



NATIONAL CONFERENCE of STATE LEGISLATURES

The Forum for America's Ideas

An Introduction to International Education Comparisons

By Heidi Yim, NCSL Summer Fellow

August 2014

As a result of today's global economy, low-skill workers in high-wage countries such as the United States compete directly with low-skill workers in low-wage countries. Technological advances allowing for the automation of routine jobs have further decreased the demand for low-skill workers and increased the demand for high-skill workers. Shifting demands in the labor market have put pressure on governments to better educate their citizens to be internationally competitive. In other words, education quality no longer can be held solely to national standards, but must be compared internationally. Countries that are improving their education systems are improving their economies.

Many international standards and comparisons in education draw upon data from the Programme for International Student Assessment (PISA). This survey by the Organisation for Economic Co-operation and Development (OECD) aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students in more than 70 economies. The assessment, administered once every three years, rotates emphasis between the core subjects of reading, math and science.

	Mean Score in PISA 2012		
	Math	Reading	Science
Shanghai-China	613	570	580
Singapore	573	542	551
Korea	554	536	538
Japan	536	538	547
Netherlands	523	511	522
Finland	519	524	545
Canada	518	523	525
Belgium	515	509	505
Germany	514	508	524
Australia	504	512	521
OECD Average	494	496	501
United States	481	498	497
Chile	423	441	445
Mexico	413	424	415

Source: PISA 2012 Results in Focus

PISA aims to measure students' abilities to apply their knowledge to real-life situations. The students and their school principals also complete questionnaires to provide context that can help analysts interpret the results. Since the test is triennial, it is also possible to compare student performance over time. While PISA cannot measure the quality of an education system or identify causal relationships between the various factors and results of education, it does provide a platform to compare successes in educational systems and achievement across nations. By analyzing the educational policies of top-performing countries, the United States can identify ways to improve its own education system.

Critics of international benchmarking believe that cultural bias, inaccurate assessment methodology, and differences in ethnic homogeneity render the results of PISA irrelevant. Furthermore, since the United States remains the world leader in innovation and

creativity despite its low PISA scores, critics believe the test must not measure these traits.

Nonetheless, it can be valuable to analyze the shared traits of top-performing nations' education systems in order to understand fundamental principles that might be applicable for the states. This brief summarizes some of the most important strategies employed by high-performing countries to provide inspiration for states that are considering important policies for improving student achievements.

Teachers and Teaching

Table 2. Ratio of Lower Secondary Education Teachers' Salary to GDP per capita (2008)

	Initial	After 15 Years	Maximum
Singapore	0.98	1.97	*
Korea	1.23	2.13	3.42
Japan	0.88	1.55	1.96
Finland	0.97	1.22	1.53
Canada	1.2	*	*
Australia	0.92	1.3	1.3
US	0.84	1.02	1.26
OECD	1	1.37	1.65

*Data unavailable

Source: Center on International Education Benchmarking

In many of the top-performing countries, teachers are treated as professionals equivalent in status to doctors and lawyers. Not only do these countries display historical respect toward teaching and teachers, but many also offer top salaries and benefits to their teachers. Top-performing nations recruit potential teachers from the top 30 percent of high school graduates: Singapore recruits from the top 30 percent Finland from the top 20 percent and South Korea recruits its primary school teachers from the top 5 percent of high school graduates.¹ In Finland, although the salary is not as competitive as in other top-performing countries, only one in 10 applicants is accepted into the prestigious teaching programs. In contrast, only 23 percent of U.S. teachers come

from the top 30 percent—and in high poverty schools, this number is only 14 percent.

Research consistently shows that teacher quality is the single most influential factor in school performance. Education systems of top-performing countries fundamentally demonstrate that the quality of an education system ultimately depends upon the quality of its teachers.²

A look at Singapore

Today, it is considered an honor to be a teacher in Singapore, but this wasn't always the case. Forty years ago, Singapore's education level was similar to that of most developing countries. A series of deliberate policy actions dating from the 1990s onward, however, led to development of Singapore's comprehensive system of selecting and developing its teachers and principals.

¹ Auguste, B., et al., *Closing the talent gap: Attracting and retaining top-third graduates to careers in teaching* (McKinsey & Company, September 2010),

http://www.mckinseysociety.com/downloads/reports/Education/Closing_the_talent_gap.pdf.

