-population ratios are indicators of student learning and readiness for employment. At the primary level, the Netherlands and the U.S. do not have substantially different outcomes. This may reflect the fact that Dutch and U.S. schooling requirements at that level are not significantly different. Nonetheless, the differences are manifestly obvious at the secondary level. The variance in the states' secondary requirements for graduation—such as compulsory attendance ages, curricula, days and hours of instruction, and funding—may, in part, help explain why the Netherlands' student achievement as measured by standardized test scores exceeds those of U.S. students at the secondary level.

Literacy

We first examined the literacy rates of 4th graders on the PIRLS, which is administered in OECD countries. The scale average is set at 500 with a standard deviation of 100. Table 4 shows the PIRLS scores for the Netherlands and the

Table 4. Fourth grade literacy rates on the PIRLS for Dutch and U.S. students for 2001, 2006, and 2011

Year	The Netherlands	The United States
2001	554	542
2006	547	540
2011	546	556

Note: Average set to 500 with standard deviation of 100
Source: Digest of Education Statistics 2012, Table 462, p. 675

U.S. The two country's scores are virtually identical. If reading is foundational to learning, it appears that Dutch and U.S. students are poised equally well to start.

TIMMS scores

TIMSS scores are reported on a scale of 0 to 1,000 with 500 as average for math and science. The scores represent what students know about subjects compared with students in other countries. As these scores represent learning, it is important to examine the learning time established for math and science in the various countries as the scores are compared.

In the Netherlands, the Ministry of Education, Culture and Science sets the instructional time for 4th grade math and science at 195 and 42 hours per year, respectively. Dutch students' math and science scores on the 4th grade tests are 540 and 531, respectively. In the U.S., each state sets the number of hours of instructional time; they are averaged for the U.S. reporting. Those average times for math and science are 206 hours and 105 hours, respectively. The U.S. scores for math and science are 541 and 544, respectively. Table 5 shows the side-by-side comparison. All scores are above the TIMSS average. By examining the hours of instruction and the scores, the main difference appears to be the science instructional hours in the Netherlands is less than half of U.S. average science

Table 5. Fourth grade TIMSS scores for the Netherlands, the U.S., and the TIMSS average with hours of instruction for math and science and total instructional hours per year

	The Netherlands	The United States	TIMSS Average
Yearly instructional hours	1074	1078	897
Math instructional hours	195	206	162
Science instructional hours	42	105	85
Math score	540	541	500
Science score	531	544	500

Source: Trends in International Mathematics and Science Study, 2012

instructional time. The scores are not measurably different except that U.S. students' science scores are a bit higher than that of Dutch students—possibly due to the instructional hours difference, among other factors. The increased variance of instructional time as seen in Carnegie units required for graduation may be seen as secondary students' data are examined.

The TIMSS is also administered at the 8th grade level; however, scores are not reported for the Netherlands at that grade so comparisons are not possible. The PISA scores, however, are reported for 15 year-olds in the Netherlands and in the U.S. (see Table 6). Like TIMSS, PISA is an international assessment coordinated by OECD that allows countries to compare student learning nearing the end of compulsory attendance age. PISA's goal is to assess students' application of knowledge of math, science, and reading literacy to problems within a real-life context (OECD 1999).

Table 6. PISA scores 15 year olds in the Netherlands, the U.S., and the OECD average

	The Netherlands	The United States	OECD Average
Math score	523	481	494
Reading score	511	498	496
Science score	522	497	501

Source: OECD (2012). *PISA 2012 results in focus: What 15-year-olds know and what they can do with what they know.* Paris, France: Author, p. 5. Retrieved from: *http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf*

Changes in test scores since 4th grade between U.S. and Dutch students are obvious (Table 6). Where U.S. TIMSS scores at the 4th grade level were equal to or higher than the Netherlands and the OECD average, the PISA scores for U.S. 15 year-olds are just above the OECD average for reading, but below the Netherlands in math, reading, and science. Disaggregating the scores further, low achieving students (scores below level 2) and higher achieving students (scores at level 5 and above) show an increasing gap between Dutch and U.S. student scores. Table 7 displays these results. The Netherlands consistently has a lower percentage of students scoring at level 2 or below and a higher percentage of students scoring at level 5 or higher than does the United States (Kelly, Xie, Nord, Jenkins, Chan, and Kastberg 2013). Lower scoring students are more likely to have increased difficulty in meeting graduation and employment requirements.

Graduation Rates

The graduation rate is a key indicator of school success. Table 8 displays the percentage of the population 25 to 64 years old who have completed high school by age group. The high school completion rate in the Netherlands has been

Table 7. Percentage of 15-year-old students performing below level 2 and at or above level 5 on the PISA mathematics, science, and reading proficiency in the Netherland, the U.S., and the OECD average, 2012

	The Netherlands	The United States	OECD Average
Math below level 2	15	26	23
Math level 5 and above	19	9	13
Reading below level 2	14	17	18
Reading level 5 and above	10	8	8
Science below level 2	13	18	18
Science level 5 and above	12	7	8

Source: Kelly, D., Xie, H., Nord, C.W., Jenkins, F., Chan, J.Y., and Kastberg, D. (2013). *Performance of U.S. 15-Year-Old Students in Mathematics, Science, and Reading Literacy in an International Context: First Look at PISA 2012* (NCES 2014-024). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved [date] from: http://nces.ed. gov/pubsearch.

increasing over the years. This is evident as the age bands are examined. As the age band includes older individuals, the graduation rate is lower. When younger age bands are examined, the graduation rate is higher, indicating an increase in the graduation rate.