² *How the world's best-performing school systems come out on top* (SMHC-CPRE, September 2007),

<http://www.smhc-cpre.org/wp-content/uploads/2008/07/how-the-worlds-best-performing-school-systems-come-out-on-top-sept-072.pdf>.

Prospective teachers are selected from the top 30 percent of the secondary school graduating class by panels that include current principals. Teachers receive a monthly stipend competitive with the monthly salary for recent graduates in other occupations as observed by the Ministry of Education.

All teachers also receive training in the Singapore curriculum at the National Institute of Education (NIE). NIE has a close working relationship with the schools, where new teachers are mentored for the first few years. Since the program's focus is designed with teachers in mind rather than to suit to interests of various academic departments, there are no conflicting priorities between arts and sciences and education faculties.

Teaching is considered to be a 12-month profession, with both retention and performance bonuses available for certain teachers. Teachers are allotted 100 hours of professional development (largely school-based) per year so they can constantly improve their practice. Every school has a fund to support teacher growth, which may include study abroad to learn about various aspects of education in other countries. Peer-to-peer learning also is promoted through teacher networks and professional learning communities.

Teachers' performances are appraised annually against 16 competencies, which include contribution to academic and character development of students, collaboration with parents and community groups, and contribution to colleagues and the school as a whole. Although teacher salaries do not increase much over time, many opportunities exist for advancement. After three years of teaching, teachers are assessed annually to see which of three career paths— master teacher, specialist in curriculum, or research or school leader would best suit them.

Singapore first selects, then trains and supports its teachers. Since the system fosters early selectivity and accountability, there is little attrition and few ineffective teachers and principals.

Funding and Resources

In the United States, 14.8 percent of the variation in student performance is explained by students' socio-economic backgrounds, the same as the OECD average.³ This value is not a measure of the quantity of disadvantaged students within a nation, but instead is a measure of how powerful poverty is in determining education success or failure. With the exception of Shanghai, Chinese Taipei and a few European nations, top-performing countries tend to have lower variation. In Australia, socio-economic background accounts for 12.3 percent of the variation; in South Korea, 10.1 percent; in Japan, 9.8 percent; and in Finland and Canada, 9.4 percent.

One explanation for the lesser effect of socio-economic background on education performance may be the more centralized systems of funding. In Australia, 75 percent of school funding comes from the state, while the remaining 25 percent is provided by the federal government. In South Korea, 80 percent of local school district funding comes from the central Ministry of Education, Science and Technology. Japan's school funding comes from a combination of national, municipal and prefectural governments, and funding from Finland's federal government accounts for 57 percent of

³ OECD, *PISA 2012 Results: Excellence through Equity* (Paris: OECD Publishing, 2013), <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-II.pdf>.

school funding there. Canadian provincial governments have funded schools for the past 20 years, and now provide 90 percent of local school funding.

Funding for U.S. public education averages 44.5 percent local, 45.5 percent state, and 10 percent federal. State funding varies significantly, however. New Hampshire school funding is 57.5 percent local, 36.0 percent state and 6.5 percent federal, while Hawaii school funding is 2.2 percent local, 85.2 percent state and 12.6 percent federal.⁴

In many states, a significant component of local funding comes from property taxes. As a result of the property tax, many high-income communities can collect more taxes than low-income communities, where property values can be significantly lower. Some critics of local funding believe this situation creates inequity in the education system, because school funding is determined by the wealth of the local tax base rather than by student need.

A look at Alberta, Canada

The Canadian education finance system shares certain characteristics with that of the United States. In both nations, the national understanding is that, since the federal government cannot appropriately act on local education needs, it therefore should not be charged with managing the system. Canada's system was similar; public schools were largely funded by property taxes. However, the Canadian provinces have undertaken significant reforms since the 1990s, with the aim to create equitable funding for students regardless of where they live.

To allow for such equitable funding, Alberta's minister of education determines each school board's education operating budget, using the province's allocation formula, which accounts for grade level, type and number of course credits; the socioeconomic status of the student population; additional needs of English language learners; and any other variations. School boards receive their funding allotments in accordance with this budget from a combination of property taxes and general provincial revenues.

Alberta's provincial government is authorized to levy taxes for school purposes; the lieutenant governor in council sets the property tax rate for the entire province to centralize supervision of property taxes. The revenue from this tax goes to the province instead of the local school board, via the Alberta School Foundation Fund (ASFF). The ASFF distributes the funds to each school board on a per-pupil basis. Alberta's general revenue fund then meets the remainder of the school districts' operating budgets.

Alberta's reforms did not completely revoke the choice of schools and local communities to directly fund their districts. "Separate schools"—many of which have religious affiliations—choose not to receive funds from the ASFF and, instead, raise money locally, perhaps through its religious constituents. To ensure the fairness of this choice, Alberta adds to school funds if enough money is not collected to meet the education operating budget.

With a few exceptions, school boards also are not required to spend the money it receives for a given category only on that category. Boards also can still raise money locally through fundraising

⁴ Calculated from data from the 2012 Annual Survey of School System Finances, U.S. Census Bureau.

and fees, but such additional funds are capped so as to not undermine the broader equity principles of the reformed funding system.⁵

Governance

In the United States, the federal government plays a supportive role in education governance, which ultimately is the responsibility of the individual states which, in turn, delegate much of this responsibility to local school districts and other agencies. In general, top-performing nations have a level or agency of government that clearly has responsibility, legitimacy and authority to coordinate education policy as a whole. This is true regardless of whether the governance of education is centralized or decentralized.

The federal Ministry of Education, Culture and Science in the Netherlands, for example, is directly responsible for many aspects of education, including creating policy directives; deciding length and frequency of courses; setting the class size norm; creating examination syllabi and national exams and qualification standards; setting teacher salaries, hours and status; and providing all funding for schools as block grants. South Korea and Japan have centralized forms of governance to both produce and fund major policy initiatives. Both nations have linear and hierarchical systems—their respective ministries set policy and curriculum, create accountability measures, allocate funding to lower levels of government, and set teacher and administrator pay scales. While Finland’s national Ministry of Education and Culture technically is responsible for overseeing all publicly funded education, the nation largely places education governance in the hands of the teachers themselves.⁶

Singapore’s system, although similar to Korea’s and Japan’s, is unique because of its streamlined teacher advancement policies and its “autonomous” schools. “Autonomous” schools are high-performing institutions within a locality that are given greater responsibility for governance in that they are allowed to choose some staff and set admissions policies.

A look at Australia

Education in Australia is primarily the responsibility of six states and two territories, each of which has its own ministry of education. In addition, Australia has found a way to build some beneficial aspects of centralized education governance without actually centralizing it. Instead of either the federal government or the states having total control over education governance, both together develop and implement new policies. This was made possible by a variety of agencies created by the various governments, including the Australian Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA); the Ministerial Council for Tertiary Education and Employment (MCTEE); the Standing Council on School Education and Early Childhood; and the Australian Education, Early Childhood Development and Youth Affairs Senior Officials Committee (AEEYSOC).

MCEETYA brings together ministers for education, vocational education, employment and training, and youth services to discuss and develop policies. In 2009, MCTEE was added to execute these

⁵ Herman, J., *Canada’s Approach to School Funding*, (Washington, D.C.: American Progress, May 2013).

⁶ Center on International Education Benchmarking, *Top Performing Countries* (Washington, D.C.), <http://www.ncee.org/programs-affiliates/center-on-international-education-benchmarking/top-performing-countries/>.

policies. One product of MCEETYA and MCTEE is the Melbourne Declaration, which provides a clear set of goals agreed upon by all coalition participants.

The Standing Council on School Education and Early Childhood focused on primary and secondary education, early childhood education, and youth policy. It is charged with coordinating development of strategic policy in these areas, negotiation and development of national agreements on shared objectives and interests, and sharing information and the collaborative use of resources. State and national education authorities on this committee meet to jointly develop national education policy. Meanwhile, AEEYSOC is composed of the senior executives of the national and state education systems. On this committee, chief state school officers and the national authority on education are held responsible for implementing Standing Council policies.

Another agency, the Australian Institute for Teaching and School Leadership (AITSL) was created to improve the quality of Australian teachers and school leaders. Funded and owned by the Australian government, the AITSL directed by and acts on behalf of all Australia education ministers at both state and federal levels.

With this governing structure, Australia has been able to reform education nationally and to successfully coordinate education both between the state and federal levels and among the various education functions.⁷

Testing and Assessments

Although schools and teachers create their own tests in most education systems, the United States is unique in the amount and purpose of mandatory external testing. Top-performing nations commonly require gateway exams that allow students to move on to the next phase of education, and tests are more often used to determine student placement or to monitor student and school progress. In the United States, however, tests are held almost every year and are used to hold schools and teachers accountable. Although top-performing nations test less frequently than the United States, they tend to test a wider range of subjects.⁸

A look at Finland

Finland holds no required external assessments throughout primary and secondary school, but offers an optional National Matriculation Exam at the end of upper secondary school. Sample diagnostic tests are conducted in grades six and nine, and teachers are encouraged to regularly assess their students following the guidelines provided in the national core curriculum. Students also are encouraged to self-assess so they can understand their strengths and design learning activities to address their needs.