In the U.S. graduation rates have been relatively stable over the years. Regardless of the age band, the graduation rate has only fluctuated between 88.3% and 89.6%. In a global economy where other country's graduation rates are increasing, the economic competitiveness among those countries increases.

Employment-to-Population Ratios

The employment-to-population ratios provide a more reliable snapshot of cyclical changes in the labor market as compared to the employment rate that does not include the military or persons who have stopped looking for work—or

Table 8. Percentage of the population 25 to 64 years old who completed high school by age group

Age Group	The Netherlands	The United States
25–64	73.0%	89.0%
25–34	82.7%	88.4%
35–44	77.9%	88.3%
45–54	71.0%	89.6%
55–64	60.8%	89.6%

Source: *Digest of Education Statistics, 2012,* Table 467, p. 683.

dropped out of the labor market (Federal Reserve Bank of San Francisco 2013). Table 9 shows the employment-to-population ratios by level of education for the Netherlands and the United States.

As Table 9 indicates, the Netherlands has a higher employment-to-population ratio in each education level group than does the United States. An important concept to remember when reviewing these statistics is the cost of those persons unemployed in the population. As the tax effort level "pie" can only reach a certain level, the social safety net costs for those not employed may take a larger slice of that pie in the U.S. than in the Netherlands.

Table 9. Employment-to-population ratios by level of education for the Netherlands and the United States

Level of Education	The Netherlands	The United States
All education levels	77.3%	71.2%
Less than high school	61.1%	52.1%
High school graduate	80.0%	67.9%
Associates or higher	87.5%	80.0%

Source: *Digest of Education Statistics, 2012,* Table 475, p. 691.

OBSERVATIONS

Many essential contrasts between U.S. and Netherland education systems and student outcomes are apparent. The Netherlands has a national system of education that reduces the variance in compulsory attendance, curriculum standards, academic standards, and funding. The U.S. has a state-driven system of education that permits significant variance in compulsory attendance, curriculum, academic standards, and funding—especially at the secondary level. The Netherlands tracks students at an early age (with a national exam as a back-up) into vocational, college-bound, university-bound cohorts. By contrast, with the need for all children to meet NCLB expectations for grade-level proficiency, the U.S. may have largely "de-tracked" students for more heterogeneous classrooms. This range of variance in the U.S. education system has a profound impact on our secondary educational outcomes that are not as evident in the Netherlands.

Education costs are lower in the Netherlands than in the U.S. in terms of per pupil spending. However, at the secondary level, the gap narrows. As seen in Table 3, expenditures relative to GDP per capita, the Netherlands' fiscal effort is slightly higher at the secondary level than that of the U.S.

Elementary or primary student achievement in reading and math as measured

by test scores are roughly equivalent between the two countries. Science achievement as measured by test scores are higher in the U.S., which may reflect the greater instructional time devoted to science in U.S. primary grades. Other primary instructional time is roughly equivalent.

Secondary test scores in mathematics and science are higher in the Netherlands than the OECD average and higher than in the U.S. The U.S. test scores in math and science are somewhat lower than the OECD average in these subjects and roughly equivalent in reading. The variance in the percentage of students who score in the low and high range of the secondary tests shows that the Netherlands has a greater percentage of their students scoring in the upper range and fewer in the lower range than does the U.S. In fact, U.S. scores at the low and high range are among the lowest in the OECD countries.

FUNDAMENTAL QUESTIONS

This comparison between U.S. and Dutch education and student outcomes—and related observations—provides the opportunity to look beyond our shores and consider our education system in the larger context. Test scores, employment statistics, and labor force viability are relevant but indirect touchstones for student achievement. Yet, drawing this particular comparison raises several fundamental questions.

As Jean-Jacques Rousseau, the Swiss philosopher noted in 1758, "public education…is one the fundamental roles of a popular or legitimate government" (Rousseau, 1973). The questions are educational and political: since our government requires an educated populace if it is to survive as a democratic republic, what happens to our country if we do not fully educate all children for responsible 21st century citizenship? The questions are educational and economic: if we do not fully develop our human capital in a global economy, what happens to our national (and individual) standard of living? The questions are educational and social: how to provide all students with the resources they need to achieve what we baby boomers achieved—a standard of living better than our/their parents? The questions are political and social: what other aspects of public policy must we address if we are to create more opportunities for all children to receive the education they need? As our education systems are now constituted, do we suffer from educational hegemony or misology? We pose the above for serious, honest discussion.

Let's ramp up the conversation.

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