Although the National Matriculation Exam is optional because of students' legal right to proceed to the next level of education upon completion of the previous level, most students who wish to continue higher education choose to take it. The exam, which covers four areas, is based on problem-solving skills rather than subject mastery. Students must take the exam in their mother

⁷ Tucker, M., *Governing American Education: Why This Dry Subject May Hold the Key to Advances in American Education*, (Washington, D.C.: NCEE, May 2013).

⁸ Kraemer, J., *Statistic of the Month: When High-Performing Countries Test Students*, (Washington, D.C.: CIEB, April 2014), <http://www.ncee.org/2014/04/statistic-of-the-month-when-high-performing-countries-test-students/>.

tongue, but can choose between second national language, foreign language, mathematics, and sciences and humanities for the remaining three areas. The languages and mathematics areas have basic and advanced. Students can choose the level for each area but must take at least one advanced level. The results of the test may affect student placement in some national institutes of higher education.

Class Size and Structure

The United States is one of the top spenders in education globally. In particular, the United States places significant resources in education capital— most notably with the intent to keep class sizes small. With an average class size of 24 students in 2009, the United States contrasts to top-performing nations in East Asia, such as Shanghai (39), Japan (37), and Korea (36).⁹

Small class size has been considered to provide an overall better classroom experience; lower student-teacher ratios mean more focused, one-on-one attention for each student and a reduced workload for the teacher. Although research shows that smaller classes are beneficial to younger students in primary school and to socioeconomically disadvantaged students, the overall relationship between class size and school performance is weak.¹⁰ More significant to school performance is the amount of class time devoted to teaching and learning, which is affected by how much support teachers are given to address disciplinary issues in the classroom, among various other factors.

A look at Japan

Even with a class of 37 average 15-year-olds, Japanese teachers in primary and lower secondary schools rarely lecture. Classes are more commonly split into small groups, and all students work on the same task. Students are expected to learn by doing things themselves or by watching their peers, instead of by completing drills or listening to lectures.

Both incorrect and correct answers are highlighted, with the understanding that students can better understand the material by seeing both. Students who struggle with material can better understand concepts by watching their classmates. Teachers also frequently team-teach, which allows different teachers to focus on different ability levels within the same lesson.

The large class size also encourages students to develop a sense of self in a group setting. Every Japanese student has a homeroom, which becomes that student's family in the school, and Japanese teachers introduce techniques and skills that allow students to function effectively in a group from the first day of primary school. Responsibility for classroom discipline and management is not solely the teacher's burden, but is shared by the class through the rotating role of class leader.

Particularly in regard to class size, the various aspects of an education system can be a reflection of social, cultural and organizational factors that exist in various countries.¹¹ Japanese students can spend more time engaging in classroom activities because they are expected to run drills outside of class, at home or in "cram schools." As a result of Japan's emphasis on group orientation, students

⁹ OECD, *Education at a Glance 2011: OECD Indicators* (Paris: OECD Publishing, 2011), <http://dx.doi.org/10.1787/eag-2011-en>.

¹⁰ Ibid.

¹¹ *Education Indicators: An International Perspective – Class size in the United States and Japan*, (National Center for Education Statistics), <http://nces.ed.gov/pubs/eiip/eiip21s1.asp>.

are consistently and strategically taught not only to be responsible for themselves, but also for each other. This, in turn, allows teacher to effectively oversee a larger class without the need to deal with disciplinary issues.

School Choice

Although charter schools are often the first consideration in relation to school choice, they are the unique product of the American education system and cannot be so easily compared internationally. In the United States, charter schools are publicly funded, independently operated, and must meet the same academic standards as other public schools. Charter schools operate temporarily; reauthorization usually is required every five to 10 years.

More comparable across various nations is private school choice (largely represented by school vouchers in the United States), but even this is difficult to consider since most disparities in international private school choice options are due to the differing histories of each nation's education system.

In the United States, individual states began to adopt school choice policies in the early 1990s for a variety of reasons, including a desire to close the achievement gap and a belief that parents should have the right to choose the school their children attend. In many other countries, however, private school choice was built into the education system from the beginning. This was possible in nations that had an initial education system composed entirely of private—often religious—schools. Many of these nations implemented a public school system by offering subsidies for private school admission to the general public. Thus, while school choice exists in countries other than the United States, different historical and cultural values and different types may apply. In general, top-performing countries offer school choice in the form of government-funded private school choice programs, and all participating private schools are regulated or held accountable in some manner.

Canada has private school choice nationwide, along with charter schools in the Province of Alberta, and most of these schools receive at least some government funding. Charter schools, while independently operated, are subject to more government oversight than private schools and are entirely publicly funded. In Australia, 31 percent of students are enrolled in private schools, which are required to meet federal education standards and receive some state and federal government.

In the Netherlands, all schools are funded equally if certain regulations are met, whether the school is public or independent (private). Private schools make up two-thirds of government-funded schools, and 76 percent of students attend private schools with public funding. These schools usually have religious or philosophical affiliations. The few private schools in Finland are given the same government funds as public schools and are held to the same standards as public schools.

Private schools in South Korea are primarily funded privately but also receive a small amount of government funding and subsidies. The Japanese government provides capital grants to private

schools and pays 50 percent of private school teachers' salaries. Private schools in Singapore receive no government funding but are held to the same curriculum and assessments as public schools.¹²

A look at Flemish Belgium

The Belgian Constitution includes the right of “freedom of education” —while school is compulsory for all children age six to 18, it also is free. “Freedom of education” in Belgium also means that any natural or legal citizen can start a school and, under the “freedom of organization,” each school is permitted to develop its own education policies from curriculum to teacher selection. Schools are financed and regulated by one of three communities: Flemish-, French- and German-speaking.

Regardless of whether a school is publicly or privately operated, the Flemish government requires it to be “recognized” in order to be eligible to award official certificates and diplomas. There are further requirements for recognized schools to receive public funding, and not all schools choose to meet these requirements. The two major conditions for public funding from the Flemish government are that 1) the school must follow the Flemish core curriculum and 2) the school must allow the Flemish Inspectorate to ensure the school’s quality.

School choice also appears under the Flemish constitution’s “freedom of education,” which gives parents the right to choose a school for their children. This not only requires schools to be accountable to parents, but also offers the potential for competition among schools. Most Flemish students attend recognized institutions that are publicly funded and privately operated. In the 2006-2007 school year, 68.28 percent of students (about 60 percent in primary education and 75 percent in secondary education) attended subsidized, privately operated schools.¹³ Most of these schools are affiliated with the Catholic or Protestant religious denominations, but some schools instead are affiliated with a particular education method.¹⁴

Early Childhood Education and Care

Availability and support of early childhood education and care (ECEC) are growing quickly in high-performing countries. This is aligned with research that shows students who have attended pre-primary education programs tend to perform better than students who have not. Longer duration of pre-primary education, smaller student-teacher ratios, and higher

Table 3. Enrollment rates (%) in early childhood and primary education (2011)

	Age 3	Age 4	Age 5
Australia	13	67	98
Belgium	98	99	99
Canada*	1	48	92
Chile	42	77	87
Finland	49	57	67
Germany**	90	96	97
Japan	77	93	97
Korea	82	83	86
Mexico	44	100	100
Netherlands	87	100	100
OECD	67	84	94
United States	50	78	83
*Year of reference 2010			
**Year of reference 2006			
Source: <i>Education at a Glance 2013</i>			

¹² *Are participating private schools held accountable?*, (The Friedman Foundation for Educational Choice), <http://www.edchoice.org/getattachment/School-Choice/School-Choice-FAQs/Are-participating-private-schools-held-accountable.pdf>.

¹³ *Education in Flanders: The Flemish educational landscape in a nutshell*, (Belgium: Flemish Ministry of Education and Training, November 2008)

¹⁴ Shewbridge, C., et. al., *School Evaluation in the Flemish Community of Belgium 2011*, (Paris: OECD Publishing, 2011), <http://www.oecd.org/edu/school/49177679.pdf>.

public expenditure per child all enhance the positive effects of participation in such programs. Top-performing OECD countries have either national available education-only programs or integrated programs, which include both education and child care services. Teachers in these programs usually are qualified and follow a formal curriculum.

Some nations— particularly in the EU— have made access to pre-primary education almost universal for all 3-year-olds, while others have similar plans: China aims to introduce universal preschool education by 2020,¹⁵ and South Korea aims to provide a new public preschool system for children ages 3 to 5, along with at least one year of free education to all children who are age 5.¹⁶ Singapore recently created the Early Childhood and Development Agency (ECDA) to oversee all aspects—including kindergarten and child care centers— of the development of children younger than age 6.¹⁷

On average in OECD nations, 67 percent of children age 3 or younger are enrolled in early childhood education. In general, top-performing nations tend to have higher participation rates in ECEC programs at earlier ages. Exceptions such as Australia, Canada and Finland represent the difficulty of distinguishing between early childhood education and early child care. For example, low participation rates in “early childhood education” in Finland may be a reflection of high participation rates in Finland’s high-quality “early child care” programs. In contrast, universal participation rates at or below age 5 in countries such as Mexico and the Netherlands reflect a national early compulsory education age.

A look at Germany

As a federal system, many of Germany’s ECEC programs are run by the 16 state governments. With the Child and Youth Welfare Act (KJHG), the federal government provided a legal framework for early childhood services to address the rising demand for educational equity at the earliest ages. KJHG charged all *Kinderkrippen* (for children under age 3) and *Kindergarten* (for children age 3 to compulsory schooling age) institutions with encouraging child development and supplementing the child’s upbringing in the family. This includes instruction, education and care for the child to ensure healthy development socially, emotionally, physically and mentally. Education objectives focus on communication of basic skills and development and enrichment of personal resources to help motivate the child to learn.

Concurrently, every child from the age 3 to starting school age has a legal right to day care in a child day care facility. The manner of education and care given to each child is adjusted to the child’s individual situation: age and development stage, linguistic capabilities, interests and life situations, and ethnic origin. Although Germany has achieved near-universal participation in pre-primary school, more than 25 percent of total spending on pre-primary education is provided by private sources. At the same time, the rates of services offered theoretically are based on the needs of the

¹⁵ *Outline of China’s National Plan for Medium and Long-term Education Reform and Development*, (Beijing: Australian Education International, July 2010),

https://www.aei.gov.au/news/newsarchive/2010/documents/china_education_reform_pdf.pdf.

¹⁶ OECD, *Starting Strong II: Early Childhood Education and Care*, (Paris: OECD Publishing, 2006),

<http://www.oecd.org/newsroom/37425999.pdf>.

¹⁷ Early Childhood Development Agency, *About Us*, (Singapore: Government of Singapore, April 2013),

<http://www.ecda.gov.sg/pages/aboutus.aspx>.

children and their families, and the German government offers funds to subsidize ECEC participation.¹⁸

Conclusion

The U.S. education system has significant strengths, but opportunities exist to learn from what top-performing nations have in common. Although it would be impossible to categorically adopt any single method or policy found abroad into the U.S. education system, the systems of nations that show the best PISA results share a few consistent and common themes.

Top-performing countries focus on improving teacher quality through advancing the recruitment pool and providing current teachers with support and professional development opportunities. These countries also seek educational equity when they develop new policies, and cohesively mobilize all the necessary agents of governance to do so. Above all, top-performing nations are committed to steady, long-term improvement over rapid short-term results.

¹⁸ *The Education System in the Federal Republic of Germany 2011/2012*, (Germany: Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Lander in the Federal Republic of Germany, 2013), http://www.kmk.org/fileadmin/doc/Dokumentation/Bildungswesen_en_pdfs/early_childhood.pdf.

References

Cavanagh, Sean. *U.S. Education Pressured by International Comparisons*. Maryland, Education Week, January 2012, <http://www.edweek.org/ew/articles/2012/01/12/16overview.h31.html>.

OECD. *PISA 2012 Results: Excellence Through Equity: Giving Every Student the Chance to Succeed (Volume II)*. Paris: OECD Publishing, 2013.

OECD. *PISA 2012 Results in Focus*. Paris: OECD Publishing, 2013, <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf>.

Schleicher, Andreas. *Comparability Issues in International Educational Comparisons*. Paris, OECD Publishing, <http://www.waxmann.com/fileadmin/media/zusatztexte/postlethwaite/aschleic.pdf>.

Tucker, Mark. *Surpassing Shanghai: An Agenda for American Education Built on the World's Leading Systems*. Washington, D.C.: Harvard Education Press, 2011.